

D. 3.3: Best Practices Guidelines and Tools for Knowledge Transfer and Implementation of Adaptive Water Governance

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Twin2Go Coordinating twinning partnerships towards more
Adaptive governance in river basins

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1 Introduction

1.1 Background and Rationale

Due to the growing recognition worldwide that a great deal of water problems, and particularly those induced by global changes, are rooted in failures to apply good water governance practices, various options for implementation and exchange of best practices that allow governance systems to effectively adapt and respond to such rapid and pervasive changes are widely discussed.

Indeed, diversified domestic laws and institutions in water management in the countries or in the river basins which are under study by Twin2Go is the key, but not sufficient condition for good water governance. Particularly important for its success is the process of functioning of institutions, implementation of their provisions and rules in every-day practice by multiple stakeholders, realisation of concrete strategies and action plans in river basins, as well as overcoming the existing constraints and benefiting from challenging opportunities. Identifying best practices and tools (BP&T) that promote adaptive water governance and participatory Integrated Water Resources Management (IWRM) in river basins worldwide is in the core of our quest. Problems of implementation of innovative BP&T in river basins and know-how and knowledge transfer relate not only to developing countries and transition economies, but to developed countries as well; these problems have a global dimension with tightly integrated regional and local components. How to better transfer such practices across basins, countries and stakeholders and exchange the most appealing options and lessons learned is an important element of our assessment.

The implementation of adaptive and participatory water resources management programmes and strategies in the river basins of the EUWI targeted regions and the up-take of research results from twinning initiatives into every-day management needs not only the direct transfer of best practices and tools across river basins. Capacity building, development of human resources, promoting proactive stakeholder engagement and enhancing local awareness, along with coordination with the relevant authorities, major stakeholder groups and end-users becomes essential for this purpose.

This endeavour creates new opportunities for building international partnerships and expanding cooperation between different groups of countries worldwide in promoting adaptive water

governance. For example, during the recent years there is an emerging trend in BRICS¹ countries that domestic financial resources are becoming increasingly available there for sustainable development and water resource management, while innovative knowledge and practical expertise is becoming a more critical constraint for performance of water governance regimes. New challenges are opened for international cooperation between the European countries and emerging economies in knowledge transfer and learning from each other about adaptive water management options. The transfer of best practices from developed countries to basins in developing regions has direct links to the recent trends in international environmental assistance. Starting from the mid-1990s, not only the share of international environmental aid in official development assistance (ODA) has been decreasing, but its structure has been modified: since then, the share of the water sector is growing, accounting for the major part of international environmental assistance – about 40% of the total. This is expected to continue during the 2010s given the visibility of water issues within the Millennium Development Goals (MDGs) framework providing additional drivers for knowledge and best practices transfer to the developing countries of the four targeted regions.

The current phase of our inquiry is rooted in the Twin2Go triangle “water governance regime – context – performance”, and it focuses now on the next stage of assessment – *context* and *performance* of BP&T in adaptive water governance. It evaluates the implementation process, practices by stakeholders and effectiveness of best practices applied by them. Although the assessment of the latter is not always easy, because certain evidence and practical results gained over time are essential. Existing designs in water governance regimes and their peculiarities in the regions significantly destine the BP&T implementation process. The context – a set of economic, social, political, cultural, environmental and sustainable development frameworks in the regions or in the river basins – affects BP&T application and channels its outcomes. Opportunities and constraints for effective BP&T implementation and knowledge transfer are often rooted in the context specifics and in the so called ‘situational factors’ at national, regional and local levels.

Building on previous Twin2Go results, this phase of the project undertakes the review of best practices and tools in adaptive and participatory water management identified by the twinning projects and by experts from the four targeted regions – Africa, Russia/NIS, South-East Asia, and Latin America. It organises a dialogue, consultations and experience exchange between experts from twinning projects and authorities, stakeholders and end-users in the targeted regions. Four regional best practice workshops brought together a mix of local and international

¹ Twin2Go studies water governance systems in such BRICS countries as Brazil, Russia, India and South Africa.

experts both scientists and practitioners, representing various stakeholders from the regions – government authorities at various levels, river basin organisations, business, civil society, households, non-governmental organisations and international organisations, and also Twin2Go team members to discuss together the best practices, problems of their application in practice, their effectiveness and exchange across basins and countries. Many among the invited experts were those directly engaged in promoting in practice or studying water governance systems and their implementation in river basins. This exchange of lessons from existing every-day practices by stakeholders showed that a diverse set of adaptive water governance options are either considered or are already in place in water basins under survey.

The main outcomes from the current phase of Twin2Go efforts include: *(1) best practices inventory, (2) assessment of opportunities and constraints for best practices application and transfer, (3) development of best practices policy guidelines and learning in adaptive water governance.*

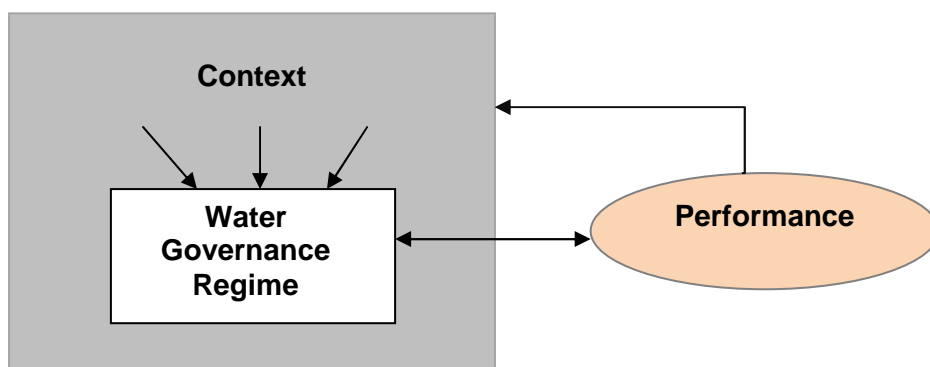
In order to facilitate the compilation of data and best practices analyses of results from other EU twinning projects and additional cases in basins worldwide, the project partners developed a methodology for a Twin2Go inventory of best practices in water governance. It allows analysing properties of best practices implementation and transfer, the socio-economic and natural contexts in basins and countries where they are applied, as well as their performance results (see Deliverable 3.1). Data collection took place in a course of a series of regional best practice workshops for the four targeted regions around the world. The workshops involved researchers and practitioners from these regions (see Deliverable 3.2).

Combined with compilation results from twinning basins by project partners, the Twin2Go inventory contains 48 best practices stories from 26 basins worldwide. The results of comparison and aggregation of assessments from the inventory of best practices served for the development of 15 policy guidelines for decision-makers.

BP&T in water governance, and specifically in adaptive water governance, is the red thread of our assessment. However, we are aware that sometimes while analyzing the performance and implementation process it is difficult to *distinguish* in practice between ‘water governance’ in river basins and ‘adaptive water governance’. Adaptive capacity and potential at various levels of the targeted regions is another point of our interest.

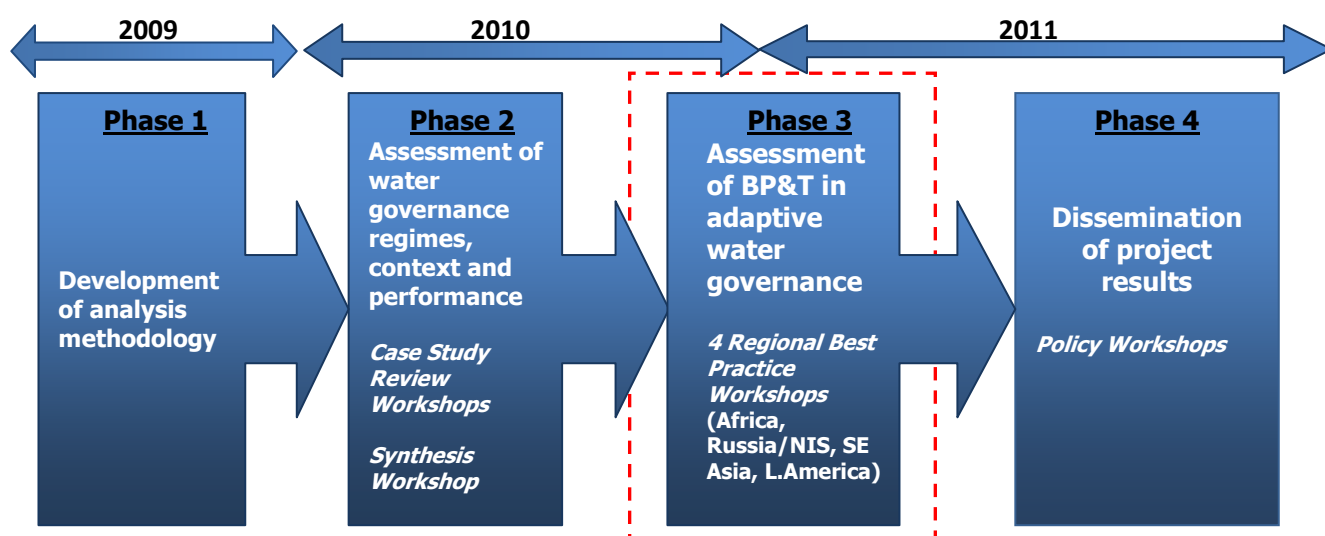
Twin2Go acknowledges the active participation and interest of the invited external experts and appreciates their valuable contributions; without their inputs and thoughtful practical guidelines our progress towards the stated project goals would not have been possible.

Figure 1. Essential elements of the Twin2go analytical framework



This report covers activities in phase III of the Twin2Go project (Fig.2). The inventory of Best Practices and Tools (BP&T) in adaptive and integrated water governance is based on data from the twinning projects in river basins and on consultations and data of external experts from four targeted regions. For this purpose a series of four Regional Best Practice Workshops with experts and practitioners were held for: (1) Africa, (2) Russia/NIS, (3) South-East Asia and (4) Latin America.

Figure 2. Flow chart: steps towards the achievement of Twin2Go goals



1.2 Goals

The major goal of the best practices and tools assessment is to identify ***best practices and tools for implementing adaptive water governance and for improving the up-take of research results by relevant authorities, stakeholders and end-users based on experiences, successes and failures in existing projects and initiatives.***

In pursuit of this major goal the following objectives were set:

- Identify innovative Best Practices and Tools (BP&T) being implemented in basins of the four targeted regions, and by the projects in the twinning basins in particular, that potentially contribute to integrated and adaptive water resources management
- Develop a dialogue to promote the exchange of experiences on implementing BP&T with special attention to barriers, opportunities and drivers for the up-take of best practices and knowledge with authorities, stakeholders and end-users in the targeted regions
- Distil lessons learned about the transfer of BP&T across river basins and countries and enhance the uptake of research results on decision-making and practice
- Formulate best practice guidelines and tools for knowledge transfer and implementation of IWRM and adaptive water governance

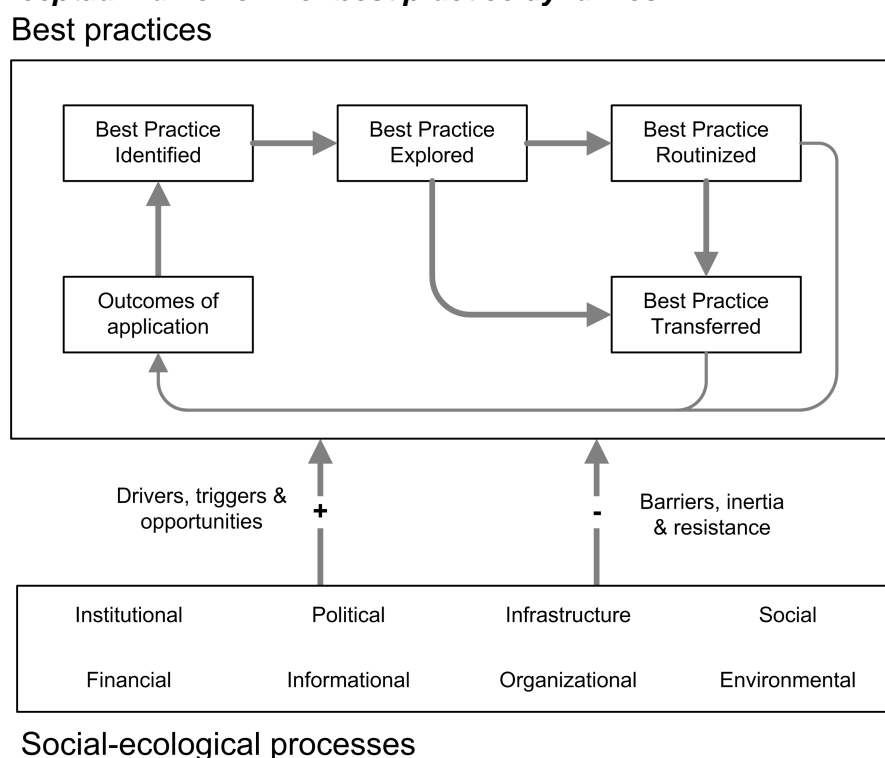
1.3 Conceptual Framework

A **best practice** is a technique, management method, process, activity, incentive, or reward that is believed to be more effective at delivering particular outcome than any other technique, method, etc. when applied to a particular condition or circumstance. Best practices can also be defined as the most efficient (least amount of effort) or effective (best results) way of accomplishing a task, based on repeatable procedures that have proven themselves over time for large numbers of people.

Social-ecological processes influence best practice dynamics from how problems are identified through support received around discourse coalitions and, in some cases, resulting in

investments in and implementation of favoured solutions. Several dimensions can be recognised (Fig. 3).

Figure 3. Conceptual framework for best practice dynamics



Within a variety of best practices in water governance and associated implementation processes currently in place in the four targeted regions and building on results already gained by Twin2Go during previous phases, we decided to concentrate on three major foci in the assessment of BP&T:

Focus 1: application of national water governance frameworks in river basins;

Focus 2: engagement and coordination among actors and forms of interaction/partnerships;

Focus 3: enabling learning and building adaptive capacity in water governance.

What BP&T in water governance are used in the region? How and to what extent do they enhance capacity building, awareness raising, stakeholder participation and partnerships? How does the existing socio-economic and environmental context in the countries and in the basins affect BP&T implementation? What domestic incentives are provided to stakeholders to stimulate application of BP&T? What are the priority goals, interests and capacities of stakeholders in that respect? What are the visions of adaptive strategies in river basins? These and other questions are in the core of our quest.

Transfer of BP&T across countries and across river basins is a cross-cutting theme in our assessment. Why is it not always possible to directly transfer good practices to other river basins and countries? Why their adaptation to local/regional contexts and situational specifics is often needed? How to better adapt them? Why cannot some BP&T be easily adapted? What are the major barriers and constraints to their transfer and adaptation?

1.4 Set of Cases in Basins

The inventory of best practices was carried out in the four targeted regions around the world (Fig. 4), and it resulted, in total, in 48 cases of best practice descriptions from 26 basins in 26 countries (Table 1). It has been compiled by project partners and external experts and is an outcome from consultations in the four regional best practice workshops and prior to those workshops. It serves for further assessment and comparison of best practices implementation across basins. Aggregation of findings from the regions is a basis for the formulation of policy advice and guidelines for decision-makers.

Table 1. Twin2Go inventory of best practices in river basins

No	Region	BP&T Cases	Basins Addressed	Countries
1	Europe	18 ²	7	6
2	Africa	7	5	8
3	South-East Asia	14	6	5
4	Latin America	9	8	7
	TOTAL	48	26	26

² Includes the case of Amu Darya, Uzbekistan from the Twin2Go targeted region Russia/NIS.

Figure 4. Twin2Go Inventory: Best Practices in Water Governance in Four Targeted Regions



Among the important practical outcomes of the current phase of the project is the compilation of the unique dataset - *Twin2Go Best Practices and Tools Inventory*. It contains the compatible qualitative data and results of expert assessment of the fifteen basic parameters for best practices and tools application in water basins³ worldwide. These parameters include, for example, the BP&T rationale, stakeholders-implementers, context for performance with major opportunities and barriers, characteristics of its implementation and effectiveness, and transfer across countries and basins. The inventory of BP&T in water governance is based on expert data and opinion as well as on assessments from twinning projects provided by project partners⁴. It serves as a basis for the development of policy guidelines for decision-makers.

³ The focus is on the national parts of either transborder watersheds, or domestic basins inside a country.

⁴ Data from twinning projects assembled in the table below: No. 14-20; 33-38; 47-48

Table 2. Inventory of Best Practices and Tools (BP&T) in Water Governance

No	BP&T	River Basin/Province/Country	Twin2Go Region
Focus 1: Application of national water frameworks in river basins			
1	Re-profiling of urban riverside territories from industrial to business-administrative sites	Volga/Russia	Russia
2	Relaxation of procedures and removal of administrative barriers in issuing water use permits	Russia	Russia
3	Introduction of integrated river basin management within Amu Darya river basin, Uzbekistan	Amu Darya/ Uzbekistan	NIS
4	Compensation for restoring and maintaining ecosystem services especially in times of food insecurities	Niger river basin	Africa
5	Leveraging national water priorities to support transboundary co-operation	Lake Victoria Basin - Kenya	Africa
6	Irrigated agriculture	Brahmaputra River in Assam/ India	SEA
7	Safe drinking water	Brahmaputra River in Assam/ India	SEA
8	Water quality control in Prachinburi River basin	Prachinburi River basin/ Thailand	SEA
9	Climate Change Adaptation and Disaster Risk Reduction, Bagmati Basin	Bagmati River/ Nepal	SEA
10	Koshi River Basin Management Strategy	Koshi River/ Nepal	SEA
11	Implementing IWRM through RBO in Vietnam	Red River/Vietnam	SEA
12	Integrated and participative planning with socio-environmental focus	Guayas/Ecuador	LAC
13	National strategy for integrated river basin management – pilot initiative for the Baker Basin	Baker/Chile	LAC
14	Increase flood safety in the Hungarian Part of Tisza River Basin, "New Vasarhelyi Plan"	Tisza/Hungary	Europe
15	Water quality improvement in the Hungarian Part of Tisza River Basin	Tisza/Hungary	Europe
16	Delivering sustainable water management in a changing climate	Thames/England	Europe
17	Volga Revival federal program, 1998-2004	Volga/Russia	Europe
18	Implementation of Environmental Code in Sweden	Norrstrom/Sweden	Europe
19	Red River Basin Planning Management Board, RBPMB	Red River/Vietnam	SEA
20	Kosi River Basin Management Strategy, 2007	Brahmaputra/Nepal	SEA
Focus 2: Engagement and coordination among actors, forms of interaction/partnerships			
21	<i>Vetluga river basin: Coordination practices in implementation of basin agreements at the local level (N.Novgorod, Kostroma oblasts, and Mary-El republic)</i>	Vetluga /Nizhegorodskaya oblast,Kostroma oblast,Mari-El republic/ Russia	Russia
22	<i>Implementation of Environmental Development Strategy by Cherepovets Chemical Group FosAgro (Ammophos, Cherepovets Azot, Agro-Cherepovets)</i>	Vologda oblast/ Russia	Russia
23	<i>Introduction of international environmental management system ISO 14001 by industrial enterprise</i>	Vologda oblast/ Russia	Russia
24	<i>Bottom-up approach for stakeholder participation in transboundary river basins</i>	Orange-Senqu river basin/ Botswana, Lesotho, Namibia and South Africa	Africa
25	<i>Early stakeholder mapping for improved operationalization of the Limpopo Agreement</i>	Limpopo river basin/ South Africa, Botswana, Zimbabwe, Mozambique	Africa
26	<i>Participatory water allocation at Bangpakong and Prachinburi River basin</i>	Bangpakong and Prachinburi River basin/ Thailand	SEA
27	<i>Flood control and river bank erosion in Assam</i>	Brahmaputra River in Assam/ India	SEA
28	<i>Hydropower in Assam</i>	Brahmaputra River in Assam/ India	SEA
29	<i>A "grassroots" initiative creating a River Basin Committee for the Brazilian part of the Quarai-Cuareim Basin</i>	Quarai/Brazil	LAC
30	<i>Joint Public-Private A partnership for Water Quality Modelling, arising from international cooperation and given continuity & sustainability by means of a Public-Private Partnership</i>	Biobio/Chile	LAC
31	<i>Participative preparation of a Territorial Planning, Development and Management Plan for the Binational Basin</i>	Catamayo-Chira/Ecuador-Peru	LAC

32	<i>Multi-sectoral collective environmental diagnostic for the Basin</i>	Alto Cauca/Colombia	LAC
33	<i>Lukoil corporate strategy on environmental security</i>	Volga/Russia	Europe
34	<i>Stakeholder involvement beyond level required by law, Wuppertalverband</i>	Dhunn (Rhine basin)/Germany	Europe
35	<i>Stakeholders inspire river management, "New Vasarhelyi Plan"</i>	Tisza/Hungary	Europe
36	<i>Bottom-up learning: Stakeholder assemble knowledge about water management options</i>	Tisza/Hungary	Europe
37	<i>Participatory water allocation in Bang Pakong, "Stimulating participatory process for water allocation in Bang Pakong River Basin " program</i>	Bang Pakong/ Thailand	SE Asia
38	<i>Tala Hydroelectric Project, 1998-2007</i>	Brahmaputra/Bhutan	SE Asia
Focus 3: Enabling learning and building adaptive capacity in water governance			
39	<i>Flood monitoring and forecasting in Nizhegorodskaya oblast, Russia</i>	Volga/ Nizhegorodskaya oblast /Russia	Russia
40	<i>Hydrodynamic GIS modeling of the Volga river basin (Tver-Cheboksay section)</i>	Volga/Russia	Russia
41	<i>Enhancing dissemination of information on water supply of rural areas to decision-makers</i>	Yaroslavl oblast/ Russia	Russia
42	<i>Creating an enabling environment through inclusive and equitable knowledge and capacity building</i>	Orange-Senqu river basin/ Botswana, Lesotho, Namibia and South Africa	Africa
43	<i>Establish initially a research based basin-wide knowledge system to focus the work of the basin commission on real issues and provide a learning process based on the use of the research base and platform established</i>	Okavango river basin/Angola, Botswana, Namibia	Africa
44	<i>Construction of a Transboundary, basin-wide, shared, georeferenced database and modeling application for Decision Support</i>	Quarai-Cuareim/ Brazil, Uruguay	LAC
45	<i>Capacity-building for irrigation canal users</i>	Biobio/Chile	LAC
46	<i>Binational coordinated effort to conduct a diagnostic analysis and participative planning involving all stakeholders</i>	Titicaca /Bolivia	LAC
47	<i>Scenario analysis of hydrology and water resources of the Okavango Delta</i>	Okavango/Botswana	Africa
48	<i>Development/implementation of National Environmental Education Strategy</i>	Brahmaputra/Bhutan	SE Asia

2 Methods

2.1 Identification and Documentation of Best Practices case studies

The Twin2Go inventory of best practices in water governance in river basins worldwide followed the method developed by project partners at the start of WP3 activities.

It was aimed, *first*, at **compilation of data** about best practices by Twin2Go partners from the twinning projects under survey,

- (a) from the results assembled earlier in WP2 according to the Twin2Go Questionnaire in 29 river basins⁵,
- (b) best practice examples provided by Twin2Go partners based on case studies in the twinning projects, and
- (c) new expert data from 22 river basins obtained during the four regional best practice workshops hosted by Twin2Go during the period December 2010 – February 2011 – in Africa, Russia/NIS, South-East Asia and Latin America.
- (d) Furthermore, an overview of best practices in adaptive water management was compiled from guidance documents, reports and databases of international organisations and various initiatives (Annex 8.4)

Second, the data compiled in the best practices inventory was used for further **analysis and assessment** of best practices implementation and transfer. It is based both on expert opinion registered as a result of brain-storming in a course of a series of regional workshops, and also on further analytical work undertaken by Twin2Go.

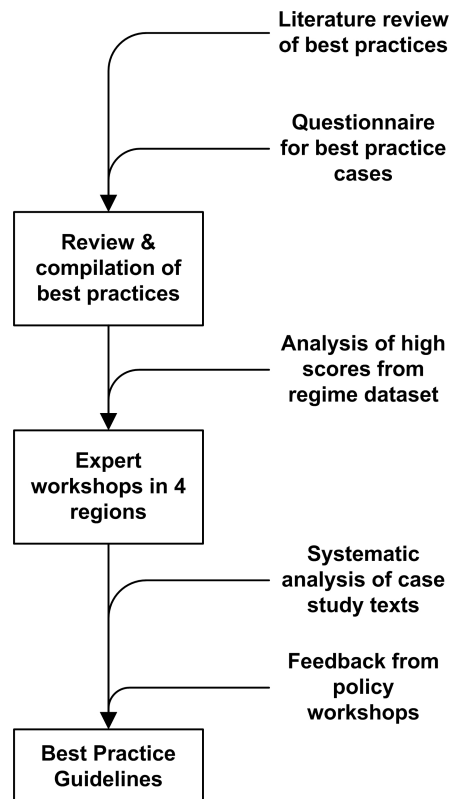
Third, the results of comparison and aggregation of assessments from the inventory of best practices served for the development of **15 policy guidelines** and recommendations with supporting actions for decision-makers that are presented in a special section of this report. Regional experts participating in the series of regional best practice workshops took active part in formulating and discussing the policy guidelines.

The methodology of the Twin2Go inventory includes the following interlinked components (Fig.5), which are presented in this report:

⁵ “A”-Scores analysis of best practices and Inventory of best practices from twinning projects was based on WP2 results, and was undertaken before the start of the series of four regional workshops.

- Four regional best practice workshops
- Coding and analysis of case study documents
- “A” Scores analysis of best practices and tools
- Inventory of best practices from projects in twinning basins
- Policy guidelines

Figure 5. Best Practices: Stepping-stones in Twin2Go inventory and assessment



The following concrete actions were taken to identify and assess the BP&T:

1) Review best practices and innovative tools, possibilities and constraints for their implementation and transfer

- Develop a questionnaire for experts, authorities, stakeholders and end-users building on earlier Twin2Go results
- Develop the Brief on best practices and tools (Deliverable 3.1) to be discussed at the regional workshops and used as basis for the Guidelines
- Undertake 'A'-scores analysis of data provided by Twin2Go questionnaires processed during previous phases (WP2)
- Compile best practices inventory from twinning projects by project partners

2) Organise regional workshops (4) to consolidate results and exchange lessons learned from the EU twinning projects and experts in the targeted regions

- Disseminate Brief among participants
- Prepare the format for the dialogue with experts and brainstorming sessions
- Organize workshops and experience exchange
- Identify major problems in the river basins to be discussed with invited experts during the brainstorming session at the regional workshops
- Compile inventory of best practices, summary messages and recommendations

3) Formulate best practices guidelines and tools for knowledge transfer and implementation of adaptive governance

- Undertake post-workshops analysis of inventories compiled by external experts and project partners
- Aggregate main messages and lessons learned from the twinning projects and consultations with external experts from the regions
- Summarise possibilities and constraints for BP&T implementation and transfer
- Develop policy guidelines on best practices and tools, their transfer and implementation

2.2 Regional Best Practice Workshops

2.2.1 Overview

Twin2Go hosted four regional best practices workshops for Africa, Russia/NIS, South-East Asia and Latin America. A series of regional workshops was organised in parallel according to the common agenda. During the period between December 2010 and February 2011, over seventy invited experts took part in the workshops' brainstorming exercise and provided valuable data and practical advice from 33 examples of best practices that are implemented in 22 basins in 21 countries worldwide (Table 3).

Table 3. Summary for four regional best practice workshops

No	Region	Countries		Basins Addressed		BP&T stories	Workshop participants	Workshop venue
		Number	Name	Number	Name			
1	Africa	8	Angola, Botswana, Kenya, Lesotho, Mozambique, Namibia, Zimbabwe, South Africa	5	Limpopo, Niger, Okavango, Orange-Senqu, Victoria lake	6	16	Johannesburg, South Africa 31.01-02.02.2011
2	Russia/NIS	2	Russia, Uzbekistan	3	Amu Darya, Vetluga, Volga	9	18	Berlin, Germany 15-17.01.2011
3	South-East Asia	4	India, Nepal, Thailand, Vietnam	6	Bagmati, Bangpakong, Brahmaputra, Koshi, Prachinburi, Red	9	20	Guwahati, India 17-19.2011
4	Latin America	7	Bolivia, Brazil, Chile, Colombia, Ecuador, Peru, Uruguay	8	Alto Cauca, Baker, Biobio, Catamayo-Chira, Guayas, Quairai, Quairai-Cuareim, Titicaca lake	9	18	Lima, Peru, 9-10.12.2010
Total:		21		22		33	72	

2.2.2 Goals

The four Regional Best Practice Workshops of Twin2Go had three goals:

- Review and synthesise innovative Best Practices and Tools in the implementation of adaptive water governance and participatory IWRM as identified by the twinning projects in river basins of the four targeted regions
- Exchange experiences and lessons learned about the transfer and adaptation of BP&T across river basins and countries
- Develop a dialogue on major problems, possibilities and constraints for the application of BP&T and knowledge with authorities and stakeholders in the region, and identify their interests, needs and capacities in implementing innovative practices in adaptive water governance

These goals were addressed through discussion with the invited external experts from the regions of their practical experiences and stories, through consultations with experts about the inventory and research results learned from the Twin2Go twinning projects and through joint brainstorming in working groups during the workshops. The workshops promoted the dialogue and experience exchange between experts from twinning projects and authorities, stakeholders and end-users in the targeted regions. Exchange of lessons about success and failures in application and dissemination of BP&T, and about how to benefit from opportunities and overcome existing barriers and policy-practice gaps within the implementation process was among the practical outcomes of such interactive dialogue. Key messages relevant for the targeted regions and strategic visions for BP&T dissemination were explored.

2.2.3 Invited experts: participatory dialogue

The four regional best practices workshops brought together a mix of local and international experts, both scientists and practitioners, representing various stakeholders from the regions – government authorities at various levels, river basin organisations, business, civil society, households, non-governmental organisations and international organisations, and also Twin2Go team members to discuss together the best practices, problems of their application in practice, their effectiveness and exchange across basins and countries. Many among the invited experts were those directly engaged in promoting in practice or studying water governance systems and their implementation in river basins. Practitioners with their valuable knowledge and experiences about the application of BP&T and dissemination across countries, river basins and stakeholder groups were encouraged to discuss major lessons learned with decision-makers and scholars. We invited experts to the workshops to engage in new thinking, envision broader possibilities, exchange and identify innovative instruments to expand up-take of knowledge and BP&T in the implementation of adaptive water governance and participatory IWRM.

In order to effectively exchange lessons learned with each other we encouraged experts to bring to the meeting their own stories about BP&T in water governance and to answer 15 questions of the BP&T Inventory questionnaire (see Deliverable 3. 1) to illustrate their case study.

The meetings were conducted under Chatham House rules: there was no attribution of ideas or positions of participating experts during or after the event.

2.2.4 Program and format

The standard program of the four regional best practice workshops includes (see Deliverable 3.1):

Day 1 of each Workshop is dedicated to plenary discussion of Twin2Go assessment of water governance regimes in 29 river basins worldwide and presenting the initial overviews from Inventory of BP&T in water management in the twinning river basins and projects from the region. Dialogue regarding the main messages and consultations with experts, and comparison of findings with the experiences of invited practitioners and scholars is among the tasks. The second half of Day 1 includes the discussion of the core questions, themes and setting the agenda for the brain-storming exercise in the working groups.

Day 2 of the Workshop is dedicated to parallel working group sessions concentrating on the exchange of stories, views and major lessons about (1) application of BP&T in water management and stakeholder roles. (2) Transfer and adaptation of experiences across basins, countries and stakeholder groups is critically explored. International and local experts from research and practice are involved in filling-in the Twin2Go Inventory questionnaires (Form-1), presenting their stories and discussion of (3) summary messages and recommendations for the region (Form-2).

Day 3 of the Workshop includes the presentations the key results of discussions in the working groups, as well as the main messages about success and failures in application of BP&T in water management in river basins. The final plenary session aggregates the findings from expert assessment for the targeted region and identifies the key strategic visions for BP&T in adaptive water governance and lessons learned.

2.2.5 BP&T inventory: Forms and questionnaire

Twin2Go developed a methodological framework for inventory and assessment of best practices in water governance and participatory IWRM, allowing to: 1) compile according to a common format the qualitative data and assessments of BP&T applied in water basins in the four targeted regions, 2) provide a summary of key messages about BP&T implementation in the targeted regions. The formats for *BP&T questionnaire* (Format -1) and *BP&T summary* (Format-2) and an accompanying guidance document (see Deliverable 3.1) serve to compile the Twin2Go BP&T inventory, to compare the key messages from twinning projects and water basins in the four targeted regions and to aggregate major findings about BP&T implementation (Annex 8.1).

The *BP&T Questionnaire* structures and records the expert opinions and data about the implementation of water governance regimes and adaptive practices used for that purpose. It assembles the details of expert stories and examples from the regions, or river basins, or

stakeholder groups about the *application* of BP&T in water governance, about the *context* affecting their use, and about *performance* outcomes. It was sent to invited experts in about two weeks prior to the workshops.

The questionnaire comprises of 15 qualitative questions in four sections: (1) BP&T applied and actors involved, (2) Context for its implementation, (3) Performance and effectiveness, (4) BP&T transfer. The section *BP&T applied* focuses on specific properties of BP&T in basin water governance presented by a particular expert story. It deals with the description and purposes of particular practice, actors involved in its implementation and incentive/enforcement mechanisms applied in its support. The *Context* section serves to examine (a) the opportunities and drivers for BP&T application, and, (b) general societal barriers and limitations attributed to existing water governance systems in the basins and countries. The *Performance and effectiveness* section inquires about (a) the success or failure in BP&T application in a basin, (b) progress towards further development of administrative capacity, (c) changes in behaviour of stakeholders as a result of concrete BP&T application, and (d) its contribution to problem-solving. Finally, the *Transfer* section covers (a) the examples of practices transferred across countries, basins and stakeholder groups, (b) problems of their adaptation to local context, (c) opportunities and barriers for transfer and adaptation, and (d) 'external' influence of donors within this process. In total, 33 questionnaires containing BP&T stories were filled in by the invited experts from the four targeted regions (see Deliverable 3.2).

The *BP&T summary* registers the key messages from expert stories discussed during the workshops. The aggregated data and BP&T examples are structured according to the three major foci:

- application of national water governance frameworks in river basins,
- engagement and coordination among actors and forms of interaction/partnerships,
- enabling learning and building adaptive capacity in water governance.

Within each focus the key messages about BP&T application, context (opportunities, barriers), performance (success stories, problems encountered) are crystallised. The BP&T transfer section is cross-cutting, and registers the key messages about dissemination and up-take. Possible options and constraints for the transfer and adaptation of BP&T across countries, river basins or stakeholder groups are assessed. Recommendations and expert opinions how to better implement BP&T and exchange them are registered. The ultimate goal is to identify BP&T that lead to, or otherwise enhance, adaptive water governance under climate change. Stories of experts from the four targeted regions and examples of BP&T discussed in the working groups

during the workshops (Annex 8.2), along with the key messages and lessons learned were recorded in the summary tables (see Deliverable 3.2).

2.2.6 Synthesis of BP&T results

Aggregation of findings from expert assessment for the targeted region, identifying the key strategic visions for BP&T in adaptive water governance and participatory IWRM, and lessons learned was the subject for the final plenary discussion during each regional workshop. In particular it concentrated on major messages from the working group sessions about: 1) lessons learned from experts' stories on the application of BP&T; 2) stakeholder roles; 3) specifics in socio-economic context (barriers and drivers) for BP&T application; 4) opportunities and constraints for BP&T transfer across countries, river basins and stakeholder groups; 5) core challenges for the region and recommendations for problem-solving. They were used as a basis for the follow-up analysis by Twin2Go and for the development of policy guidelines.

The BP&T questionnaire and BP&T summary served to collect data and to enable consultations with experts from various basins during the four regional best practices workshops. After the workshops series, Twin2Go undertook analyses of the data collected. Comparative analyses with further aggregation of findings aimed at the formulation of policy guidelines with supporting recommendations and actions for decision-makers about the application and transfer of BP&T in river basins in the four targeted regions.

All results of the four regional best practice workshops were aggregated and used by Twin2Go to formulate best practice guidelines and tools for knowledge transfer and implementation of adaptive governance and participatory IWRM in river basins worldwide. On the basis of the regional workshops, Twin2Go envisioned to support and expand the international expert networks and cooperation between them.

All papers and results are made available for the wide public. These are downloaded at the Twin2Go website (<http://www.twin2go.uos.de/approach/work-package-3>).

2.3 Dataset Coding and Analysis of Case Study Documents

This section overviews a rapid but systematic analysis of the best practices dataset using qualitative coding techniques in the software NVIVO (Annex 8.3). Only information provided in the inventory sheets has been used in this first version of the analysis – in other words, there

has been no cross-validation with published literature or integration with reviews and recommendations of best practices, and all cases nominated by participants as examples of efforts to implement best practices have been included.

This study is based on the analysis of 47 documents as follows: four extracts of discussion summaries and recommendations from regional workshop reports (Russia/NIS, SE Asia, Africa, and Latin America) and 43 best practice descriptions. In the results section of this report the specific cases supporting a statement are given in parenthesis.

Coding with NVIVO software involves scanning text on the screen and highlighting clauses or paragraphs that are about a particular topic. Codes can overlap. New codes can be created as you go but we started with an initial logical but fairly simple structure of higher-level codes

Coding and analysis was done in four main steps:

In the *first* pass through text questions in the inventory questionnaire categories were used to break up text into similar sections, for example, about reasons, or opportunities and drivers. Text obviously placed under wrong heading was reclassified.

In the *second* pass broad categories like “how applied” and “reasons” and “opportunities & drivers” were further subdivided. In some cases similar rare categories were later re-aggregated, but rare distinct categories were maintained.

In the *third* pass lower codes were grouped without aggregation. In exploring ‘barriers and constraints’, ‘opportunities and drivers’ and the best practices themselves, for example, it was found useful to group codes against the eight dimensions of social-ecological processes as per the conceptual framework as one way of organizing the analysis.

In the *fourth* step other analytical categories were explored around ideas of “discourses” and “coalitions”, as these were also part of initial framing for how best practices might be adopted and spread. These codings often cut across other sections.

The codes were then used for interpretive analysis as reported below. Different types of activities were identified and their rough frequency considered. This allowed for semi-quantitative analysis at levels like: predominant, common and rare. Illustrative quotes were also extracted.

2.4 Inventory of Best Practices from Projects in Twinning Basins

The inventory of best practices from the twinning projects and case-studies has been compiled by Twin2Go project partners (Annex 8.5) as a test run for the method applied later in the expert assessments during the series of four regional workshops. As a result, the data compilation and assessment of 15 best practices in nine river basins in nine countries worldwide were undertaken (Table 4). They comprise the integral part of the Twin2Go best practices inventory.

Table 4. Inventory of best practices by partners from case study basins and twinning projects

No.	BP&T	River basin/Country	Region	Twin Project
Focus 1: Application of national water frameworks in river basins				
1	Increase flood safety in the Hungarian Part of Tisza River Basin, "New Vasarhelyi Plan"	Tisza/Hungary	Europe	Twin2Go
2	Water quality improvement in the Hungarian Part of Tisza River Basin	Tisza/Hungary	Europe	Twin2Go
3	Delivering sustainable water management in a changing climate	Thames/England	Europe	TwinBas
4	Volga Revival federal program, 1998-2004	Volga/Russia	Europe	CABRI-Volga
5	Implementation of Environmental Code in Sweden	Norrstrom/Sweden	Europe	TwinBas
6	Red River Basin Planning Management Board, RBPMB	Red River/Vietnam	SE Asia	ASEMWaterNet
7	Kosi River Basin Management Strategy, 2007	Brahmaputra/Nepal	SE Asia	BrahmaTwin
Focus 2: Engagement and coordination among actors, forms of interaction/partnerships				
8	Lukoil corporate strategy on environmental security	Volga/Russia	Europe	CABRI-Volga
9	Stakeholder involvement beyond level required by law, Wuppertalverband	Dhenn (Rhine basin)/Germany	Europe	NeWater
10	Stakeholders inspire river management, "New Vasarhelyi Plan"	Tisza/Hungary	Europe	NeWater
11	Bottom-up learning: Stakeholder assemble knowledge about water management options	Tisza/Hungary	Europe	NeWater
12	Participatory water allocation in Bang Pakong, "Stimulating participatory process for water allocation in Bang Pakong River Basin" program	Bang Pakong/Thailand	SE Asia	ASEMWaterNet
13	Tala Hydroelectric Project, 1998-2007	Brahmaputra/Bhutan	SE Asia	BrahmaTwin
Focus 3: Enabling learning and building adaptive capacity in water governance				
14	Scenario analysis of hydrology and water resources of the Okavango Delta	Okavango/Botswana	Africa	TwinBas
15	Development/implementation of National Environmental Education Strategy	Brahmaputra/Bhutan	SE Asia	BrahmaTwin

While most of the expert stories registered during the series of regional workshops dealt with best practices applied in basins in the developing countries or transition economies, more than a half (nine cases) of the data base compiled by partners register best practices implemented in river basins in Europe. Most of the partners participating in the inventory took part later in the regional workshops.

3 Results of Best Practices Analysis

3.1 Best Practices in Water Governance

Best practices were a diverse assemblage of activities but unevenly distributed across the range of social-ecological dimensions (*Table 5*). Some best practices included features relevant to more than one dimension.

Table 5. Best practices dataset

Social-ecological dimension	Number cases	Examples
Political	10	Stakeholder engagement
Institutional	13	Legal frameworks IWRM Standards & environmental management systems
Financial	1	Micro-credit
Organisational	8	Basin organisations
Informational	29	Use of models and scenarios Observation networks Decision-support tools Assessment processes
Social	1	Gender-sensitive planning
Environmental	1	Retention areas in flood management
Infrastructural	10	Appropriate flood management infrastructure Piped residential water supplies

Best practices were applied and supported by various combinations of government, not-for-profit organisations, research organisations, private firms and local communities. Government agencies were the most prominent type of stakeholders in the best practice dataset (*Table 6*).

Table 6. Implementers of best practices

Stakeholder type	Number Cases	Examples
government agency	35	Ministry of Agriculture Ministry of Natural Resources & Environment Water and Energy Commission Local government
community or local water users	11	Water users
international organisations	8	Asian Development Bank World Wildlife Fund World Meteorological Organisation
research organisations	8	Institute for Hydraulic Research Budapest University Institute of Water Modelling
not-for-profit civil society groups	7	Royal Society for Protection of Nature Namibia Nature Foundation
private sector firms	5	FosGro Company Private hydropower developers

Most best practices involved partnerships or cooperation among two or more types of stakeholders. For example the drinking water project in Nepal was,

“The project is a joint undertaking of the UNDP/Public Private Partnership for Urban Environment (PPPUE) Programme, UN-Habitat and the Nepal Water Supply Corporation (now Kathmandu Upatyaka Khanepani Limited). A local group, Nepal Podland Youth Organisation spearheads the efforts. The revenue collected is managed by a local users’ committee and is used to sustain the project” (30).⁶

In another case the dynamics of developing a best practice were explained illustrating how different stakeholders get involved as implementation proceeds:

“The Practice was developed by the civil society, under a vague demand by the Stately Department of water resources of Brazil that carried out a workshop to ask that a discussion for the start of the committee would be organised.... The involved actors were the participants of the Committee that represented the users (irrigators, cattle growers, public service providers, fishermen), society (university, NGOs, trade unions, civil associations) and some public bodies, such as environmental management entities” (8).

Only a few cases reported that stakeholder groups clearly opposed a claimed best practice. Hydropower development in India (22) was opposed by non-governmental and student organisations. Some international initiatives were not supported by foreign affairs ministries (13).

3.2 Opportunities and Barriers for Best Practices Application

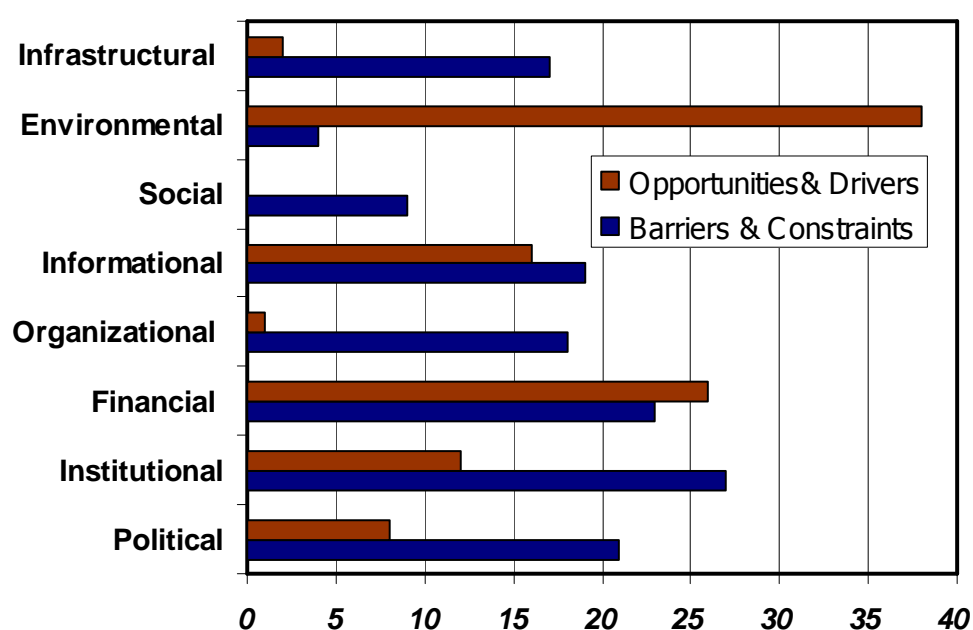
This section explores the processes and factors influencing best practice dynamics. The analysis is organised around the eight dimensions (Table 7.). Political, institutional and organisational factors were commonly cited as barriers. The frequency of mention in best practice cases of opportunities or drivers were distributed distinctly with, for example, the environment being relatively a common reason for attempting a new practice.

In each of the following sections we first describe the practice, then the drivers and opportunities, and end with barriers and constraints.

⁶ In this section numbers in parenthesis after quotes or particular claims refer to specific best practice case documents. These are listed in full in Annex 8.3

Table 7. Opportunities and barriers

Dimension	Barriers & Constraints	Opportunities & Drivers
Political	21	8
Institutional	27	12
Financial	23	26
Organisational	18	1
Informational	19	16
Social	9	0
Environmental	4	38
Infrastructural	17	2



3.2.1 Political

Improving stakeholder engagement in planning and decision-making was a rationale and feature of ten of the best practices (Table 5).

Expanding stakeholder engagement was seen as important to building trust (6), empowering local communities (30, 40), identifying local problems (21, 40) and a basis for a more transparent basis for decision-making (6). At the same time it was recognised that a substantial effort may be needed in communication to let stakeholders know about the existence of plans

and best practices (13). Although identification of stakeholders should be done early, there are costs too (25). The meaningfulness of participation of women and other marginalised groups (12) can be improved with capacity building workshops, internships and site visits (13).

Overall, political factors were more often seen as barriers than opportunities to best practices (Table 7.).

Changes in government and other forms of political instability were frequently identified as difficult barriers to overcome resulting in delays, changes in direction and “*loss of political support and funding*” (9). Polarised politics on some issues may likewise make change hard to bring about. Opposition from advocacy groups such as those opposed to large dams were given as an example (22).

Disparate interests among key stakeholders in water resources development are not unusual and may make consensus hard to achieve (13, 19, 22, 23, 92). For example in the application of new flood plans for the Tisza in Hungary conflicts between government water agencies as developers of dikes and reservoirs and land owners/users had to be overcome (19).

One way coalitions found to overcome barriers to new practices was to decouple it from formal processes and thus give space for experimentation.

In the Rhine case a key agency was concerned that failure in experiments with new best practice might be interpreted as weakness on their part:

“At the beginning, the Wupperverband feared that a failure of the voluntary stakeholder process could be interpreted as lack of its management capacity” (15). The solution was to have the “stakeholder process declared a research project. In this way, a failure would not have been a water management failure by the Wupperverband” (15).

On the other hand one of the limitations of this strategy is that it can make it difficult to bring new ideas arising from such practices back into policies and plans. In Hungary

“the alliance of stakeholders, which promoted adaptive practices, had no formal power to integrate their ideas into management plans. The Central Tisza Authority partly resisted against their ideas. Many water managers were not convinced of the adaptive management approach” (17).

At the same time formal recognition of multi-stakeholder platforms by framework legislation is not sufficient to make them effective (25).

Bureaucratic inertia, vested interests and lack of capacity are not always easy to disentangle but together may be formidable barriers to best practices. Several studies identified vested interests of key actors (12, 20, 40) or lack of political will (20, 42) as key barriers. Limited experience with public participation can be a barrier even when there appears to be support for such practices in water management agencies (25). In other cases civil society engagement may be actively suppressed (42).

Resistance may arise as a result of organisational interests and concerns with loss of power from institutional or other procedural changes. One of the clearest examples was the introduction of IWRM and River Basin Organisations (RBOs) in Vietnam's Red River, where bureaucratic competition greatly constrained application of what was supposed to be best practices (43):

“RBO structures became pawns in inter-ministerial competition: between the long established Ministry of Agriculture and Rural Development (MARD) and the newly created MONRE. MARD continued to be responsible for operation, construction and exploitation of water resources while MONRE took over most regulation and management functions – though the split was not functionally perfect” (43).

In management of transboundary basins loss of authority or power is also a recurrent issue: *“At political level the main problem was that this process apparently weakened national identity and it weakened even more the actions of entities at national level” (14).*

3.2.2 Institutional

Institutional best practices considered here focused on planning, standards and regulations. The most prominent intention was to implement IWRM in specific basins or watersheds (8, 13, 14, 24, 31, 43). The emphasis is often on principles and broad goals:

“The strategy plan aims at improving people's livelihoods significantly in sustainable manner by ensuring people's rights' over water and related resources, promoting socio-economic development for the benefit of all people while maintaining the ecological

balance in the Kosi River Basin. Main objective was to explore partnerships and the formulation of a vision for Kosi River Basin Management” (31).

Closely related are best practices in land use planning along river banks as illustrated in the Volga (34, 94), where in addition industry is being persuaded to adopt international standards and environmental management systems (36, 38). Implementation of water user permits was improved in a Russian case (32). Over-stringent norms on water quality can, however, also be a barrier to better practices, as they become too difficult, or even unrealistic to comply with by stakeholders (39).

Best practices sometimes emerged as a result of policy and other institutional reforms that had created windows of opportunity for specific innovations. In many cases these were related to significant new national water laws, legal frameworks or strategic plans (9, 14, 20, 29). In others more narrow changes clarified roles and responsibilities, for example, in supplying irrigation water (42) or as result of decentralisation problem identification and planning (14).

No panaceas were apparent, but a telling conclusion from the Latin American workshop was the *“importance of equilibrium between top-down and bottom-up approaches: the bottom-up approaches have most chances of success if they are articulated within the confines of the framework set up at “the top”; without the bottom-up initiatives in many case the top-down framework never “touches ground”, or is (currently, in the region, very often) only felt in a limited number of “pilot-zones” (93).*

Institutional factors were frequently cited as barriers (Table 7.).

Interplay among water or basin-oriented institutions and others is an important class of barriers. In transboundary basins making sure that all relevant actors are included is crucial but can be complex given national governance hierarchies. Thus, in the Cuareim River case a formal committee did not meet (7). The basin management model was resisted because *“this implies modification of clauses of the Bi-national Cooperation agreement, which needs diplomatic negotiations” (7).* This case has other complexities related to the federal system in Brazil whereas in Uruguay had single-level of authority. Likewise, the Chilean basin organisation for the Baker does not consider or include representation from Argentina, which instead occurs at the central government level (9). Water and Foreign Ministries also worked independently from each other in the Peru-Ecuador case (13). In other cases lack of international cooperation agreements hinder progress (22).

Transboundary basins involve complex institutional issues. But even within countries, coordination among local government agencies can represent similar challenges (16, 93). Federal-state interactions were also important in the Brazil Quaraí case (8). In dealing with waste water management and other urban water supply issues (16, 20, 32, 34) or flood plain interventions (19, 29) formal institutions are usually present but need adjustment to deal with new practices. Apart from issues of clear mandates or authority are issues of capacities and resources or incentives (33). These problems also exist within private sector (36).

With respect to river basin organisations a key issue has been lack of formal authority (40, 42, 43). This is attributed to lack of appropriate water resources legislation (40, 42) or ambiguous laws and policies (43):

“In 2006 MONRE released its “National Water Resources Strategy towards the year 2020” emphasize river basin planning and management which they controlled claiming that the Law on Water Resources has not been properly applied and is no longer suitable. MARD responded with its own “Strategy for sustainable national water resources development and management” Thus for several years each Ministry issued series of contradictory decrees and parallel structures attempting to maintain or expand authority and power. These were important political constraints on BP&T application” (43).

Lack of formal institutional recognition of best practice process can be a barrier to it going from pilot to wider implementation (17, 18) requiring alternative tactics by proponents to achieve policy uptake (18, 40).

“People participation is the key to the operation of the Committee. Coordinators are identified within each sub-basin, and they provide the bridge that allows the government and communities to design and implement appropriate solutions. At the grassroot level, the Committee challenges the people to find solutions to the issues. At the regional level, the Committee submits the river basin's projects for funding by the government or external sources. This process still needs to iron out some chinks but at the very least, the flow of funds from the central level to the river basin has started” (40).

At the same time formal regulation (institutional change) may not always be needed (8, 10, 12, 15, 40), just bureaucratic or public support:

“The motivation of the participants of the Committee was the possibility of building an autonomous management for the basin. But the favorable expressions of the director of the Department of Water Resources and the attitude adopted by the National Water Agency to consult the Committee about new water use concessions was important to consider the Committee as an effective component of the management system for water resources” (8).

3.2.3 Financial

Very few best practices were focused on financing. An important exception was a micro-credit scheme that supported aquaculture in ponds linked to river Niger (26).

“Community members in villages established grain banks. The loans for the grain banks were obtained through the exchange for work to protect and restore fish ponds by digging canals to connect fishponds to the River Niger. The grain bank was initiated by Wetlands International and involved local communities and municipalities. Three national micro-credit institutions handled the loan programme” (26).

At the same time financial and economic factors were important barriers or essential conditions in many cases (7).

Financing is central to infrastructure related practices, for example, for hydropower development in Bhutan (2) or India (22), developing drinking water supplies (3, 39) or implementing large-scale flood protection measures (19, 37).

Public procurement practices can be particularly important as observed in Hungary:

These “require selecting in all cases the lowest priced projects had to be selected, which in some cases could not cover all eligible costs of the projects thus endangering the successful completion of them.” One unfortunate side-effect is that “some of the municipalities had to sell some own properties or take up significant amount of credits from investment banks to come up with the required own recourses. These solutions heavily undermined the long term financial stability of such municipalities” (16).

Misuse, corruption and poor allocation of funds by government are also a major barrier to best practices (36, 38, 94); *“thus, strict control of resource flows, transparency and accountability before the public is essential” (94).*

For organisational, institutional and informational oriented best practices financing was often among the key barriers (25, 29). Organisations are created to manage basins without sufficient funds to implement their objectives or mandate (9, 43). Funds are insufficient to build up or maintain observation networks for flood monitoring and forecasting (29). Compensation schemes in case of retention reservoirs required for flood mitigation needed to be worked out for farmers (19) and must be sufficient.

Inability to raise adequate funds is one of the major barriers to expanding implementation of best practices beyond pilot sites (92). Support from international organisations has often been crucial (5, 16, 20, 92). But this often raises concerns about sustainability after convening projects end (5, 26, 43).

Adoption of best practices by firms is seen as one way to improve their competitiveness (5, 11, 38). Government may help with subsidies – for example, to smaller hydro projects (22). On the other hand, if no financial or marketing incentive then getting firms to reduce pollution is much harder (16) – for example if just operating in domestic market in Russia (38). In Chile international market relations are important to adoption of best practices:

“due to the fact that a great deal of its economy is based on economic opening and export of resources. In the Biobio River basin different cellulose, forestry and fishing industries are located, whose main selling market is international. For this reason the demand for “green” products or “environmentally friendly” generated a change in conduct on behalf of the private industrial water users who aimed at the international market” (11).

For the wider public one incentive in larger infrastructure projects can be employment (19, 22).

3.2.4 Organisational

The notion that river basins required an organisation to manage them was a common element of best practices in this study (Table 5). These have been created at different levels and with varying sectoral emphasis. Typical is:

“Since 2003, in order to improve the organisation of water resources management in the Republic of Uzbekistan and to provide a transition from administrative-territorial to basin principle of irrigation systems management, 10 Basin Irrigation system Management

Organisations (BUIS) and 56 Sub-Basin Irrigation System Management Organisations (UIS) have been established” (42).

As already noted above creating river basin organisations without giving adequate attention to institutional and financial issues has been a recurrent problem in efforts to expand and transfer ‘best practices’. In this light the conclusions of the Asia workshop that *“all participants have the opinion that in the future water management on the basin level is absolutely essential”* (92) may be wishful thinking. Analysis of barriers confirms the need for caution.

Organisational barriers were much more prominent than opportunities (Table 7.).

Well established water bureaucracies have their own culture and norms. Thus, a key constraint in the Tisza *“was the fact that many water managers favored the traditional management paradigm, which relies on massive technical infrastructure to control the Tisza River”* (18). The technical, infrastructure-oriented, approach to solving water management problems is widespread and often a barrier to best practices (10, 12, 17) – in Bolivia as *“strongly rooted uses and habits that do not allow innovation and restructuring”* (4).

Lack of human resources and organisational capacity to deal with new practices such as public consultation and participation are also important barriers (14, 24, 39, 43). This includes lack of trained personnel (11, 43), adequate technical knowledge (40, 92), equipment (2, 11) and experience (42).

Bureaucratic fragmentation and competition is also important and intertwined with institutional issues of roles and mandates (37, 43).

3.2.5 Informational

Informational-related best practices included aspects like monitoring, databases, modelling, assessment and decision-support tools were overwhelmingly the most common form of the best practices in this dataset (Table 5).

Scenarios were a feature of at least five cases (7, 8, 9, 28, 41) and often made substantial use of models for exploring climate change and development options (7, 28, 41). Models were also important to flood forecasting (35, 37) and exploring water allocation options (39, 40).

The need for better quality or more extensive observational data was also part of several best practices for baseline assessment (6, 9, 10, 12, 41) and longer-term monitoring (11, 29, 35, 36), for example, to drive flood forecasting models:

“The real time data acquisition system has further been extended to other river basins in West Nepal including the West Rapti River basin and the Babai River basin. In addition, a flood forecasting system is being implemented in the Bagmati River basin under additional support from the Danish Government (DANIDA). The web-based facilities have also been useful to some agencies working at community level. Practical Action, an INGO, has been conducting some awareness program to include the available real time data and information system is being used to develop a stream flow forecasting system for the Narayani and Bagmati basins in central Nepal” (29).

Several best practices were more concerned with data organisation, management and assessment for decision-support (6, 7, 39, 40) – for example, *“To establish a research based basin wide knowledge system in order to focus the work of OKACOM” (27)*, or *“Provide information in a real-time manner appropriate to the decision-making requirements of the stakeholders, for disaster management and building resilience of the communities for climate change adaptation” (29)*. Intended objectives and expectations for informational-best practices were often high.

Informational factors were important as both barriers and opportunities to the adoption of best practices (Table 7.).

A common form of opportunity identified was the existence of scientific or technical networks (6, 12, 17, 27). Thus in the Tisza,

“the driver for the involvement of members from the informal alliance was their high expertise in adaptive river landscape management. This expertise originated from previous activities in a learning arena, which had assembled traditional regionally-based knowledge and innovative approaches from abroad.” (17)

Availability of decision-support tools (7), accessible information (29, 93), and existing databases and assessments (9, 40) were also mentioned. Technical assistant packages are important drivers (43). Best practices often build up on previous work.

“The allocation system was a follow-up to two earlier studies, the Bang Pakong Dialogue Initiative (2003-6) carried out by ADB and DWR and a water allocation study by DWR (2006-7). This meant a coordinating body was in place, data for modeling had been assembled, and that stakeholder consultation processes were in place” (40).

For informational factors barriers were typically the converse of opportunities. For example such as incompatible data classifications and formats (7, 12) and lack of public access to information (7, 11). Challenges were particularly acute in Uruguay where:

“information is not of public domain in Uruguay was a barrier since long ago. In Uruguay the Law on Water Politics was approved in 2009 including public access to information....Another restriction is that in Uruguay the information is not publicly available, not so in Brazil. Another problem is that no shared mechanism for database management and maintenance was implemented once the project finalised” (7).

Lack of awareness among stakeholders and general public about an issue is partly an issue of communication (20, 29, 37, 39, 43). These go beyond technical content and into issues of format and usability of knowledge.

“Difficulty to transmit intangible results, whose utility is not immediate for the population, added to the indifference of the communication media regarding environmental themes and the shortage of specialised media” (13).

3.2.6 Social

Very few best practices had a distinct social (as opposed to economic) dimension. An important exception was the emphasis on gender-sensitive planning in the bi-national Catamayo-Chira project between Ecuador and Peru.

“To obtain effective participation of women in the basin in the formulation of the POMD an identification of representatives of women organisations was carried out (social groups, production groups). Their capacities regarding integral water management, leadership, participation, communication, etc were strengthened by means of different workshops, internships, meetings and visits to the upper, medium and lower parts of the basin. Actually these strengthened women leaders are organised in the Bi-national Platform of Women and from this platform and from their organisations they participate in different activities and processes organised in the Basin” (13).

No social opportunities were identified but several barriers (Table 7.).

Women's lack of access and rights to land and water were a major constraint on best practice adoption in Mali (26). Elsewhere local norms imply water is not a commodity that should be paid for (39).

A long history of water regulation in the Tisza created strong land use and social systems dependent on highly regulated river flows (17).

Histories of authoritarian rule and suppression can impact on the development of civil society and social expectations (42).

Patterns of human settlement are a constraint for infrastructure projects attempting to provide piped water (20), irrigation access (23), wastewater treatment or flood protection measures (17). This later observation is really a mix of social and ecological processes.

3.2.7 Environmental

Direct manipulation of the environment was rarely a primary focus of a best practice (Table 5). One exception was the use of retention areas to manage high floods in the Tisza River (19).

Environmental problems and opportunities, however, were overwhelmingly important as drivers of best practices (Table 7.). These included dealing with rising water demand and low availability (13, 26), poor water quality (4, 10, 18, 20, 34), degraded aquatic ecosystems (5, 25), and high flood risks (18, 19, 21). Serious flood and pollution events often helped trigger or drive further change in best practices (5, 18). Climate change is expected to exacerbate problems of shortages and floods (4, 25, 29, 41, 93).

Conversely, high availability of water resources was used to justify hydropower (22) and irrigation (23) infrastructure development as a best practice. High existing environmental quality in Bhutan was seen as an opportunity to continue best practices (1) even as adverse impacts on biodiversity of some hydropower projects is acknowledged (2).

A common response to scarcity calls for optimisation tools to improve allocation:

“The increase of the pressures for the use of the water resource makes it necessary to optimise its use, for which it is necessary to incorporate tools and information that allow carried out the analysis” (7).

Environmental factors were rarely seen as barrier except in sense of low available resources (13) or sensitivity to infrastructure interventions (2, 25).

3.2.8 Infrastructural

Infrastructure was a key element of several best practices studied (Table 5). These dealt with aspects like waste water treatment (16, 36), provision of drinking water supplies (20, 30), irrigation canals (23, 42), flood protection and hydropower development (2, 22).

A program in Hungary, for example, allowed for diverse technologies of wastewater treatment tailored to environmental and economic settings (16), whereas a program for drinking water supplies in India followed different strategies in rural and urban settings (20). The New Vásárhelyi Plan for flood safety in the Hungarian part of the Tisza River Basin included six emergency flood retention reservoirs while also promoting nature conservation and environmental protection and alternative agricultural land uses in retention areas (19).

“The program reflects a new government philosophy, in that it takes as far as possible into consideration the interests of environmental protection and nature conservation. Implementation of Stage I have been shown to be less expensive and more effective than the traditional emergency measures of flood fighting” (19).

Difficult physical conditions can delay and raise costs of infrastructure (2, 20), for example, because of topography in case of irrigation (23) and presence of land mines in Angola (27).

Telecommunications infrastructure has been a major constraint in Nepal, but conditions are changing fast with new technologies:

“Inadequate data dissemination mechanisms as telephone and internet facilities are not accessible to a major population of the country. The situation, however, is changing as the prices of mobile system are sharply decreasing” (29).

Legacy of earlier water flow regulation infrastructure (17, 19) or urban-industrial infrastructure (34) can make best practices in land use planning difficult to implement in practice. On the other hand, existing infrastructure can sometimes be an advantage for a new practice (20).

3.3 Best Practices Transfer and Exchange

3.3.1 Main Types

Not so much detail was documented on how transfers of institutional BP&T were actually achieved, and not all collected inventories responded to questions about transfers as distinct from issues of uptake of best practices themselves as discussed above. Even so, there were still some insights.

Attempts were made to transfer several *types of best practice* (Box 1), for example, river basin organisation models, basin management instruments (31, 42, 43), environmental information systems and agreements (92), bottom-up approach for stakeholder participation in small transborder river basins (05), application of polluter pays principle, or charges for water use (94) and unified international standards. In the case of contemporary Russia, for instance, many institutions and practices have been borrowed from the EU or USA. (32, 34, 36, 37, 38, 39, 94).

One common strategy was to move from a pilot site or success story in one location to other sites in same or a different country. Another was to make use of pre-existing platforms for local engagement (5, 25) or research knowledge (27). Worldwide international transfers of 'standard' good practices were underway as well.

Box 1. Twin2Go Inventory: Examples of BP&T multi-scale transfers

- “Hot spot” approach applied in rural areas in the Inner Niger Delta, Mali (Africa) for sensitive ecosystems under the development and climate change impacts can be up-scaled and transferred across the region (26)
- New national system of RBOs in Vietnam is borrowed and imported from other river basins (43)
- Transfer and application IWRM in river basins in Kosi (Nepal), Red River (Vietnam), Baker (Chile) is underway; IWRM use in Amu Darya (Uzbekistan) is initiated for irrigation and agricultural use, and the major model was borrowed from the EU (09, 31, 42, 43)
- Long-term water quality monitoring program through the Biobio river basin network as a support tool for awareness raising, green-marketing and decision-making (11)
- Basin-wide information and knowledge system to ensure effective implementation of water management in the Okavango river basin (Africa) (05)
- Bottom-up approach for stakeholder participation in transborder river basin management in the Orange-Senqu river basin (Africa), might be replicated in other river basins, especially the small ones (06)
- “Every River has its People Project” – existing community organisations or resource user groups in the Okavango river basin (Africa – Angola, Namibia, Botswana): this tool can be used as platforms for transboundary water governance and BP&T exchange and uptake (27, 28)
- RBO serving the Limpopo Agreement established a solid platform for the riparian states to learn from each other and provided an inventory of stakeholders involved in its implementation (25)
- Major basic principles of the EU Water Framework Directive were borrowed by Russia while developing its new Water Code, 2006 (94)
- International organisations are involved in dissemination of water allocation tools and active local stakeholder engagement within several sub-basins in Bangpakong and Prachinburi, Thailand (40)
- International hydrological research and joint modeling in the Volga and Rhine by various research organisations and universities is a useful tool for exchange of practices and knowledge between Germany and Russia (37)
- International ISO norms and green products practices and tools are disseminated worldwide to enhance market competitiveness (38, 36, 10, 11)

Several *forms of transfers* of institutional BP&T were discussed. They vary depending on the scale of transfer and type of donor-recipient participants involved – across basins, countries, targeted regions and globally. This section of the report deals with both – international and domestic transfers. Main forms of transfers include:

- 1) *transfer across river basins within the same country*. They mainly relate to wider dissemination and exchange of good practices domestically (26 - Niger river basin).
- 2) *transfer and coordination of BP&T across the targeted region*. Typically it relates to replication and introduction of common practices in shared basins (24 - Lake Victoria; 25 - Limpopo; 06 - Orange; 08 - Cuareim) of the targeted region, and examples are quite numerous.
- 3) *import of BP&T from other countries and regions*. Usually, it envisages the transfer of modern practices from different water governance systems (32, 42, 94 water governance systems in Russia, 42 - basin management in Uzbekistan).
- 4) *uptake of unified international standards and practices*. This form of transfers is a result of globalisation and standardisation (voluntary and obligatory) of international practices in

water management (38, 36 - ISO standards; 36, 94 - corporate environmental responsibility and strategic planning; 10, 11 - green products strategies in Biobio basin)

- 5) *application of BP&T in compliance with international agreements* (26 - wetlands preservation in the Niger delta (26), in the Volga delta (32)

3.3.2 Approaches and Discussion

Contemporary BP&T in water governance is a result of evolution within the long historical process of institutional regime formation. The role of borrowing and transfer of best practices worldwide has increased due to globalisation, international cooperation and efforts of international agencies promoting their diffusion and social learning. Usually, the institutional practices that are most effective are borrowed and disseminated internationally. In some cases developed countries that 'export' the transplants are even ready to support and partially cover the transfer costs.

Currently the most typical BP&T in water governance that are transferred worldwide include IWRM instruments, river basin organisation models, adaptive water governance systems, polluter pays principle, coordination in water management, unified international standards, participatory decision-making, a variety of decision-support systems, water and environmental information processing and modelling, tools for stakeholder networking and partnerships, bottom-up approaches for stakeholder engagement in small shared basins and others.

The Twin2Go BP&T inventory demonstrates the international transfer of these practices in all targeted regions under survey. There are also numerous examples of local practices and success lessons that are transferred domestically across basins within the same country, or between the riparian states of a shared river basin in the targeted regions of Africa, Latin America, Europe and SE Asia.

The process of institutional practices transfer and uptake is an integral part of domestic water governance reforms. It is planned, and the transfer strategy is developed. Import of modern and effective institutions is usually aimed at speeding up the reforms in the water sector.

Typically through reforms *developing* countries and *transition* economies⁷ borrow most effective water institutions from *developed* countries. Hence, the process of international transfer across

⁷ Twin2Go discusses water governance systems in BRICS countries – Brazil, Russia, India, South Africa

groups of countries with different societal systems takes place – from one system to another, which is important for analysis of the transfer specifics. In this case we use the term ‘transplantation’ of practices – i.e. borrowing of institutional transplants and their further development within the new frameworks of recipients. Twin2Go also discusses the exchange and transfer of local practices across basins within the targeted regions involving countries with similar systems. Our analysis indicates that in the latter case the transfer process is easier and less contradictory. Transfer of practices across smaller transborder river basins is also less controversial than in large transborder basins, where not only more riparian countries, but also more stakeholders with a variety of interests are involved.

Although, reformers in the water sector usually borrow and transfer institutional practices from the most effective water governance systems, such strategy may not always result in success and might be accompanied by implementation problems. Practice shows that institutions that are effective in one system can be useless or even destructive under a different social system. Transplanted institutions might not match and root into the situational societal specifics. Thus, the problem of institutional fit is among the most challenging issues of institutional dynamics. For this reason, *first*, the selection of proper transplants is extremely important. *Second*, choosing methods and principles for governing transfers matters. *Third*, taking into account the political, institutional, economic, social and cultural context is crucial in order to avoid failures in a course of transplantation. *Fourth*, adaptation of institutional transplants to the specifics and current situational factors of the recipient country is often required.

A variety of other problems associated with the process of uptake of best practices are indicated. Each reform in the water sector is associated with externalities and costs. For example, among important preconditions of success Twin2Go experts from Africa indicated that sufficient funding for the implementation of imported institutions is crucial, as well as ensuring additional financial, know-how and human support for the follow-up stages of the international project in river basins once it is finalised. There is also a variety of political issues involved. Political support from domestic government and water authorities is essential for successful performance of new practices. Another problem might be that quite often domestic agencies in recipients compete for control of new financial flows – within reforming sectors the process of institutional innovations becomes an instrument in bureaucratic competition aiming at control over resource allocations. Without developed public control over performance the imported new institutional practices might be doomed to failure.

In order to avoid failures certain phases of transplantation in the water sector can be suggested: 1) selection of transplant and its strategy; 2) creation of transplantation infrastructure – development and lobbying of new laws, establishing additional provisional institutes; 3) measures for adaptation; 4) management of transfer process. Usually, the transplantation of best practices is a gradual process, in which a rooting period of an institution is required. This process is usually based on a set of institutions in the water sector that are characteristic and compatible with the recipient's specifics and sustainable development priorities.

3.3.3 Role of international agencies and foreign assistance

It was indicated that in many cases imported practices have best chances for successful implementation in the recipients if they are supported by international organisations – intergovernmental and non-government, and through bilateral assistance programs. Stories of international involvement in BP&T transfers are numerous. International organisations and agencies are often used as mediators for enhancing the profile of transborder arrangements and their performance, as for instance the World Meteorological Organisation (WMO) and Global Water Partnership (GWP) in the case of the Lake Victoria Commission (24). The World Bank supports the implementation of the Irrigated agriculture program in Assam to distribute practices of tapped shallow groundwater with tube wells to irrigation through community farmer associations and water users committees in India (23). Such international organisations as Wetlands International disseminate BP&T and implement demonstration projects of micro-credits for eco-services in the locales to protect sensitive ecosystems in the Niger basin in Mali (26). The Asian Development Bank (ADB) in the Bang Pakong basin in Thailand is involved in widening awareness of government agencies in coordinating their efforts with local stakeholders and the river basin committees (40). External training and funding from Italy provides support for the monitoring programs implementation at the local level in the Biobio river basin in Chile and for compliance with advanced technology parameters collection requirements (10, 11). The Danish government and other international agencies support the project of Climate Change monitoring and adaptation through efficient information flow for the Bagmati River Basin in Nepal (30), while WWF Nepal (together with the government of Nepal) assists for the Kosi River Basin Management Strategy (31). Sub-regional BP&T transfers and coordination are promoted by the Association for Environmental Conservation and Rural Development and the Kalahari Conservation Society in order to facilitate community participation in the Okavango river basin (05)

Other stories note that the impact of international agencies and foreign donors in the water sector depends on the national perceptions and politics towards the foreign assistance in general. For example in Russia, during the beginning of the transition period in the 1990s high preference was given to foreign aid. Following the rapid economic recovery, the strategy has been dramatically changed, and high reliance was given to mobilisation and channelling of domestic resources and capacities while foreign aid became limited. These trends were manifested vividly in water governance regime formation (94).

There is a broad discussion worldwide about the role and effectiveness of foreign assistance, and many of its discourses are also characteristic for the BP&T transfer in the water sector. Donors are often ready to cover the costs of BP&T transplantation, sometimes competing for dissemination and implanting their own institutional product. That way, besides the development of water governance systems, their interests may include a broader variety of issues, as for example, ensuring the economic and political preferences in a recipient country. They also presuppose the possibility of realizing the strategic and political influence, creation of new markets and ensuring export flows, additional investment opportunities, control over resources, financing of innovations through foreign grants, ensuring contacts, or brain-drain of qualified specialists, etc. National funds of donors also seek for contracts with their own specialists to widen the opportunities for jobs and services. Some experts note that selection and offer by a donor of an institutional transplant in the water sector sometimes might be even not optimal from the standpoint of a recipient, or does not take into account the multiple details of the existing context. In many instances the selection depends on preferences of the donors, or their intermediaries that strive for contracts.

International *standardisation* and *unification* of practices worldwide result in global dissemination and application of common governance tools and methods. It was indicated, for example, that in order to enhance business competitiveness and enter international markets businesses voluntary apply ISO international environmental management standards (36, 38). In Chile, export markets and international standards provide for special incentives for 'green products' and for the behaviour of export-oriented sectors (10, 11). International standards are started to be voluntarily applied by large export-oriented firms in Russia in order to ensure stable export flows and increase their competitiveness. In many cases the external international trends and requirements play an increasing role.

Of a particular attention of experts was the role of international coordination and exchange of institutional BP&T in the *shared basins*. For example, the donor support is regarded among

reasons for success in establishing the RBO system in Vietnam (43). The “Every River has its People Project (ERP)” in the Okavango river aimed at community participation in RBO is an initiative in shared rivers that can be transferred to other basins (05). Experts noted that transboundary coordination and exchange in shared watercourses helped to alleviate issues that are difficult to solve at national level and promoted broader exchange of BP&T in exploration and efficient use of basin resources like it is in the lake of Victoria (24). Stakeholder identification and mapping for effective implementation of transborder agreements and for stakeholder integration strategy is a success story in the implementation of the Limpopo Agreement, and it can be transferred across countries to learn from each other (25). In cases where a basin-wide data base is available, and it is registered that the capacity is lacking in some riparian countries, the priority focus on capacity building in the latter is suggested (06). Exchange of good institutional practices, water management experiences between national sub-basins in shared rivers of Brazil and Uruguay is underway, and many interesting lessons can be learned from their experience (08).

3.3.4 Context - Adaptation

BP&T transfer is a highly *context*-dependent process. Taking into account the context-specific factors both natural and social is important for success of transfers. Particularly the societal specifics matters: it is among the basic drivers defining the process of BP&T transfer. Its role is of a high importance in case of international transplantation across countries with different socio-economic systems, and to a less extent within the transfer across similar environments. However, in the latter case it is also needed to be taken into account. Context is usually regarded as the main criterion in the selection of transplants. Comparative analysis of conditions and context of a donor and recipient is an essential part of the transfer process. Understanding of culture and history, differences in capacity among countries (asymmetry) (06), political, specifics in institutional and socio-economic frameworks (39, 94) were indicated as a ‘must’ which helps to avoid failures in transfers. It was suggested, for example, that targeted capacity assessments in shared rivers in Africa (06) can be useful for learning about the context specifics and at the same time establishes trust between countries involved and a transparent basis for decision-making.

It is widely recognised that transfers of best practices within and between countries need *adaptation* to fit social, institutional and environmental context: for example, fit to the actors involved, their interests and the physical characteristics of the basin (12, 39, 93) and the

institutional setting (94). This makes generalisations about how to make successful transfers and overcome barriers extremely difficult:

“From the perspective of the “receivers”, the opportunities, possibilities, constraints for transfer and needs for adaptation to local conditions very much vary case by case. It is therefore very difficult to extract generalized conclusions regarding very specific tools, besides the more specific sub-aspects of these BP&T that can be more widely recognized as “being important” or “more broadly applicable”” (93).

The difficulties of transfer and adaptation processes are such that the side-effects can be worse than the original problem:

“The transference of any of these initiatives requires without any doubt adaptation to the local context. Nevertheless this is a delicate subject because it is not so easy to adapt to local context because it can result that it does not induce the desired effect and turns into one more initiative that does not favor participation of all actors and that in the worst of cases, deepens even more the lack of credibility and initiatives promoted by public organisations” (10).

The necessity for the context-specific adaptation of some BP&T to local societal and natural context was underlined in many cases – both in a course of international and domestic transfers and exchange of good practices. For example, participatory water allocation in Thailand has been extended to six districts within the Bang Pakong sub-basin, and its further adaptation was required – formulating a clear concept how it can be better transferred to other basins taking into account their numerous local specifics (40). Other cases showed that BP&T transfer was possible, but practices applied need to be adapted to local conditions and needs: e.g. for flood and river bank erosion protection, the transfer of data across north-east Indian states was the basic requirement (21). Data transfer across country borders of Nepal, India and Bangladesh has often been even more restricted (21, 22, 30).

Without effective adaptation some good practices transferred might be deformed, and their results might differ from the expected standard outcomes. For example, in a course of transition reforms in Russia in the 1990s the use of the polluter pays principle (PPP) borrowed from the West demonstrated lower effectiveness than envisaged at the start of reforms. The system of pollution charges was significantly distorted by the context-specific factors of the transition period, and without initial taking them into account and adjustments this tool faced obstacles to

implementation. *First*, due to the weakness of the government authority in the country at that period it offered producers means of avoiding payments and investments to modernise their obsolete technologies. *Second*, territorial environmental organs being under subordination to local administrations were unable to apply true levers of control and enforcement towards polluters. *Third*, a number of economic privileges were granted to polluters against the original design of the PPP system. *Fourth*, consolidation of environmental funds in the regional and federal budgets allowed the use of environmental payments for purposes different from environmental protection (94).

However, the possibilities in modifications of imported institutions that are adjusted to the local specifics are limited. *First*, the profound alterations might cause distortions in their design and results, and consequently the following implementation gaps. *Second*, each reform in the water sector is associated with additional costs, and that is why the possibilities of significant changes have limitations.

Usually, the transplantation strategy envisages gradual adaptation of transferred institutional practices and their further development within the recipient's social and natural environment. Certain interim and assisting infrastructure and organisations are required for transfer and adaptation, which helps transplanted practices to root in and to further develop. Correctly selected interim institutions and their chains help the adaptation, allow reducing the transformation costs and avoid institutional distortions. This is typical of gradualist approaches to reforms and transfer of BP&T.

Experts also noted that each adaptation strategy envisions the process of mutual fit-in: not only imported institutions need to adapt to the local context. An adaptation strategy should incorporate measures aimed at adjustments of local actors' behaviour to new imported institutional practices.

All these considerations need to be taken into account while developing BP&T transfer strategies. The formation of specific transfer strategies and principles of selection of transplants that fit into formal and informal structures is a basic condition for success.

3.3.5 Reason for success/failure

Another factors found to be important to success in transfers was having sufficient technical and financial support (4, 10, 92). Local capacity in river basins is usually seen as the useful precondition for practices transfer. Political support from the government and promotion of new practices by local authorities (26, 22, 23), existence of research institutes and information networks to build on, strong national and local water management frameworks, river basin commissions and transborder organisations (25, 26), community organisations or platforms, as well as resource user groups (06, 40) were indicated as important drivers. Existing domestic legal frameworks in recipients are used, for example, as a basis for transfer and implementation of integrated water basin management strategies (31, 42, 43), and domestic enforcement and implementation practices are regarded as a precondition for success (92, 94). Regional cooperation between countries and transborder partnerships are crucial. Support of international organisations was also acknowledged (24, 26, 40, 43, 92).

Usually, there is a tendency towards international borrowing of the most advanced and innovative institutional practices in order to speed up domestic reforms and the process of institutional regime formation. In certain cases such inclination might result in failures, and direct imitation of ‘western’ administrative models might be not successful. Avoiding shock transplantation in recipients in favour of gradual processes and formation of interim institutions provide additional chances for success.

There is always a danger that the transplanted institution is not rooted and properly embedded into the societal context of a recipient, and its natural and social effects might contradict to existing formal and informal practices. Its compatibility with and fit into the societal organisation and governance system – both ‘exogenous’ and ‘indigenous’ to the water sector – is among the major problems. Transfer of institutions from countries with developed democracy into countries with low civil culture can often result in failures and distortions; desire of elites not to share authority with people is a common feature in the latter. It was noted in many stories of Twin2Go experts that lack of public control, of stakeholder engagement and of mass-media freedom as well as flourishing corruption are among barriers for success of a transplant.

Experts also indicated that among the major reasons for failure is the incompatibility of changes with the existing informal practices in the recipients.

Difficulties in various types of coordination can be a problem. For example, a high number of stakeholders or larger basins with a high number of riparian states in shared basins are seen as an obstacle for effective BP&T transfer and application: multiple interests and local communities with a diversity of local dependencies on water need to be coordinated (06). Complexities in the coordination of national interests and capacities as well as in the development of a joint investment strategy in international watercourses (24) were also acknowledged. Lessons of the Limpopo Agreement indicate that the lack of solid coordination structures and infrastructure for bottom-up (and vice versa) linkages and transfer of information (25) might cause problems. Most of the barriers that are typical for BP&T implementation in the water sector in general can also be seen as constraints for international BP&T transfers.

Shortages with funding to support the development and rooting of the imported practice are regarded as a barrier. Usually, new practices are associated with high transaction costs (26) for their implementation. Threat of sustainability of the project initiated by external (international) partners after its termination is indicated as an obstacle for success; strong monitoring and feedback mechanisms are advised for actual implementation (26). It is also indicated that among difficulties for uptake of practices from other regions is the raising of adequate finance at the locales, and lack of know-how and technical requirements for setting up comprehensive data bases (91, 92). In many cases lack of political will or consensus among actors and differences of interests of stakeholders affected by imported practices, lack of knowledge about traditions and culture are regarded among obstacles for BP&T transfer. Differences in political systems in donor and recipient countries within a shared river basin – like it is in the case of Brazil and Uruguay (07, 08) can be seen as a limitation; in this case they are supplemented by the absence of an institutional basin management framework in Brazil and the necessary legal basis in Uruguay, which is essential for bi-lateral management and exchange of good practices within the Quarai-Cuareim shared basins.

3.4 Outcomes

It should be noted that this collection of case studies is likely to be biased towards examples showing some success in applying a best practice. For that reason overall patterns in levels of success do not have much interpretable value. But there was a range of outcomes: a few applications were rated as very successful (8, 11), most as mixed, and a few as largely failures (14, 43). In some cases the best practice had only just begun to be applied, so it was premature to assess outcomes (1, 4, 13).

3.4.1 Reasons for success and failure

Several reasons for success (and failure) were identified.

Active participation of stakeholders was frequently seen as important (12, 13, 30, 31, 40, 43). It can, for example, support more transparent planning (4, 19, 30, 40). Openness of government actors to external information and ideas was also viewed as important (15, 17). In some cases best practices help create arenas where alternatives could be explored that otherwise would not be (18). An outcome of good facilitation (15) and dialogue is increased cooperation among stakeholders (15) and shared benefits (2). From the perspective of state agency applying a best practice,

“It is necessary to have a negotiation, social regulations and a network to establish an agreement and follow up water use in the basin. The founded network is responsible for data collection and water use report..... To be successful, the process must create an awareness among stakeholders and involve all stakeholders in water allocation” (40).

Ultimately, greater stakeholder engagement can lead to better development:

“It is necessary to know the actors of a basin, listen to their proposals, problems and ideals, this allows to have clarity about what is necessary to communicate. This process is slow, expensive and complex and requires huge efforts on behalf of the technical personnel, but the results that it offers contribute considerably to the achievement of the development objectives” (13).

What is clear in many of these examples of stakeholder engagement is that communication and sharing of information is crucial (9, 12) and for this the media can be helpful (29).

Infrastructure-related best practices are successful when there are adequate funds (9, 19, 20, 21, 29, 31) and investments are completed according to plan (16, 19). Falling costs of advanced technologies can be an opportunity (29). On the other hand, economic crisis and inadequate funds on the other hand can result in failure (34).

Moreover, infrastructure-related best practices are at risk of distortion because of financial incentives or their lack. Over-built capacity (16) or too expensive technologies waste resources (16). Too much emphasis on meeting planning targets rather than needs puts infrastructure in wrong place (20). Poor planning can mean that irrigation infrastructure does not work well (23). Lack of maintenance can mean that flood infrastructure becomes ineffective (21). Training and capacity building in operation and management lead to users accepting and taking greater responsibility for maintenance (23, 42).

The interests of key political actors and overall stability of government is another factor in success. Without political support or willingness many best practices cannot go beyond pilots (9, 15). Changes of government or major reforms, because they change key personnel, can be often disruptive (9, 14). Recapture and reinterpretation of plans as people in key positions change was documented for flood protection measures in Hungary:

“The implementation was hampered, because the stakeholder alliance lost its main supporter in the Ministry of Environment and Water when this person changed the job, and water managers who implemented the New Vásárhelyi Plan reinterpreted the plan in such that the measures became less adaptive. This shows that even though support by key actors had been strong during the planning process, there was not sufficient support for adaptive approaches among water managers at the more operational level” (17).

In Vietnam, the RBO model promoted by international organisations, for example, overall had a problematic outcome leading documenters to conclude that,

“A key, cautionary, message from this example is that what are ‘commonly perceived as BP&T’ like ‘introduce RBOs to implement IWRM’ may turn out to be a far cry from ‘best practice’, when they are pushed in by external actors with inadequate attention to real needs, capabilities and interests of existing organisations in a place” (43)

3.4.2 Consequences for adaptive governance

The consequences of applying best practices for adaptive governance were explored in the inventory questionnaires. From the responses it is apparent that what was meant by “capacity

for adaptive water governance” or the “adaptive behaviour of stakeholders” was not widely or consistently understood. Nevertheless a few pointers emerged.

Informational-related elements of best practices – perhaps not surprisingly given importance of learning – were the most common category. Best practices were seen as leading to greater level of shared understanding (5, 12, 17, 20, 40) including specifically of risks and thus investments needs for adaptation (4). Best practices improved understanding of the uses and limits of scenarios and models (40) as helped stakeholders explore strategies to respond to climate change such as by reducing water consumption (8, 35).

Best practices related to infrastructure design and operations improved water use efficiency or adoption of water conservation measures (32, 40). Monitoring of water supply schemes (20) provides opportunities to learn and adjust.

On the organisation dimension improved working procedures and commitment (8, 32) could support more adaptive management:

“The progress of the management capacity of the basin is visible. The Committee discusses all themes related to IWRM. The ordinary meetings have always the necessary quorum and proposition attitudes. The users adopt proactive attitudes, such as self-auditing of the removed flow from the riverbeds, discussion about new users, proposals for impact studies of infrastructure works in the basin, modeling of climate change effects on short or medium term, among others. The executive secretary is active and keeps a communication structure between all members which allows decision making, document revision and discussion on very short term” (8).

Although few best practices dealt directly with social factors, many of the consequences that might be seen as supporting adaptive water governance were social in character. For example, best practices built trust (5, 40), improved capacities to cooperate (15) and provided arenas to resolve conflicts (8) or explore alternatives (4, 5).

Best practices also helped develop sense of ownership for infrastructure (23) and improved corporate environmental responsibility (36, 38). Finally, best practices mobilised support for adaptive management approaches more broadly (11, 17, 18, 19).

4 Best Practices Guidelines and Recommendations

4.1 Overview of Guidelines

Twin2Go policy guidelines on best practices and tools (BP&T) for policy-makers and practitioners are the result of a thorough consultation process with experts from Africa, Latin America, South-East Asia, Russia/NIS and the European Union who were involved in the series of four regional best practices workshops. They provided a unique opportunity to bring together for joint discussions experts from various scientific disciplines and institutional backgrounds such as academia, politics, business, industry, international organisations and NGOs.

Twin2Go developed a set of fifteen policy guidelines with the supporting recommendations for action in the application of best practices and tools in water governance that are based on the lessons learned from experts (Table 8). All guidelines and recommendations are structured according to the major Twin2Go foci applied during the analysis of BP&T. They are described in detail below.

Table 8. Best practice guidelines and tools for knowledge transfer and implementation of adaptive water governance

<p><u>Application of national water governance frameworks in basins</u></p> <ol style="list-style-type: none"> 1. Support systematic coordination in implementation of modern water governance practices (G1) 2. Promote strategic planning for IWRM application in basins (G2) 3. Encourage innovative financial solutions (G3) 4. Facilitate transborder cooperation in shared basins (G4)
<p><u>Engagement and coordination among actors & forms of interaction/partnerships</u></p> <ol style="list-style-type: none"> 5. Ensure broader engagement of multiple actors in implementation of BP&T in basins (G5) 6. Diversify mechanisms and tools for interactions, coordination and building partnerships among stakeholders (G6) 7. Capacitate and support formation of river basin organisations as mechanisms for stakeholder engagement (G7) 8. Empower local communities towards implementation of BP&T in basin management (G8)
<p><u>Enabling learning and building adaptive capacity</u></p> <ol style="list-style-type: none"> 9. Enhance monitoring and information management in basins (G9) 10. Provide development of decision-support systems in basins (G10) 11. Improve learning and dissemination of knowledge about uncertainties, risks and opportunities related to climate change impacts (G11) 12. Invest human, administrative and financial resources into enhancing capacity for adaptive water governance (G12)
<p><u>Transfer of best practices</u></p> <ol style="list-style-type: none"> 13. Support wider dissemination and uptake of BP&T across basins and countries as a part of water governance reform (G13) 14. Develop detailed strategies and action plans for selection, transfer and uptake of BP&T (G14) 15. Promote adaptation of imported BP&T to local specifics of recipients (G15)

4.2 Application of national water governance frameworks in basins

Guidelines
<ol style="list-style-type: none"> 1. Support systematic coordination in implementation of modern water governance practices (G1) 2. Promote strategic planning for IWRM application in basins (G2) 3. Encourage innovative financial solutions (G3) 4. Facilitate transborder cooperation in shared basins (G4)

4.2.1 Rationale

Coordination among government authorities, among multiple stakeholders from river basins and cooperation in transborder basins is a powerful tool in good water governance

There is a growing recognition worldwide that a great deal of water problems – and particularly those related to sustainable water use, water protection and natural disasters risk reduction – are rooted in failures to realise good water governance at a basin level. It is becoming a common practice that national water governance frameworks are to be based upon integrated water management in river basins, and they are started to be applied in practice more widely by countries and by stakeholder groups. Also there is a need for coordination of practices of various water authorities and multiple stakeholders within a river basin district.

Existing institutions – diversified domestic legislation, water strategies and plans, standards and norms, water administrations, etc. – in the river basins or countries under study is the key, but not sufficient condition for effective implementation of best practices. In many cases the core reason for failures is not in the design of an institution, or strategic program, but it is rooted within its performance stage. Laws and policies provide a good foundation, but successful implementation hampers. Ineffective implementation of existing laws or water policies is a problem in many targeted regions under study. Particularly important for success is the process of functioning of institutions, implementation of their provisions and rules in every-day practices by multiple stakeholders, as well as overcoming the existing constraints and benefiting from challenging opportunities. At the same time, existing water governance systems need to ensure an essential condition – institutional capacity for BP&T application, as most of them define major roles and rules for the behaviour of various stakeholders. Adequate institutional capacity for the implementation of best practices is among the basic conditions for success in best practices application.

Coordination becomes a powerful tool in good water governance at the river basin level, including institutional coordination – horizontal and vertical between various government bodies as well as coordination, dialogues and partnerships of various actors within a basin. Poor coordination is indicated among major problems in the implementation of BP&T in water governance. Particularly important appears to be horizontal coordination – within all scales of governance, including local, provincial and national levels. Deficiencies in horizontal coordination between stakeholder groups, including coordination of their interests and actions, are the problem. Horizontal coordination is also especially important for adaptive water management, because a great deal of issues need to be coordinated and packaged. Recently, this problem started to be approached in many basins worldwide, but it is true that many gaps exist in practice. For example, in many instances the horizontal coordination tends to be replaced by horizontal competition of government agencies. Coordination within transboundary watersheds is a special challenge.

IWRM is regarded by experts as an example of best practices in water governance. A cautious approach is prescribed for reforms in river basins while introducing the basin management principles and IWRM. Such reforms should be well designed and well planned; in some countries they are the integral elements in perspective national water visions and national water strategies. It is important that IWRM is integrated with sustainable development priorities in the basin. Introduction of practices based on basin management principles, especially in large river basins, is not an easy task. Various kinds of coordination efforts are required. Usually, boundaries of administrative units within river basins do not correspond to the natural boundaries. Technical and scientific questions in water basin management are mingled with administrative management and governance issues. As a result integrated water basin management might be a complex multi-layered institutional problem with a variety of uncertainties, with overlap of competences and many loopholes. The introduction of innovative IWRM practices should take into account a variety of natural factors, as well as the traditions and informal institutions of the territories and locales, especially within the large basins.

Experts recommend not to expect immediate results from institutional reforms and introduction of BP&T in adaptive water governance. Institutions have a long living cycle, and their maturity period might even require decades; after introduction new institutions need time to be rooted into existing local/regional frameworks. The enabling environment and adequate administrative capacities are essential. And for this purpose a certain transit period for their ‘embedness’ is required. This conclusion relates to all levels of analysis, including basins, countries and

targeted regions in general. Recently, in many transition economies and developing countries a great deal of institutions have been reformed or modified, and shortly afterwards they were rejected as ineffective. However, in many cases the reason for their failure was not in shortages of their design, but in the need for a transition period for them to root.

Financial shortages in the application of BP&T are almost a 'standard' complaint relevant to most BP&T implementation. However, experts agree that the major problem is not the lack of financial resources as such, but it is the problem of their mobilisation, allocation and channelling. Competition for access to funding and for control over resource flows is high in most cases. Misuse of funds can be among barriers for BP&T success. Thus, strict control over resource flows, transparency and accountability before the public is essential. Mobilisation of diversified sources of funding including government and non-state sources and capacities is important for successful application of BP&T in river basins. The problem of finance and resource allocation is common to many countries worldwide, and quite often it is not just the technical problem, but a political one. Recently, new financial tools are being more widely applied in river basins to support implementation of BP&T, including those in developing countries. For example, microcredits for rural local population, loans to local communities and municipalities for environmental services and biodiversity conservation, local insurance schemes are used more often, and they provide better access to finance for poor marginalised groups.

The context for BP&T implementation includes both 'natural' environmental specifics and societal factors. Context-specific factors, and particularly societal, are evaluated by experts as one of the important drivers in performance. Their role is especially high in transition economies and in developing countries, while the impact of context specifics might be not that significant in stable societies in the EU. On the contrary, under unstable institutional systems, undeveloped democracies and basic conditions that are far from equilibrium the 'standard' regimes and practices might produce non-standard, unexpected outcomes; they might result in ineffective forms of behaviour and institutional traps. Socio-cultural traditions of societies and existing institutional settings really matter for the introduction of innovative water governance schemes. They need to be thoroughly assessed and taken into account within implementation process.

Among the challenges in best practices application in the regions under study is enhancing cooperation in transboundary basins. Both expanding interactions between the national states and between non-state actors equally matter. Experts underlined that transborder coordination in shared watercourses strongly requires regional cooperation frameworks, which are deficient

today to solve common problems. Coordination practices in transborder basins need to be further promoted. Despite the focus made by Twin2Go on the national parts of shared basins, it is evident that that transboundary problem-solving has to take into account the diversity of countries and issues of transboundary nature, and formulate coordinated responses to them. To meet this goal not only joint international efforts, consensus and capacity building are essential. Refining domestic visions and adjusting them to the agenda for a transborder basin are crucial. Part of the task for decision-makers is to support initiatives and to provide the incentives for multiple actors in the basin to be engaged in transborder interactions. Experts recommend applying a transboundary diagnostic approach, which envisages certain phases including monitoring and data collection for the basin, assessment of priority problems (environmental and institutional), development of strategic action plans and then translating them into compatible national programs.

4.2.2 Recommendations for action

The following table provides an overview of recommendations and activities suggested by Twin2Go in support of its four major guidelines relating to the application of national frameworks in river basins.

Table 9. Overview of recommendations to realise BP&T guidelines on application of national frameworks in river basins

<i>Guideline 1: Support systematic coordination in implementation of modern water governance practices (G1)</i>
<p><i>Recommendation 1.1 Enhance institutional capacities for application of best practices</i></p> <p><i>Lessons learned:</i></p> <ul style="list-style-type: none"> ▪ Establish clear procedures for horizontal and vertical coordination and division of responsibilities between institutions and administrative bodies involved in regulation of water use, water protection and natural disaster risk reduction in river basins ▪ Reduce fragmented institutional set-up and unclear mandate of agencies in water sector ▪ Enhance administrative capacities for best practices implementation through removal of administrative barriers ▪ Promote removal of 'personal' interests in administration and water authorities regarding implementation of BP&T ▪ Ensure accountability about best practices application and transparency of water authorities before their constituents ▪ Introduce mechanisms for verification and control over BP&T implementation ▪ Undertake measures to overcome bureaucratic inertia and lack of professionalism in administrations ▪ Ensure formal ministerial recognition and active support for introduction, application and wider dissemination of BP&T

Recommendation 1.2. Undertake horizontal coordination with clear division of power and responsibilities between government authorities dealing with water

Lessons learned:

- Adopt transparent horizontal division of competences and duties between government agencies dealing with water
- Reduce overlaps and parallelism in authority of ministries regarding regulation of BP&T in the water sector
- Avoid competition among administrations for control over best practices implementation
- Undertake measures towards inter-sectoral and inter-ministerial planning and coordination
- Develop regular communication and exchange between government authorities
- Set up operational coordination mechanisms enabling regular interactions between government bodies and major stakeholder groups

Recommendation 1.3. Define clear competences of water authorities at various levels for BP&T implementation within existing system of vertical subsidiarity

Lessons learned:

- Ensure coordination at the federal and at the local levels among government agencies involved in river basin management
- Use the RBO system as a tool to provide a balance between bottom-up and top-down approaches
- Ensure coordination between government and communities to implement BP&T at sub-basin level
- Provide broader transfer of competences for practical action to the locales (while national authorities set the framework conditions the locales implement BP&T within this framework)
- Promote regional cooperation in river basins with broad engagement of multiple stakeholders

Recommendation 1.4. Develop organisational mechanisms and tools for coordination

Lessons learned:

- Introduce mechanisms promoting dialogue and partnerships between state and non-state actors
- Undertake standard-setting and rules for actors' behaviour applying new practices and tools
- Apply economic mechanisms, motivation and incentives for particular actor groups to support application of new BP&T
- Build coordination between water administrations and RBOs with allocating wider authority to enforce water management and not limiting their mandate only to advisory functions
- Apply the adaptive water governance package for a watershed, including coordination of flood and drought management, hydro-engineering, upstream and downstream water infrastructure, water use, pollution control, ecosystem services, wetlands protection and ecotourism
- Apply coordination of water use and land use practices
- Ensure basin coordination of monitoring, databases, modeling, assessment and decision-support systems
- Make sure to benefit from possible windows of opportunity created by newly introduced water legislation, institutions, strategic plans and reforms in the water sector
- Use the market opportunities, competitiveness and entrepreneurship in the water sector
- Stimulate broader involvement of the science-and-technology community in sharing 'good' water governance knowledge, R&D results and practices

Guideline 2: Promote strategic planning for IWRM application in river basins (G2)

Recommendation 2.1 Develop clearly formulated strategies and plans for IWRM application

Lessons learned:

- Formulate well defined goals and principles for IWRM in specific basins or watersheds
- Introduce realistic short-term and mid-term strategies and practice-grounded water programs for the basin
- Prepare basin management plans with particular time frames and cycles
- Support IWRM strategies with concrete action plans and adopt step-by-step measures for implementation of IWRM in specific basins or watersheds
- Make river basin management plans an important mechanism to coordinate actions of stakeholder groups in water protection and conservation

Recommendation 2.2 Ensure coordination and packaging of IWRM with sustainable development priorities in the basin

Lessons learned:

- Undertake IWRM planning as a part of river basin sustainable development with tight coordination with social, environmental and economic priorities for the basin
- Integrate IWRM strategies with land use planning along river banks
- Ensure IWRM phased strategies and development of catchment management plans – flood, drought, water use, pollution control, etc. – as separate elements in IWRM implementation
- Provide flood risk management integrating all stages of flood control including prevention, mitigation, rescue and rehabilitation
- Introduce the integrated impact assessment of the basin development strategies

Guideline 3: Encourage innovative financial solutions (G3)

Recommendation 3.1. Diversify funding opportunities

Lessons learned:

- Develop an effective system of funding for river basins management
- Mobilise and combine funding from multiple state and private sources to support implementation of best practices
- Diversify forms of financial support, including microfinance, insurance, lending and credits in the water sector
- Undertake measures for improving the allocation of funds by the government
- Seek additional funding to support best practices implementation beyond pilot sites to ensure their success
- Use wider the tools for 'green products' and 'environmentally friendly' incentives towards private water users
- Support application of international market incentives to adopt BP&T by firms

Recommendation 3.2. Use new forms of finance

Lessons learned:

- Apply the microcredits schemes to support local initiatives in rational water use and conservation
- Develop schemes of compensation for restoration and maintenance of ecosystem services
- Provide sufficient compensation for farmers in case retention reservoirs are needed for flood mitigation
- Ensure government support for small innovative projects in the water sector
- Apply public procurement mechanisms in water project financing and implementation
- Introduce 'blue labels' for facilities that contribute to water savings and water pollution re-

- ductions
- Apply awards for outstanding environmental performance, e.g. progressive tax system, benefits through introduction of clean technologies

Recommendation 3.3. Ensure accountability and control

Lessons learned:

- Provide strict control over resource flows
- Ensure measures against corruption and possible misuse of funds
- Increase accountability and transparency in finance of BP&T
- Clearly allocate responsibilities among the authorities for providing financial incentives and funds control

Guideline 4: Facilitate transborder cooperation in shared water basins (G4)

Recommendation 4.1 Develop institutional frameworks for joint actions in transborder watercourses

Lessons learned:

- Promote international bilateral and multilateral regimes involving the riparian countries in shared watercourses
- Develop regional frameworks for transboundary water cooperation, including agreements, commissions and councils
- Develop interactions between actor groups in shared watersheds to reduce existing cooperation gaps
- Ensure the interests, authority and national political identity of the riparian states in coordination and cooperation in transborder watercourses
- Incorporate transborder basin management into national IWRM planning
- Ensure national coordination of policies on transborder basins between water authorities and foreign ministries
- Expand domestic RBOs agenda with a vision not only on national parts of transborder basins

Recommendation 4.2 Diversify coordination tools in transborder watercourses

Lessons learned:

- Initiate and support stakeholder engagement and partnerships in transboundary problem-solving
- Promote community representation in transboundary water management resulting in better understanding of the situation and acceptance of development and conservation plans
- Share between countries and actor groups the domestic experiences, information, lessons learned in water management
- Establish common monitoring, geo-referenced databases, share historical series of hydrometeorological information, ecosystems data, and undertake assessment of impacts and risks
- Assess existing legal and management problems in the shared basin, and discuss specific management models
- Develop joint strategic action plans for the basin
- Formulate domestic programs for joint strategic action plans implementation

4.3 Engagement and coordination among actors and forms of interaction/partnerships

Guidelines

5. Ensure broader engagement of multiple actors in implementation of BP&T in river basins (G5)
6. Diversify mechanisms and tools for interactions, coordination and building partnerships among stakeholders (G6)
7. Capacitate and support formation of river basin organisations as mechanisms for stakeholder engagement (G7)
8. Empower local communities towards implementation of BP&T in basin management (G8)

4.3.1 Rationale

Engagement and partnerships of stakeholders are the essential condition for successful implementation best practices

Participatory approach appears to be a good practice in itself, and also it allows to significantly enhance the BP&T implementation process. A variety of instruments and practices used to widen stakeholder engagement in decision-making processes in water the sector rank from national and regional constitutions, water laws and framework directives to river basin authorities with open policy and local informal institutions. Such instruments as platforms, committees, management councils, etc. especially at the local level can ensure deliberative engagement opportunities. Incentive methods applied in some countries are a good tool for enhancing environmentally benign behaviour of stakeholders.

The Twin2Go inventory contains a great deal of interesting BP&T stories relating to various aspects of stakeholder engagement, and about half of them deal with the application of participatory approaches. Experts indicate that public participation should not be regarded as a goal per se, but as a tool towards good water governance in a watershed. In regions with low public participation it is especially important to stimulate it through public hearings, forums, networking and dialogues. Involvement of a wider range of stakeholders can contribute to problem-solving and improve the common understanding of the situation and acceptance of development and conservation activities. Engagement not only in decision-making, but also in

concrete practical actions in the water sector is a good recipe. Their in-depth and regular participation helps to shape the water governance framework and make its implementation more effective.

Community and local level representation in decision-making, planning and action lead to better water management in all river basins. Early identification of local stakeholders, their interests and capacities to implement BP&T is an important element in enhancing their engagement and partnerships. Identification of major conflicts, or problems local stakeholders are facing can serve as ‘internal driver’, which can often foster local action, even in the absence of higher-level interests. Without the bottom-up initiatives in many cases the top-down framework never ‘touches ground’, or is enacted in practice in a limited number of high-priority pilot zones; balance between top-down and bottom-up approaches is essential. To use, capacitate and empower existing community organisations or social structures like, for instance, the resource user groups to ensure more sustainable and efficient solutions is crucial at the local level. It is becoming the common recognition among experts that local authorities have a societal responsibility not only to establish their broader accountability before the local public in water management, they need to introduce frameworks stimulating broader public and water users involvement in decision-making and action.

Coordination and partnerships between various groups of actors in sustainable water management are a still weak practice in many river basins worldwide. However, during the last decade significant efforts have been undertaken in that direction, and voluntary partnerships and basin coordination in locales is the new emerging trend. Experience shows that such partnerships are more viable for the smaller river basins or sub-basins; they are more functional while establishing coordination between municipalities and locales, rather than involving the regional/provincial levels. Diversified support from policy-makers for such emerging initiatives is of a crucial importance. All kinds of coordination and interactions between multiple stakeholders in the basin need to be encouraged. Building regular state-private partnerships in the implementation of water policies is equally important for effective application of BP&T, especially at the local and provincial levels. Coordinated and diversified incentives for shifts towards sustainable water use and conservation is among effective practices.

Practices associated with establishing the basin council type organisations – River Basin Organisations (RBOs) – along with usually functioning water basin administrations are registered in many basins. The record about their success varies significantly across basins. The creation of RBOs has, overall, increased the opportunities for wider stakeholder

participation. RBOs through meetings of their main committees and working groups as well as through their representation in other events and convening public dialogues at different levels have taken on some of the characteristics of multi-stakeholder platforms. They largely function as focal points for consultation and aggregation of water management plans. Aspirations might be broader. However, most of them are facing problems with finance; some of them are dominated by government authorities. For most part, RBOs still remain nascent organisations with limited capacities to coordinate stakeholder dialogues and actions.

4.3.2 Recommendations for action

The following table provides an overview of recommendations and activities suggested by Twin2Go in support of its four major guidelines relating to stakeholder engagement and partnerships.

Table 10. Overview of recommendations and activities to realise BP&T guidelines on stakeholder engagement and partnerships

Guideline 5: Ensure broader engagement of multiple actors in implementation of BP&T in river basins (G5)
<p>Recommendation 5.1. Undertake stakeholder capacity assessment</p> <p><i>Lessons learned:</i></p> <ul style="list-style-type: none"> ▪ Provide early identification of stakeholders to be engaged in implementation of BP&T ▪ Undertake a detailed survey of multiple interests of actors relating to BP&T application in river basin and their variations ▪ Ensure that authorities know the actors in the basin, listen to their proposals, problems and ideals ▪ Undertake an assessment of stakeholder potential and capacity for BP&T implementation and their limitations and possibilities ▪ Identify potential of stakeholders to contribute to meeting economic and social development priorities in the basin
<p>Recommendation 5.2. Promote stakeholder engagement in decision-making</p> <p><i>Lessons learned:</i></p> <ul style="list-style-type: none"> ▪ Support stakeholder participation in planning and decision-making about BP&T application ▪ Build regular dialogue and consultations within a triangle: ‘authorities – public – business’ ▪ Identify and discuss factors that can be a barrier to application of BP&T by stakeholders ▪ Share opinions about new opportunities for wider application of BP&T ▪ Ensure engagement of stakeholders at early stages as a tool for more transparent decision-making, planning and implementation ▪ Promote wider engagement of women, younger generations and minorities in formulation of basin strategies and plans, participation in local capacity building workshops, internships and site visits
<p>Recommendation 5.3. Diversify mechanisms to ensure actors engagement in action and</p>

problem-solving

Lessons learned:

- Provide motivation, incentives and support for stakeholder engagement in application of new BP&T
- Mobilise additional funding to promote wider stakeholder engagement
- Develop administrative capacity of water agencies and upgrade their limited experience to support public participation and interactions
- Undertake practical action for consensus building measures among stakeholders
- Ensure that 'green image', voluntary certification and adoption of best practices by firms increase their business competitiveness
- Build communication infrastructure and networks to let stakeholders know about the existence of plans, best practices and lessons learned from their application

Guideline 6: Diversify mechanisms and tools for interactions, coordination and building partnerships among stakeholders (G6)

Recommendation 6.1. Promote river basin partnerships and interactions

Lessons learned:

- Develop participatory action networks in a river basin with involvement of various stakeholders
- Support alliances of stakeholders promoting adaptive practices in river basins
- Adopt a 'common goal approach' for application of BP&T in a river basin among the public, business, NGOs and scientific community
- Build state-private partnerships and coordination and ensure principles of continuity and stability in BP&T application
- Disseminate and discuss the success stories, lessons learned and results of partnerships

Recommendation 6.2. Apply diversified coordination tools

Lessons learned:

- Encourage actors' involvement in the implementation of strategic action plans (SAP) for river basins
- Support voluntary regional and local associations involved in water conservation and protection; establish coordination between community water users groups
- Build dialogues, consultation, negotiation, social regulation, multi-stakeholder platforms and networks between authorities and stakeholders
- Encourage scientific and technical informal alliances with participation of multiple stakeholders from the basin
- Coordinate stakeholder interactions in wider application of decision-support tools, existing databases and technical assistant packages in BP&T implementation
- Coordinate mass media involvement in communication and sharing information as a tool to develop stakeholder engagement and partnerships

Guideline 7: Capacitate and support formation of river basin organisations as mechanisms for stakeholder engagement (G7)

Recommendation 7.1. Introduce a participatory institutional system for water basin management

Lessons learned:

- Establish river basin organisations to provide interactions between authorities and communities in application of BP&T
- Introduce procedures ensuring real representation and participation of stakeholders from various groups of water users (NGOs, scientific community, public, business, municipalities, local communities) in RBOs

- Enhance RBO capacity to serve as platforms for stakeholder engagement and coordination of their interests
- Provide sufficient human and financial resources to support RBO activities and to secure broader stakeholder engagement
- Ensure that RBO is an integral component in the government system of water resource management

Recommendation 7.2. Use the RBOs as focal points for building partnerships between the state and society

Lessons learned:

- Make public consultation, dialogues and stakeholder coordination a routine RBO activity
- Identify within the RBO system the coordinators within each sub-basin to provide a bridge allowing government and communities to implement solutions and best practices
- Capacitate RBO to support communities to identify and act towards problem-solving at a grassroots level
- Capacitate RBO to submit river basin projects for funding by the government or external sources
- Support RBOs with trained personnel, adequate technical knowledge, equipment and experience for implementing river basin projects in the locales

Guideline 8: Empower local communities towards implementation of BP&T in basin management (G8)

Recommendation 8.1. Develop institutional settings to ensure communities engagement in BP&T application

Lessons learned:

- Ensure grassroots level public support for BP&T introduction and implementation
- Undertake institutional reforms that provide for broader community participation and representation in basin management, planning and decision-making
- Capacitate local public by regular dissemination of knowledge and information about best practices
- Assess possible options for opposition or support from various stakeholders and advocacy groups to implementation of new projects in the locales
- Make efforts to reduce paternalism of the state in favour of local public action and participation
- Provide institutional and knowledge support for self-governance organs in implementing local water governance reforms

Recommendation 8.2. Promote 'learning by doing' in the locales

Lessons learned:

- Enhance local public awareness and engagement in decision-making and action
- Encourage and support stakeholder participation in identifying local problems and management options
- Decouple formal government management programs from informal voluntary stakeholder projects in order to provide for more local initiatives and experiments
- Organise regular exchange of lessons learned in the locales about BP&T implementation
- Bring new ideas and success stories from new local practices into policies and plans
- Establish and support cooperation between the locals within the basin

4.4 Enabling learning and building adaptive capacity

Guidelines

- 9. Enhance monitoring and information management in river basins (G9)
- 10. Provide development of decision-support systems in river basins (G10)
- 11. Improve learning and dissemination of knowledge about uncertainties, risks and opportunities related to climate change impacts (G11)
- 12. Invest human, administrative and financial resources into enhancing capacity for adaptive water governance (G12)

4.4.1 Rationale

Best Practices for knowledge and information management are essential for water resources assessment and subsequent decisions in adaptive water management

Good water management constitutes a major challenge and calls for integrated and holistic management and planning. New and improved water management tools enable water managers to consider and assess complex issues when managing the available resources and planning for the future.

Use of water management tools enables users and decision-makers to focus on the transparency and accessibility of results to relevant stakeholders involved in and interested in environmental and water resources issues.

Integrated knowledge management systems have shown value in providing overview and structure of data and information and in providing a basis for transforming data and information into knowledge.

Decision Support Systems (DSS), which integrate knowledge and information, have proved their value in integrated management in providing a timely, transparent and well informed and reproducible basis for decision-making. DSS frameworks have shown to be capable of supporting and providing information (costing and prioritisation) for project feasibility and planning as well as design and implementation.

Information and knowledge to manage risks in the light of increasing uncertainties require transformation processes in institutional resource regimes and management style (Pahl-Wostl, 2007), this must be taken into account when managing water.

Water resource managers have significant experience in successfully planning and operating their systems in the face of uncertainty regarding future hydrology, weather, available water supply and projected water demand. In recent years, however, it has become clear that today's planning approaches may no longer be adequate. Dynamic population and economic growth have placed increasing pressure on water supplies, and concerns about environmental impacts have grown.

In addition, the potential for climate change has confronted water managers with an additional novel challenge. While in any particular service area the precise impacts of climate change for temperature, precipitation, evaporation, storm water capture, and imported supplies remain deeply uncertain, it has become increasingly clear that past weather and hydrological records no longer provide an accurate guide to future weather and hydrology.

4.4.2 Recommendations for action

The following table provides an overview of recommendations and activities suggested by Twin2Go in support of its three major guidelines relating to enabling learning and capacity building.

Table 11. Overview of recommendations and activities to realise BP&T guidelines on BP&T on learning and capacity building

Guideline 9: Enhance monitoring and information management in river basins
<p>Recommendation 9.1 An efficient data collection system with clearly described procedures and quality assurance enhances the value of monitoring and information management system</p> <p>Lessons learned</p> <p><i>Lessons learned:</i></p> <ul style="list-style-type: none"> ▪ Policy makers should appreciate the importance of reliable and representative data, address eventual legal constraints in data-sharing and create the necessary institutional responsibilities and make appropriate allocations of financial and human resources reflecting local needs. ▪ Prioritisation of data needs based on key water issues and assessment of risks and damages can help to develop political support and resources. ▪ Collection of data by a number of different organisations requires compatible systems in terms of standards, quality assurance, electronic access and transfer. ▪ Quality assurance is essential for the usefulness of the knowledge base and in particular in transboundary situations where mutual confidence building and credibility is essential. <p>Recommendation 9.2 The design of monitoring and information management systems</p>

should be based on a careful assessment of the water resources issues to be managed

Lessons learned

Lessons learned:

- A water resources assessment often needs to be carried out in several steps of increasing complexity. A rapid water resources assessment may help identify and list the most important issues and identify priority areas. On the basis of this early assessment, more detailed investigations may be required.
- Examination of changes in land use and possible soil degradation as well as climate variability and change, should be part of larger water resource development schemes.
- Careful analysis of developments in a river basin in order to ensure both quantity and quality protection.

Guideline 10: Provide development of decision-support systems in river basins

Recommendation 10.1 Development of information management system which can arrange, store and exchange data in an electronic form is a valuable tool for decision making

Lessons learned:

- *Geographical information systems (GIS)* bringing together data and information for decision-makers for water planning and management can integrate a range of relevant data and information like e.g. on settlement, land use and natural resources in a water catchment, and identify relationships between the data. With visualisation technology, GIS can allow the user to create images of a water catchment.
- The use of an information management system can lead to better and more consistent decisions.
- Ease of access and a flexible design will allow users to adapt to new information needs over time.
- User perceptions are not easy to store in an information management system.

Recommendation 10.2 Decision Support System (DSS) collecting data from many sources can inform a decision process

Lessons learned:

- *Modelling* is often an element of a DSS, which can integrate the hydrological, technical, ecological, environmental, economic, social, institutional and legal aspects of water problems into a coherent framework. Models are presently best developed for hydrological aspects, while for most other water aspects (ecological, environmental, economic, social, institutional and legal) there is room for improvement.
- Putting models on the Internet in user-friendly form makes model inputs and outputs available for peer review; facilitates improvements in modelling in future projects, and ensures that future work can build on past research.

Guideline 11: Improve learning and dissemination of knowledge about uncertainties,

risks and opportunities related to climate change impacts

Recommendation 11.1 Learning and dissemination of climate change and its impacts is essential for water management

Lessons learned:

- Although the experience in developing policies for climate change adaptation that build on better water resources management is still in its infancy, elements of successful water policies can be used as a solid basis for adaptation policy options
- Global warming and related climate changes are predicted to significantly influence the water environment in the coming decades. Water resources managers have long been used to dealing with monthly and annual variations. But the situation where progressing climate changes are highly likely is new, and it requires a pro-active, rational adaptation policy.
- Strengthening of water resources institutions accumulating information and capacity to predict, plan and cope with present and future climate changes and developing long-term resilience strategies is essential.
- Climate change information in relation to floods can be made available to local people and increase their awareness and coping capacity.
- There is a need for sound science results and best practices experience as foundation for adaptation decisions; also improving and sharing knowledge and information and building comprehensive and sustainable data collection and monitoring systems is required.

Guideline 12: Invest human, administrative and financial resources into enhancing capacity for adaptive water governance

Recommendation 12.1 Institutional capacity building is a means of enhancing performance.

Lessons learned:

- Capacity in institutions is needed to plan, to regulate, to provide services and to allocate resources.
- Appropriate policy and legal framework, financing system, organisational framework and adequate management instruments require availability of sufficient information and expertise as well as incentives to function effectively and efficiently.
- Capacity building programmes should be preceded by an assessment of both existing capacity and the proposed management tools. In addition to the human capacity, which is the focus of this set of tools, capacity means a whole range of physical resources – for example, monitoring equipment, a computer or a vehicle to enable regulators to visit sites for inspection.
- Capacity building is needed at many levels: in civil society, for water professionals in all areas – both public and private water organisations, local and central government, water management organisations and in regulatory organisations.
- Organisational development may be needed to ensure that water management organisa-

tions and their managers are open to new ideas and are willing to accept public input and the need to co-operate with other stakeholders

4.5 Transfer of Best Practices

Guidelines

- 13. Support wider dissemination and uptake of BP&T across river basins and countries as a part of water governance reform (G13)**
- 14. Develop detailed strategies and action plans for selection, transfer and uptake of BP&T (G14)**
- 15. Promote adaptation of imported BP&T to local specifics of recipients (G15)**

4.5.1 Rationale

Wider exchange of best practices in water governance across river basins and countries promotes effectiveness in water management

Many best practices in water governance applied today in river basins worldwide are the result of their international exchange across countries, shared watersheds, or the result of domestic dissemination across basins in the same country. The role of international transfers has been growing due to globalisation, international cooperation and efforts of international agencies promoting diffusion of best institutional practices. There is also a stable trend towards international unification and standardisation of water governance instruments and tools in adaptive water management. At the same time, ongoing national water reforms aim at increasing the effectiveness of water institutions, and some of them are borrowed and transferred from other locations.

Usually, the most effective and innovative practices are transferred internationally: typically, developing countries and transition economies borrow water governance institutions from developed countries in order to speed up their reforms in the water sector. However, a cautious approach should be applied against simplistic transfers of successful elements to other international locations. There are numerous examples that institutions that are effective in one societal system might be useless, or result in implementation gaps in the other. Implanting innovative water governance regimes and practices into institutional systems that differ from those in river basins of donor countries, or into outmoded institutional settings in recipients can

be unsuccessful and produce non-standard and unexpected results. The major problem is that transplanted institutions often are not able to root properly into a different institutional, economic and socio-cultural context, while their fit into the existing societal specifics of a recipient is essential. Thus, the important issue is how to better select the proper transplants to increase their compatibility. What principles ensuring effective transfers and what transfer technologies should be applied? This is a very difficult and challenging task.

Among problems is that the transfer of best practices in water governance is a highly context-dependent process. This relates both to the societal and natural context of the destination. The role of context-specific factors defining options and risks associated with this process is especially high when there are significant differences in the societal frameworks in the donors and recipients. Context needs to be scrupulously taken into account. Finding ways to fit into the context – to benefit from a variety of institutional, economic and socio-cultural opportunities along with overcoming existing barriers – is the crucial part of the policy process. Compatibility of institutional transplants with local settings is a precondition for success of water governance reforms.

Adaptation of imported institutions to situational factors, to the local domestic specifics – both exogenous and indigenous to the water sector – is usually required. Without adaptation there is a risk that during implementation the transplants might produce more modest results than envisaged at the start of reforms. There is even a danger that transplants might be deformed and become ‘unrecognisable’ after severe alterations to fit local socio-economic, institutional and natural settings, and might lose their effectiveness. Thus, there are limitations to the scope of transferred practices adaptations to situational specifics until the transferred tool is distorted, loses its effectiveness and starts producing unexpected non-standard results. Careful selection of ‘transplants’ and design of a transplantation strategy usually envisaging gradual adaptation of new institutional practices, their further development and rooting within the recipient’s social and natural environment is of utmost importance. Moreover, not only imported institutions and best practices need to adapt to the local context – local actors also have to adjust to newly imported institutions. A transplantation strategy needs to reflect all these nuances.

Another challenge within the transfer process is that an assessment and design of a possible institutional trajectory and a clear strategy of transfers is essential, while several consecutive stages of a water reform are advisable. Gradualism instead of “shock therapy” ensures higher success of institutional reforms and new regime formation. A transition period provides for better adaptation of new water governance systems, reduction of transformation costs, avoiding

possible institutional distortions and implementation gaps. In many cases transfer strategies envisage a set of interim institutions that gradually develop within the context of a recipient towards the desired institutional options.

Enabling domestic frameworks are an important precondition for success: legal frameworks, stakeholder engagement, human, institutional and administrative capacity, financial and technology resources, as well as strategic planning promote effective implementation and adaptation of imported BP&T. Sometimes, decisions about transfers made at the national level might interfere with the local priorities and might face opposition from local stakeholders; coordination is particularly important, as there is a need for consent and support for transplants from the real ‘implementers’ at the bottom.

4.5.2 Recommendations for action

The following table provides an overview of recommendations and activities suggested by Twin2Go in support of its three major guidelines relating to transfer and adaptation.

Table 12. Overview of recommendations and activities to realise BP&T guidelines on transfer and adaptation

Guideline 13: Support wider dissemination and uptake of BP&T across river basins and countries as a part of water governance reform (G1)
<p>Recommendation 13.1. Coordinate and integrate BP&T transfer into water policies and reforms</p> <p><i>Lessons learned:</i></p> <ul style="list-style-type: none"> ▪ Ensure selection of transplants that fit into national water agendas and sustainable development priorities ▪ Provide integration of transplants into national water governance reform ▪ Provide broader exchange of success stories and instruments in transfer of BP&T internationally common today for their export-import flows (<i>including RBO models, IWRM instruments, adaptive water governance systems, polluter pays principle, decision support systems, etc.</i>) ▪ Promote dissemination of BP&T in shared water basins across riparian countries in the targeted regions ▪ Discuss and exchange local lessons learned about domestic dissemination of BP&T within the country ▪ Support transfer of innovative policies in adaptive water management <p>Recommendation 13.2. Ensure active stakeholder engagement in BP&T transfer</p> <p><i>Lessons learned:</i></p> <ul style="list-style-type: none"> ▪ Assess local needs and interests in import and uptake of new institutional BP&T ▪ Evaluate local opportunities and barriers for uptake of new institutional practices ▪ Undertake integrated stakeholders capacity assessments in recipients’ river basins as a

- part of transfer strategy
- Ensure wider involvement of actors in BP&T transfer and implementation
- Undertake measures to coordinate actors' multiple interests and to build consensus among them about implementation of transferred practices
- Support interactions and building partnerships among actors

Recommendation 13.3. Promote international dissemination and unification of standards in application of BP&T and national compliance with international norms

Lessons learned:

- Promote domestic uptake and application of international standards and norms (voluntary and obligatory)
- Develop road maps for harmonisation of national legislation with existing international standards and norms
- Encourage application of tools aimed at enhancing 'green image' of local business widely applied for consolidating its international competitiveness and wider use of market opportunities
- Diversify tools for national compliance with international agreements and norms
- Ensure verification and control over implementation of international norms and compliance with international standards

Guideline 14: Develop detailed strategies and action plans for selection, transfer and uptake of BP&T (G2)

Recommendation 14.1. Undertake BP&T transfer according to clear strategies and action plans

Lessons learned:

- Apply phased strategies and action plans
- Ensure gradual transfer and embedment of imported institutions into the existing water governance system
- Promote monitoring and feedback mechanisms about realisation of transfer strategies and action plans
- Enact strategies envisioning the dissemination of knowledge, know-how and lessons learned among stakeholders to engage them in discussion of challenges associated with the application of new practices

Recommendation 14.2. Develop and apply transplantation strategy and know-how

Lessons learned:

- Formulate and adhere to principles of BP&T selection that reflect the destination specifics
- Ensure that the transplantation strategy is properly structured and incorporates several phases, including
 - ✓ selection of a transplant and its transfer strategy
 - ✓ formation of transplantation infrastructure, including development and lobbying of the new laws, establishment of interim institutions to enact its transfer
 - ✓ realisation of adaptation measures
 - ✓ management of transfer process
- Apply verification, control and reporting for BP&T implementation
- Provide public control for realisation of new practices to avoid misuse of resources allocated to transfers as a result of bureaucratic competition of government agencies
- Promote international support for transfer of BP&T between developed and developing countries

Recommendation 14.3. Build domestic capacities and follow-up support for implementation

of transferred BP&T

Lessons learned:

- Provide political and administrative support from the government and water authorities at various levels for the import of new institutional practices
- Provide the follow-up financial, human and technical resources to ensure success in the implementation of transplanted practices
- Ensure organisational back-up – supporting infrastructure in the water sector, river basin organisations and water research institutes that are involved in implementation of transferred BP&T
- Build and promote local information networks, community-based organisations, platforms, or user groups

Recommendation 14.4. Assess BP&T institutional fit between context in donors and recipients

Lessons learned:

- In selection of transplants take into account the political, institutional, economic, social and cultural context of recipients in order to avoid transfer failures
- Take into account the compatibility of natural environment and sustainable development priorities in donor and recipient
- Undertake conflict analysis of transplants versus existing local formal and informal practices
- Assess correlation of institutional, socio-cultural and capacity characteristics of recipients and donors
- Ensure compatibility of transplants with societal organisation and governance systems – internal and external to the water sector
- Verify that transplants do not significantly contradict to existing informal practices in recipients
- Undertake test runs for the selected transplants in the locales to fit into the destination's societal and biophysical environment

Guideline 15: Promote adaptation of imported BP&T to the local specifics in recipients (G3)

Recommendation 15.1. Formulate adaptation policies for BP&T transfer

Lessons learned:

- Ensure that adaptation options are assessed and incorporated into the transfer strategies
- Avoid 'shock therapy' in a course of transfers in favour of gradual adaptation process and further development of transplant in the new environment
- Ensure that regions, basins and countries find their own specific ways and means for adaptation processes rather than following narrowly prescribed recipes
- Formulate adaptation policies that allow finding ways to benefit from a variety of institutional, economic and socio-cultural opportunities together with overcoming existing barriers and limitations

Recommendation 15.2. Provide adaptation to local context in the recipients

Lessons learned:

- Ensure that BP&T adaptation to local context is a crucial element of the transfer strategy, particularly in cases of different societal and natural environments
- Ensure that context-specific factors are properly assessed and incorporated into adaptation policies decision-making
- Assess in detail the compatibility of existing domestic frameworks of donors and recipients – in the water sector and outside the water sector (social, economic, political, cultural)
- Formulate adaptation measures and tools depending on the context

Recommendation 15.3. Create a package of methods and tools to promote adaptation*Lessons learned:*

- Build domestic capacities for effective adaptation
- Create chains of interim institutions supporting the rooting of transplants and their gradual adaptation
- Ensure economic incentives for stakeholders for gradual uptake and adaptation of transplants
- Undertake monitoring over the adaptation process
- Ensure special adaptation control to avoid implementation gaps during transfers from countries with developed democracies into countries with low civil culture
- Avoid extreme scales in modifications of transplanted institutions to avoid their deformations and implementation gaps
- Undertake measures to ensure adjustments of local actors' behaviour to newly imported practices and institutions
- Provide consulting services and know-how tools promoting BP&T adaptation
- Verify the results of adaptation with the effectiveness of institutions in donor countries

5 Conclusions

5.1 Distilling Key Lessons

Identifying, transferring and modifying best practices to fit to the context of different places and countries is challenging given the diversity of quests in existing water governance systems around the world. Nevertheless, through discussions and consultations with experts in the Twin2Go project we were able to extract a few key lessons learned about the application and transfer of best practices in water governance. We offer these initial insights as propositions for further scientific exploration and for consideration by decision-makers. Together we believe that these kinds of messages will be important in improving adaptive water governance.

(1) Water governance reforms. There is a growing recognition worldwide that a great number of water problems are rooted in governance failures. Global changes increase the pressure on water governance systems to effectively adapt and respond to change. Often, significant reform is needed to make space for innovative best practices and tools that make governance more adaptive regardless of whether you are in developing countries, transition economies or industrialised economies. Reforms are also needed to address implementation gaps – it is not sufficient to simply have water legislation or agencies in place. As reform must start with existing policies and institutions, it is important to design a clear institutional trajectory and strategy for change, perhaps in a series of steps, allowing for adjustment and negotiation. Immediate major results from reform that brings in best practices and tools should not be expected, as it takes time for adjustment of roles, responsibilities and frameworks, embedment of new institutions into existing context. In many locations step-wise approaches are more likely to succeed than “shock therapy”.

(2) Adaptive water governance. The threat and impacts of climate change act as an incentive for more adaptive approaches to water governance. Floods and droughts, coastal surges and erosion, degradation of permafrost and melting of glaciers, as well as associated changes in ecosystems and the services they provide often challenge existing management strategies. The scope of best practices with respect to adaptive water governance applied varies significantly across countries. European countries have been the most active, as climate change is at the top of their environmental agenda, and there is capacity to perform actions induced by climate-change-related risks. Elsewhere, adaptation to climate change is not yet fully on the water governance agenda but a topic for further study. Adaptive water governance concepts are also not familiar and in some cases challenge existing management models.

(3) Integration and coordination. Poor coordination – among authorities, stakeholders or countries – is a common problem in applying best practices and tools. A common expectation is that IWRM frameworks have already dealt with these issues, but in practice this is often not the case, in part, because administrative and basin boundaries rarely align. In larger basins, issues of vertical coordination also arise, and horizontal ones become more complicated. Special attention is therefore needed with respect to how coordination is to be achieved in the implementation of best practices, or they are unlikely to succeed.

(4) Stakeholder engagement and partnerships. Stakeholder participation is a powerful tool in good water governance and often crucial to implementation of best practices. Engagement is important not only in decision-exploring and -making, but also in taking actions. In many developing countries, environmental awareness of the public remains modest, and the sense of responsibility to take actions with respect to water management is still low, as there is a history of expectations or dependency ‘paternalism’ of the government authorities. Broader involvement of civil society actors is critical for ensuring transparency and accountability of bureaucracies and business. Local representation in decision-making leads to better water management in river basins. Early identification of local stakeholders, their interests and capacities to implement BP&T is important. Without bottom-up initiatives top-down frameworks rarely go beyond pilot projects and never touch the ground. Coordination and voluntary partnerships between various groups of actors within basins are an emerging trend and can be expected to contribute to success in BP&T application. Experience, however, shows that partnerships are more viable in smaller river basins, or sub-basins as they are better able to establish coordination mechanisms. Diverse instruments – platforms, dialogues, consultations, public hearings, forums, joint assessments, committees, management councils, joint actions and networks, etc. – can provide deliberative engagement opportunities and encourage coordinated actions that enhance adaptive capacity in water management.

(5) Taking context into account. The findings from our quantitative comparisons in Twin2Go demonstrate correlation patterns between performance and context (natural and societal), while also suggesting that some regime features are important across all contexts (see Deliverable 2.3). The overall features such as polycentric governance structures, for example, can be guiding principles, whereas the details of implementation and best practices chosen to do so, need to be tailored to context. Further analysis of existing practices here, however, underline that success of any water governance reform or change to best practices depends on

scrupulously taking into account the details of context and not just broad patterns of development context. In particular, it depends on the societal specifics, including technological, resource and institutional opportunities and limitations, parameters of human capital and civil culture. The existing so-called situational factors are evaluated by experts as one of the important pre-requisites and drivers in BP&T application, especially in transition economies and in developing countries. As their role is often important, detailed assessment is recommended before policy decisions are made about particular best practices and tools. Our analysis shows how particular contextual factors help explain success or failure of attempts to introduce and apply best practices. We analysed sets of eight types of contextual factors (political, institutional, financial, organisational, social/cultural, informational, infrastructural, environmental) and barriers and opportunities they raise. Political factors were more often seen as barriers than opportunities for new practices. Bureaucratic inertia, vested interests and lack of capacity were formidable barriers to best practices. Disparate interests among key stakeholders in water resources development were not unusual and might make consensus hard to achieve. Changes in government and other forms of political instability were frequently identified as difficult barriers to overcome resulting in delays, changes in direction and “loss of political support” and funding.

(6) *Financing best practices.* Financial shortages in introducing and applying best practice and tools were a recurrent concern of experts. Introduction of new adaptive water governance practices sometimes clearly require more funding than was initially secured. However, in many cases the major problem was not the lack of financial resources as such, but their allocation. Competition for access to funding and for control over resources was high in most cases. Misuse, corruption and poor allocation of funds by government were a major barrier. The problem of finance and resource allocation was common to many countries worldwide, and quite often it was not just the technical problem, but a political one.

(7) *Transfer and adaptation.* Transfer and exchange of best practices is the red thread in transitions towards adaptive water governance. A common pattern is for developing and transition economies to borrow what seem to be effective water institutions from developed countries. International agencies and foreign assistance often play an important role. International norms reinforce identification and sharing of best practices. In other cases transfers across basins in the same country or between riparian states and locales within shared watersheds were observed. Our review of best institutional practices cautions against simplistic transfers of successful elements of water governance to other locations: successful transplantation invariably requires modifications in the details to fit local socio-economic, institutional, political and biophysical settings of recipient locations. Taking into account local

conditions is clearly a crucial dimension of successful transfers of institutional best practices. The process of best practices transfer becomes highly context-dependent, especially when there are significant differences in the societal frameworks in the donors and recipients. Attempts to borrow and directly implant new elements into institutional systems that differ from those in basins of donors, or into outmoded institutional settings, are often unsuccessful. At the same time adaptation and over-modification of a practice or tool to make it fit risks distortion to the point it loses its effectiveness and starts producing non-standard results that may be contrary to initial expectations or intentions. In such cases, paying particular attention to the implementation phase matters in order to avoid failures. Cautious selection of practices based on multifactor analysis, development of the details and phases in transfer and adaptation strategies, monitoring over their realisation, as well as following the principles of gradualism during implementation are suggested.

(8) *Exchange of knowledge and lessons learned.* Best practices that enable learning and address uncertainties result in increased adaptive capacity in basins. Those ensuring knowledge and information management, providing open access to data by stakeholders, dissemination of monitoring results, integration of different kind of knowledge and dealing with uncertainties support adaptation of the water sector to global changes. Our inventory of best practices shows that monitoring networks and good quality data management systems greatly help in water resource assessment and taking subsequent decisions. It is widely appreciated that understanding of water balances is often critical to effective allocation. At the same time the importance of deliberation and negotiation cannot be ignored, as the interests, entitlements, values and capacities of stakeholders often diverge. In other instances there is clearly important local and practices-based knowledge that can inform assessments of vulnerabilities and how to respond to them. In most basins, there is still a lot of work needed to effectively integrate knowledge from different sources in support of effective action.

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8 Annexes

8.1 BP&T: Inventory Questionnaires and Summary table forms

Format-1

Questionnaire for Experts: Inventory of BP&T in water governance

(experts are kindly asked to bring the prepared stories about BP&T to the regional workshop)

Section I. BP&T APPLIED

1. What exactly was the best practice or tool?
2. With what purpose and reason of its application?
3. Who applied it (i.e. authorities, water-users, civil society, international agencies), and what stakeholders were involved?
4. Were any regulatory enforcement and incentive mechanisms used to support BP&T application?

Section II. CONTEXT FOR BP&T IMPLEMENTATION

5. What were the major socio-economic or political constraints/barriers for BP&T application?
6. What were the major constraints/barriers rooted in domestic water governance designs?
7. What were opportunities and drivers for BP&T application?

Section III. PERFORMANCE and EFFECTIVENESS

8. What was the degree of success, or failure in BP&T application in the river basin?
9. Did application of BP&T result in further development of capacity (regulatory, administrative, human, etc.) for adaptive water governance in river basins?
10. Did application of BP&T result in changes towards more adaptive behavior of stakeholders?
11. Did application of BP&T contribute (and to what possible extent) to problem-solving, or its mitigation)?

Section IV. EXPORT- IMPORT of BP&T ACROSS COUNTRIES and BASINS

12. Examples of BP&T transferred across countries, river basins and stakeholder groups
13. Did BP&T transferred required adaptation (and to what extent) to local context and domestic specifics?
14. What were the major barriers and opportunities for transfer and adaptation of BP&T?
15. What was the 'external' influence in your BP&T implementation?

Section V. RECOMMENDATIONS about MAJOR CHALLENGES for the REGION

Format-2

Summary of BP&T from Expert Working Groups

BP&T Examples	BP&T Applied				Context		Performance	
	Major purpose	What is done	Actors involved	Incentive/enforcement	Barriers/constraints	Opportunities/drivers	Success stories	Problems encountered
Focus 1: Application of national water frameworks in river basins								
1.								
2.								
3.								
Focus 2: Engagement and coordination among actors, forms of interaction/partnerships								
1.								
2.								
3.								
Focus 3: Enabling learning and building adaptive capacity in water governance								
1.								
2.								
3.								
EXPORT-IMPORT of BP&T								
1.								
2.								
3.								

8.2 Summary Tables for Four Targeted Regions

List of BP&T Inventory by Experts from 4 Regions⁸

INVENTORY (experts) Of Best Practices and Tools in Water Governance Russia/NIS				
No.	BP&T	River basin/Province/Country	Region	Focus
1	<i>Reprofiling of urban riverside territories from industrial to business-administrative sites</i>	Volga/Russia	Russia	Nº1
2	<i>Relaxation of procedures and removal of administrative barriers in issuing water use permits</i>	Russia	Russia	Nº1
3	<i>Introduction of integrated river basin management within Amu Darya river basin, Uzbekistan</i>	Amu Darya/ Uzbekistan	NIS	Nº1
4	<i>Vetluga river basin: Coordination practices in implementation of basin agreements at the local level (N.Novgorod, Kostroma oblasts, and Mary-El republic)</i>	Vetluga /Nizhegorodskaya oblast/Kostroma oblast/Mari-El republic/ Russia	Russia	Nº2
5	<i>Implementation of Environmental Development Strategy by Cherepovets Chemical Group FosAgro (Ammophos, Cherepovets Azot, Agro-Cherepovets)</i>	Vologda oblast/ Russia	Russia	Nº2
6	<i>Introduction of international environmental management system ISO 14001 by industrial enterprise</i>	Vologda oblast/ Russia	Russia	Nº2
7	<i>Flood monitoring and forecasting in Nizhegorodskaya oblast, Russia</i>	Volga/ Nizhegorodskaya oblast /Russia	Russia	Nº3
8	<i>Hydrodynamic GIS modeling of the Volga river basin (Tver-Cheboksay section)</i>	Volga/Russia	Russia	Nº3
9	<i>Enhancing dissemination of information on water supply of rural areas to decision-makers</i>	Yaroslavl oblast/ Russia	Russia	Nº3

INVENTORY (experts) Of Best Practices and Tools in Water Governance AFRICA				
No.	BP&T	River basin/Province/Country	Region	Focus
1	<i>Compensation for restoring and maintaining ecosystem services especially in times of food insecurities</i>	Niger river basin	Africa	Nº1
2	<i>Leveraging national water priorities to support transboundary cooperation</i>	Lake Victoria Basin/ Kenya	Africa	Nº1
3	<i>Bottom-up approach for stakeholder participation in trans-boundary river basins</i>	Orange-Senqu river basin/ Botswana, Lesotho, Namibia and South Africa	Africa	Nº2
4	<i>Early stakeholder mapping for improved operationalization of the Limpopo Agreement</i>	Limpopo river basin/South Africa, Botswana, Zimbabwe, Mozambique	Africa	Nº2
5	<i>Creating an enabling environment through inclusive and equitable knowledge and capacity building</i>	Orange-Senqu river basin/ Botswana, Lesotho, Namibia and South Africa	Africa	Nº3
6	<i>Establish initially a research based basin-wide knowledge system to focus the work of the basin commission on real issues and provide a learning process based on the use of the research base and platform established</i>	Okavango river basin/Angola, Botswana, Namibia	Africa	Nº3

⁸ The BP&T examples were provided by experts within the scope of the four regional best practices workshops. Further BP&T examples were provided by Twin2Go partners and can be found in annex 8.5, which is attached as a separate file to this report.

INVENTORY (experts)
Of Best Practices and Tools in Water Governance
from SE Asia

No.	BP&T	River basin/Country	Region	Focus
1	Irrigated agriculture	Brahmaputra River in Assam/ India	SE Asia	Nº1
2	Safe drinking water	Brahmaputra River in Assam/India	SE Asia	Nº1
3	Water quality control in Prachinburi River basin	Prachinburi River basin/Thailand	SE Asia	Nº1
4	Climate Change Adaptation and Disaster Risk Reduction, Bagmati Basin	Bagmati River/Nepal	SE Asia	Nº1
5	Koshi River Basin Management Strategy	Koshi River/Nepal	SE Asia	Nº1
6	Implementing IWRM through RBO in Vietnam	Red River/Vietnam	SE Asia	Nº1
7	Flood control and river bank erosion in Assam	Brahmaputra River in Assam/India	SE Asia	Nº2
8	Hydropower in Assam	Brahmaputra River in Assam/India	SE Asia	Nº2
9	Participatory water allocation at Bangpakong and Prachinburi River basin	Bangpakong and Prachinburi River basin/Thailand	SE Asia	Nº2

INVENTORY (experts)
Of Best Practices and Tools in Water Governance
from LAC

No.	BP&T	River basin/Country	Region	Focus
1	Integrated and participative planning with socio-environmental focus	Guayas (Ecuador)	LAC	Nº1
2	National strategy for integrated river basin management - pilot initiative for the Baker Basin	Baker (Chile)	LAC	Nº1
3	A "grassroots" initiative creating a River Basin Committee for the Brazilian part of the Quarai-Cuareim Basin	Quarai (Brazil)	LAC	Nº2
4	Joint Public-Private A Partnership for Water Quality Modelling, arising from international cooperation and given continuity & sustainability by means of a Public-Private Partnership	Biobio (Chile)	LAC	Nº2
5	Participative preparation of a Territorial Planning, Development and Management Plan for the Binational Basin	Catamayo-Chira (Ecuador-Peru)	LAC	Nº2
6	Multi-sectoral collective environmental diagnostic for the Basin	Alto Cauca (Colombia)	LAC	Nº2
7	Construction of a transboundary, basin-wide, shared, georeferenced database and modeling application for Decision Support	Quarai-Cuareim (Brazil-Uruguay)	LAC	Nº3
8	Capacity-building for irrigation canal users	Biobio (Chile)	LAC	Nº3
9	Binational coordinated effort to conduct a diagnostic analysis and participative planning involving all stakeholders	Titicaca (Bolivia)	LAC	Nº3

8.3 Best Practices Coding

Table 13. Best practice and workshop report document case codes:

Code – Case File Name	Code – Case File Name
01-BhutanBPInv3PreWS	30-Nepal-Drinking-Pre
02-Bhutan-Various-Pre	31-Nepal-Kosi
03-Bhutan-Wang-Pre	32-Russia-RiverBasins
04-Bolivia-TiticacaBP1	33-Russia-VetllugaPlus-Local
05-BotswanaPlus-Okavango	34-Russia-Volga-deindust
06-BotswanaPlus-Orange	35-Russia-Volga-FloodForecast
07-Brazil-CuareimBP1	36-Russia-Volga-FosAgro
08-Brazil-QuaraiBP1	37-Russia-Volga-HydroGIS
09-Chile-BakerBP1	38-Russia-Vologda-ISO
10-Chile-BioBio-CanallIrrigation-BP2	39-Russia-Yaroslavska-Info
11-Chile-BioBio-Monitoring-BP1	40-Thailand-BangPakong-Combined
12-Colombia-AltoCaucaBP1	41-UK-Thames-Pre
13-Ecuador-CatamayoBP1	42-Uzbekistan-AmuDarya
14-Ecuador-GuayasPB1	43-Vietnam-Red-Combined
15-Germany-Rhine-Pre	91-AfricaBPInv6-DiscRecommends
16-Hungary-Tisza-Quality-Pre	92-AsiaBPInv6-DiscRpt
17-Hungary-Tisza-Stakeholder-Pre	93-LatinAmericaWSRpt
18-Hungary-Tisza-StakeNW-Pre	94-RFWorkshopRpt
19-Hungary-Tisza-Vasa-Pre	
20-India-Drinking	
21-India-FloodCtrl	
22-India-Hydro	
23-India-Irrigation	
24-Kenya-LakeVictoria	
25-SouthAfricaPlus-Limpopo	
26-Mali-Niger	
27-NamibiaPlus-Okavango	
28-NamibiaPlus-Okavango-Pre	
29-Nepal-Climate	

Table 14. Main NVIVO codes used for the analysis

Level 1 Codes	Level 2 and 3 codes
Recommendations	
	Engagement and coordination among actors
	Enabling learning and building adaptive capacity
	Applying national water frameworks in river basins
	Limitations of study
Coalitions and networks and advocacy	
Purpose, rationale, or justification for applying BP	
	Improve incomes, secure livelihoods, lift living standards
	Overcome institutional barriers and improve water governance

	Strengthen Integrated basin or catchment management or planning
	Enable community, local or public participation in basin management
	Improve environmental quality and make use of natural resources more sustainable
	Build trust or improve cooperation among stakeholders
	Protect people and property more effectively from floods
	Establish or extend or improve safe drinking water supply
	Improve knowledge, databases and information, and decision-support systems
	Improve water quality by identifying pollutant sources and reducing discharges
	Expand access to sewerage and improve waste water management
	Identify and promote alternative approaches to flood protection
	Expand or improve irrigation infrastructure
	Reduce risks of and impacts from droughts
How applied	
	Appropriately designed infrastructure built with improved technologies and equipment
	Dialogue workshops and roundtables
	Extension support to new land-use practices
	Training workshops and related capacity building activities
	Assessments or reviews of existing knowledge
	Modelling and scenario analysis
	Institutional reform
	Negotiation among stakeholders and partners
	Drafting of action plans
	Registration, regulations, licenses and fees
	Improved project management or communications
	Creation of nature clubs
	Stakeholder interviews
	Payments for services
	Pilot projects
	Study visits to other locations
Constraints or barriers	
	Institutional, legal and regulatory constraints
	Political constraints
	Financial or economic constraints
	Information and knowledge constraints
	Infrastructural and technical constraints
	Organisational and human resources constraints
	Social constraints
	Environmental or resource constraints
Stakeholders	
	Applier or convener
	Supporters
	Opposers
Support	
	Regulatory support
	Incentive support
Outcome (Performance)	
	Degree of success
	Success reasons
	Failure reasons

Effects of application	
	Capacity for adaptive water governance
	Adaptive behaviour of stakeholders
	Stakeholder participation
Transfer of practices	
	Barriers in transfer
	Fitting to local institutional context
	International support and standards
	From what was treated a pilot site to other basins in a country (Demonstrations, Success stories)
	New or existing platforms for local engagement in transboundary water governance
	Types of practices transferred
	Models as boundary objects
	Funding support
	Meeting real needs
	Learning, teaching and capacity-building
	Mutual exchange among parties of tools and experience
Opportunities, Triggers & Drivers	
	Organisational
	Institutional
	Policy and institutional reform
	Informational
	Existing scientific or technical capacity or cooperation
	Political
	Stakeholder involvement
	Financial
	Donor support
	Business opportunities
	Budget incentives
	Available labour
	Social
	Infrastructural
	Available infrastructure
	Environmental
	Environmental problems or commitments
	Climate change
	Rising demand for water OR low availability
	Poor water quality and health problems
	Available water resources
	Flood protection demand arising from flood disasters
Type of best practice or tool	
	Political
	Stakeholder engagement and participatory planning
	Institutional
	IWRM
	Standards and environmental management systems
	Urban and regional land-use planning
	Water-use permits
	Irrigation groups
	Financial
	Micro-credit and other loan schemes
	Organisational

	Watershed or basin management and organisations
	Informational
	Databases, information and decision support systems
	Monitoring or observation networks
	Assessment processes
	Hydrological modelling tools
	Scenarios or visioning tools used
	Environmental Education
	Infrastructural
	Waste water treatment
	Irrigation water management with users
	Secure clean drinking water supplies
	Hydropower development
	Flood safety with retention areas
	Using groundwater for supplemental irrigation
	Social
	Gender-sensitive planning
	Environmental
	Space for water in flood management
Discourses, rationales, policy narratives	
	Hydropower is a form of sustainable economic development and thus a best practice
	Increasing water demand means need technical tools to optimise allocation and rational use
	Environmental education can mitigate harmful side-effects of development
	Conservation and sustainable use can be harmonised
	Flood protection can be based on landscape management rather than river regulation and dikes
	Irrigation is necessary to increase productivity and eliminate poverty

8.4 Overview of Best Practices in Adaptive Water Management

Overview of sources

This overview of existing “best practices in adaptive water management” was compiled from guidance documents, reports and databases from international organisations and various initiatives. The desk-based online research on this topic resulted in the review of the following documents containing relevant information:

- The European Commission and the UN Economic Commission for Europe provide detailed information on existing policies, international commitments, adaptation strategies and measures taken in the water sector;
- The EEA outlines the EU policy framework in its reports and gives examples of best practices on adaptive water management;
- A library of case studies and references, sorted by country, organisation and sector can be found searching the databases provided by Global Water Partnership, UN-Habitat, the UNFCCC and Amica-Climate from the EU Interreg IIIC Initiative;
- A number of initiatives and projects working on the topic of best practices in adaptive water management can be found, most of them on transboundary levels.

The current document will provide a summary review of these major documents and initiatives. To do so, it seems important as an introduction to define what is meant by “best practice in adaptive water management”. The major audience and goals of these “best practice” documents will then be identified, as well as the water issues addressed most frequently. Some of the documents describe steps to incorporate best practices and tools into existing water management policies, which will also be outlined here. Finally, a few more details on what types of measures are included in building adaptive capacity and a

method to classify best practices will be specified. An annex listing details on all the researched documents is included in the current document.

Introduction: defining “best practice” in adaptive water management

The EEA proposes a framework for **assessing adaptation measures** and makes an attempt to outline a rationale for **identifying good practice**⁹. Factors relevant for the success or appropriateness of measures need to be identified. The main criteria include determining the effectiveness of adaptation of a given “good practice”, its side-effects, its efficiency with respect to cost and benefits it generates, the framework conditions needed to implement it. Does a given practice contribute to reducing the impacts of climate change and does it enhance resilience of a system? Which positive or negative side-effects or which spill-over effects can be observed? How do the costs and benefits for various measures balance? What does it involve in terms of technical, social and institutional complexity, what are the alternatives and which stakeholders need to be involved? These questions enable national and international organisations to identify “best practices” on a local, regional and international level in adaptive water management.

In this report a **best practice** is a technique, management method, process, activity, incentive, or reward that is believed to be more effective at delivering particular outcome than any other technique, method, etc. when applied to a particular condition or circumstance. Best practices can also be defined as the most efficient (least amount of effort) or effective (best results) way of accomplishing a task, based on repeatable procedures that have proven themselves over time for large numbers of people.

Major audience and goals of “best practice” documents

The **major audience** of the documents reviewed here are the stakeholders acting in water policy and in the different water sectors, in EU countries and around the world. The European documents specifically aim those with responsibility for river basin management, including flood and drought risk management, for instance in European river basin authorities, but may also prove beneficial for water managers at all levels and outside the EU that are looking for examples of good practice examples, particularly in economies in transition. The guidance documents provide these stakeholders assistance to implement the Water Framework Directive both on national and transboundary levels. The databases enable them to easily search for examples of best practices in water management, in a given sector and a given country or region.

The **issues** addressed most frequently are those where impacts of climate change on water resource management are particularly important. These include on the one hand, flood risk management, sea level rise and coastal erosion, and on the other hand, drought management and scarcity. Also, special attention is also given to the monitoring of water quality and ecological conditions. As explained in the EEA report¹⁰, different **water sectors** require special adaptation measures, for example in spatial planning, agriculture, water services, energy and inland navigation. The European documents focus on these sectors on the river basin scale, as the documents provided aim to support the efforts of the European Commission and Member States to incorporate climate change into their river basin management planning.

Steps to incorporate best practices and tools into existing water management policies

Steps to **incorporate best practices and tools** into existing water management policies can be identified and give an idea of what types of best practices exist in the sector of adaptive water management. The EU and UNECE guidance documents identify similar procedures. In practical terms, the themes covered by the documents are how to build adaptive capacity, what kind of measures can be introduced to promote stakeholder involvement, awareness-raising and participation, and what kind of economic, legal and institutional instruments exist in adaptive water management. Both guidance documents agree on the following steps to incorporate best practices and tools into existing water management policies, which are explained below:

- 1) Defining needs using output of scientific and economic approaches
- 2) Develop adaptation strategies: build adaptive capacity for managing climate risks
- 3) Evaluate the measures implemented

First, needs must be defined by handling scientific knowledge and uncertainties about climate change, and assessing pressures and impacts on water bodies¹¹. The projections and scenarios which can be obtained from global climate models enable stakeholders to evaluate potential impacts and to define the sectors where new practices need to be developed or already existing ones need to adapt. By comparing the results of this analysis with already existing examples of measures and strategies, the right mix of instruments and the time scale of adaptation can be planned. Also, an economic analysis of water use should be conducted, taking into account potential additional pressures, impacts and constraints, to identify the

⁹ EEA 2009: pp. 19-24.

¹⁰ EEA 2009: pp. 77-90.

¹¹ EC 2009: pp. 21-32; UNECE 2009: pp. 57-65.

most cost-effective combinations of measures under a plausible range of climate change and water supply-demand scenarios¹².

In a second step, adaptation strategies will be developed based on these results, meaning building adaptive capacity for managing climate risks¹³. This includes increasing knowledge of potential climate risks for individual river basins, strengthening data collection and knowledge exchange amongst key stakeholders, cross-sectoral integration and partnership working, awareness raising education and training. Ways of building adaptive capacity will be outlined later on.

Finally, the measures implemented need to be evaluated and “climate-checked” in order to determine whether they lead to a reduction of vulnerability in the respective water sectors where they have been carried out, as best practices and tools are always defined relatively to a specific region, climate and context¹⁴. A sensitivity analysis of the proposed measure should be carried out to evaluate long-term effectiveness and cost-efficiency under changing conditions.

Building adaptive capacity

According to the guidance documents and reports reviewed, implementing best practices in adaptive water management emphasises **building adaptive capacity**. This starts by conducting a review of existing knowledge, for instance through national and regional climate risk assessments and information inventories¹⁵. This procedure may highlight information gaps that can be filled by extending data collection and monitoring programmes. Also, scenarios can be helpful in assessing the possible effects of different pressures and in developing water management measures, as climate change is not the only pressure on water resources. Other pressures include population growth, migration, globalisation, changing consumption patterns, and agricultural and industrial developments.

Effective adaptation to climate change therefore requires a cross-sectoral approach and the collection of appropriate data to improve decision making, which enables organisations to develop a sound adaptation strategy. The next step should be identifying stakeholders and deciding on an approach to engagement, mainly working in partnerships¹⁶. Meaningful and early stakeholder engagement can improve the chance of acceptance of measures and hence the delivery of an integrated, cross-sectoral adaptation strategy. Integration here means taking into account all sectors and all levels of management, in order to avoid cross-sectoral conflicts and to ensure that the water supply and sewerage services continue to function under changing conditions. Identification of the stakeholders in the different water sectors will result in the definition of an engagement strategy, with clear roles and responsibilities for each level of management and authority.

All water-related sectors should be well-informed about the possible impacts of climate change. Further training and development in climate change science, forums to enable transfer of knowledge, measures to increase public participation are important steps to broaden the audience and increase its capacities¹⁷. Awareness-raising, not only among water professionals, but on society level, will facilitate the acceptance of adaptation measures.

The building of adaptive capacity and identifying best practices is particularly complex in transboundary basins¹⁸. According to the guidance documents, joint bodies such as international river basin commissions should oversee the development of coordinated adaptation strategies and put in place mechanisms for implementing and monitoring measures, within transboundary agreements and existing legislation and frameworks.

Classifying best practices in adaptive water management

It is also possible to say a word about the method of **classifying best practices** in adaptive water management. The EEA report uses the *main climate change impact* addressed by the measure (e.g. water scarcity and drought, flooding) as the basis for classifying adaptation measures¹⁹. Different impact issues are considered and their relationship with measures in the river basin management practices is explored. Adaptation measures identified as “best practices” are therefore classified by the specific climate change impact they address. The list of climate change impacts include flooding, sea level rise and coastal erosion, water scarcity and droughts, water quality and ecological conditions. A similar approach is used in the Amica-Climate “Matrix of Adaptation Measures”²⁰. The matrix is a tool to explore the various possibilities of adapting to climate variability and climate change on the local to provincial level. It is filled with more than 40 adaptation measures which are assigned to four impact types (columns) and nine categories of measure (rows). Each measure is directly linked to a webpage containing its detailed description, a large number of them being “evaluated practice” which can be considered as “best practice”. The UNFCC and UN-Habitat databases on best practices also contain a lot of proven solutions on the topic of water management and adaptation planning and practice areas around the world.

¹² UNECE 2009: pp. 67-75.

¹³ EC 2009: pp. 33-38.

¹⁴ UNECE 2009: pp. 105-109; EEA 2009: pp. 14-16.

¹⁵ EC 2009: pp. 33-34.

¹⁶ EC 2009: pp. 35-36.

¹⁷ EC 2009: pp. 37.

¹⁸ EC 2009: p. 38; UNECE 2009: p. 91.

¹⁹ EEA 2009: pp. 25-26.

²⁰ Amica-Climate 2005-2006. Retrieved from http://www.amica-climate.net/online_tool.html

The UNECE guidance document states that “Effective adaptation strategies are a mix of structural and non-structural, regulatory and economic instruments and measures, education and awareness-raising to tackle the short-, medium- and long-term impacts of climate change. [...]Any adaptation strategy should include measures in all the steps of the adaptation chain: prevention, improving resilience, preparation, reaction and recovery.”²¹ Best practices and tools in adaptive water management fulfil these criteria. Among the stakeholders who try to realise these goals and work towards adaptation by implementing adaptive policies, frameworks and practical measures in the water sector, we do not only find international organisations like the ones named before in this overview, but also many initiatives, networks and projects, for instance funded by the EU. All sources quoted in this overview and some of the relevant projects and initiatives are mentioned in the table below.

²¹ UNECE 2009: p. 5.

Table 15. Summary of Sources

Name, Institution	Description	Themes covered	Link	Type of document
Resources from institutions				
WFD Guidance Document N°24 River Basin Management in a changing climate, European Commission, 2009	Assistance to stakeholders to implement the WFD: Detailed information on existing policies on water & climate change (EU and country level); on building adaptive capacity for RBM under climate change; guidance on how to consider adaptation in RBM under the WFD	Guiding aspects on capacity building; stakeholder involvement; awareness-raising; economic aspects	http://ec.europa.eu/environment/water/water-framework/facts_figures/guidance_docs_en.htm	Guidance document
Guidance on Water and Adaptation to Climate Change, Economic Commission for Europe, UN, 2009	Detailed information on international commitments regarding adaptation in water management; on adaptation strategies and measures; evaluation of adaptation strategies	Capacity building; stakeholder involvement; participation; awareness-raising; legal and institutional instruments; economic instruments	http://www.unece.org/env/documents/2009/Wat/mp_wat/ECE_MP.WAT_30_E.pdf	Guidance document
Report on good practice measures for climate change adaptation in river basin management plans, EEA, 2009	Compiles the EU policy framework and examples of measures that are relevant for WFD purposes and that can be considered best-practice for adapting water management to climate change, grouped by impact and by sectors	Stakeholder involvement; participation; awareness-raising; economic instruments	http://water.eionet.europa.eu/ETC_Reports/Good_practice_report_final_ETC.pdf	Report
Climate change and water adaptation issues, EEA, 2007	Climate change and EU water policy, National practices and issues, Discussion and future challenges	Participation; awareness-raising; economics instruments	http://www.eea.europa.eu/publications/technical_report_2007_2	Technical Report
Best Practices Database in improving the living environment, UN-Habitat	Contains proven solutions on the topic of water management in many countries around the world	All topics	http://www.bestpractices.org/	Database

UNFCCC Database of submissions on adaptation planning and practices under the Nairobi work programme	Contains all the submissions made by Parties and relevant organisations under the adaptation planning and practices area of the Nairobi Work Programme	All topics	http://maindb.unfccc.int/public/adaptation_planning/	Database
AMICA-CLIMATE: European Interreg IIIC initiative to make the adaptation process more transparent	Matrix of Adaptation Measures: tool to explore the various possibilities of adapting to climate variability and climate change on the local to provincial level	All topics	http://www.amica-climate.net/online_tool.html	Database
Global Water Partnership ToolBox	Library of case studies and references: implementing better approaches for the management of water or learning more about improving water management on a local, national, regional or global level	Capacity building; stakeholder involvement; participation; awareness-raising; legal and institutional instruments; economic instruments	http://www.gwptoolbox.org/index.php	Database
Resources for Designing a National Water Governance Program	Information on reports, websites, organisations, articles etc on water governance, national water strategies and laws	Legislation and policies	http://waterwiki.net/index.php/Resources_for_Designing_A_National_Water_Governance_Programme#Examples_of_National_Water_Strategies_and_Laws_28with_and_without_UNDP_involvement.29	Article
Primer on Designing A National Water Governance Programme	Information on designing a national water governance programme including the key components of a successful water governance programme and examples of actual Water Governance	Stakeholder involvement; participation; awareness-raising; institutional instruments (RBOs)	http://waterwiki.net/index.php/Primer_on_Designing_A_National_Water_Governance_Programme	Article

Projects, Initiatives, Networks				
ADAM Digital Compendium on Adaptation - learning examples and adaptation catalogue	Learning examples describe the experiences that decision makers and organisations have gained in the adaptation learning processes; Adaptation catalogue was developed to collate information on possible adaptation measures including the extent, feasibility, efficiency, and cost effectiveness of these options.	Capacity building; stakeholder involvement; participation; awareness-raising; legal and institutional instruments; economic instruments	http://adam-digital-compendium.pik-potsdam.de/	Portal for dissemination of results of ADAM project (EU Project)
Summer School 2010: Climate Change in the Baltic – From global problems to local adaptation Leibniz-Institut für Ostsee-Forschung Warnemünde	The summer school on 'Climate Change in the Baltic' provides the opportunity to: learn about the latest scenarios, models and consequences of climate change; broaden your knowledge on the influences of climate change on coastal seas; deepen your understanding of the functioning of regional sea ecosystems; familiarise with recent adaptation approaches in coastal and marine systems; get an overview of administrative, legal and planning frameworks; gain insight in applied research and ecosystem modelling.	Participation; awareness-raising; legal and institutional instruments	http://www.io-warnemuende.de/summer-school-2010-de.html	Scientific initiative
Pegaso Project	The main objective of PEGASO is to build on existing capacities and develop common novel approaches to support integrated policies for the coastal, marine and maritime realms of the Mediterranean and Black Sea Basins in ways that are consistent with and relevant to the implementation of the ICZM Protocol for the Mediterranean. PEGASO Platform: An exercise of Adaptive Management	Capacity building; stakeholder involvement; participation	http://www.pegasoproject.eu/	EU Project

BaltAdapt	<p>BALTADAPT seeks to develop such a BSR-wide climate change adaptation strategy. Complementing this main output, the project seeks to achieve the following results:</p> <ul style="list-style-type: none"> * Improved knowledge base: A knowledge brokerage process between political decision makers and researchers leading to improved institutional capacity. The “Baltic Window” in the EU Clearinghouse shall be the hub for decision makers from the Baltic Sea Region. * Action plan: Providing the operational basis for implementing the BSR-wide Climate Change Adaptation Strategy and influencing policies, programmes and regulations. Together with the action plan, recommendations on funding mechanisms for financing climate change adaptation initiatives shall be given. 	Participation; legal and institutional instruments	http://www.sustainable-projects.eu/index.php5?node_id=Baltadaptbr+;161&lang_id=1	Baltic Sea Region Climate Change Adaptation Strategy
Connecting delta cities	Develop a network of delta cities that are active in the field of climate change related spatial development, water management, and adaptation, in order to exchange knowledge on climate adaptation and share best practices that can support cities in developing their adaptation strategies.	Awareness-raising	http://www.deltacities.com/	Network
CoPraNet	Coastal practitioners network to develop and exchange information on best practice in the coastal zone on the issues of sustainable tourism and coastal erosion and beach management	Participation; awareness-raising	http://www.coastalpractice.net/en/tourismdb/index.htm	Network

Good European Practices for Stakeholder Involvement – Lessons from Real Planning Processes (HarmoniCOP)	Compares and assesses national public participation experiences and their backgrounds	Public participation	http://www.harmonicop.uni-osnabrueck.de/files/download/SynthesisOfCaseStudies.pdf	Synthesis of case studies
NeWater	Identify key elements of current water management regimes and investigates their interdependence; Research was focused on transformation processes of these elements in the transition to adaptive integrated water resources management	Governance in WM, sectoral integration in IWRM, information management, stakeholder participation, finances and risk mitigation strategies in WM	http://www.newater.info/	EU Project

8.5 Inventory of Best Practices and Tools in Water Governance from Case study basins and Twinning Projects

Annex 8.5 “Inventory of Best Practices and Tools in Water Governance from Case Study Basins and Twinning Projects” is attached as a separate file to this report.