Twin2Go

D. 2.2: Minutes of Synthesis Workshop

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Twin2Go   Coordinating twinning partnerships towards more
Adaptive governance in river basins

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Document Information

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1 Introduction – context of the workshop

1.1 Workshop objective

Twin2Go or "**Coordinating Twinning Partnerships towards more Adaptive Governance in River Basins**" is a Coordination and Support Action under the EC's 7th Framework Program for Research and Technological Development FP7. Twin2Go intends to contribute to more Adaptive Water Governance by reviewing, assessing and synthesizing current status & progress in water governance in case study basins from previous and ongoing EC FP6 and FP7 projects, and by consolidating and disseminating context-sensitive conclusions and results. For this purpose, under Twin2Go, a series of participative workshops have been planned. The logical sequence of thematic workshops under the Twin2Go project is shown in the figure below.
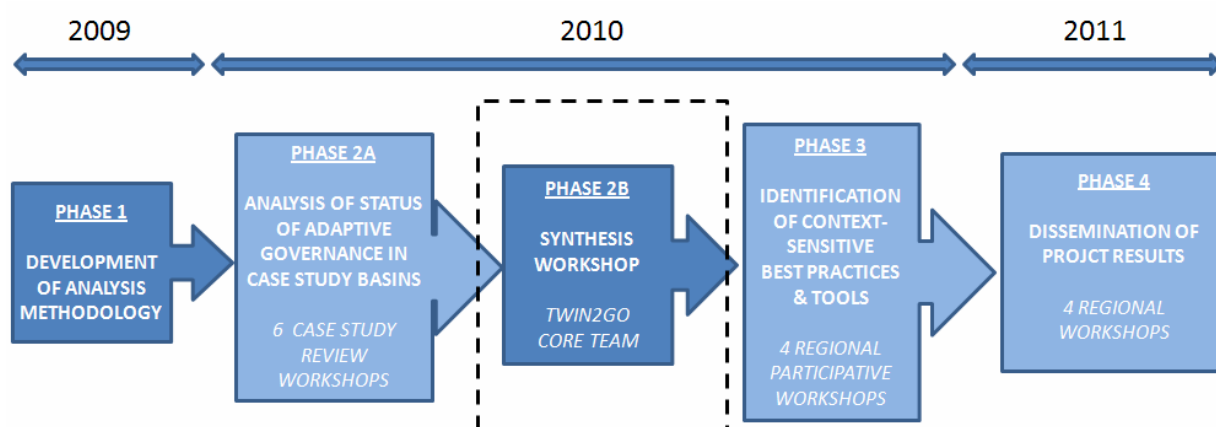
Fig. 1 Twin2Go project flow

For more detailed information on Twin2Go, its objectives and the different phases for project implementation, we kindly invite you to consult the project's webpage at: www.twin2go.eu.

About the Twin2Go Synthesis Workshop

Following the successful execution of the *Twin2Go Case Study Review Workshops*[1], a *Twin2Go Synthesis Workshop* has been organised in Stockholm, Sweden, from 1-2 September 2010[2]. At this workshop, the preliminary results of the basin reviews have been analyzed and discussed in the context of a *cross-basin comparison*. The *synthesis* is a crucial step in the project, as it aims to test hypotheses about the relationships between context and regime characteristics of adaptive water governance systems and their performance, to detect and establish relevant patterns, where feasible, and to identify context-sensitive key factors for enabling or enhancing adaptive water governance.

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[1] The Twin2Go Case Study Review Workshops took place in Europe, Africa, Asia and Latin-America between March and June 2010: Case study basins were analyzed by means of a standardised questionnaire, for their context and governance regime characteristics, as well as for current water governance performance.
[2] The third Twin2Go consortium meeting took place on September 3, one day after the Synthesis Workshop.

The objective of the workshop was formulated as follows: The development of the comparative methodology and synthesis procedure is currently underway. Draft results from applying these methodologies to the set of case study river basins will be brought into the September Synthesis Workshop by the Twin2Go project staff. Participants to the Synthesis Workshop will consist of: Twin2Go Consortium members (project staff), members of the Twin2Go Advisory Board, and external experts from the field of Adaptive Water Governance. At the Workshop, both the draft analysis results as well as the used methodological approach will be discussed by all participants.

Consolidated **results from the discussions** held and analyses conducted during and after the Workshop will feed into the Twin2Go Synthesis Report (deliverable 2.3). Special attention will be given to the policy relevance of the conclusions obtained. The conclusions from this exercise will then be regionally validated in a new series of participative Regional Best-Practice Workshops (Russia/NIS, Africa, Southeast-Asia and Latin-America). After validation and towards the end of the project, a wider dissemination of the project outcome to the international policy maker community is being planned.

2 Day 1: Presentations and discussion on data and synthesis approaches

<u>Moderator: Edi Interwies</u>

<u>Reporters: Tom D'Haeyer</u>

Participants and experts were welcomed by Prof. Claudia Pahl-Wostl, the scientific coordinator of Twin2Go, followed by Dr. Carl Folke, the scientific director of the Stockholm Resilience Centre hosting the workshop who briefly explained the mission and functions of the Centre.

Day one of the Synthesis Workshop consisted primarily out of presentations. Prof. Pahl-Wostl talked about the objectives and overarching framework of Twin2Go, the methodology, which has been developed in the first phase of the project and the resulting questionnaire. Data collection or application of the methodology for assessing regime, context and performance parameters were presented by Jan Cools and Elena Nikitina. An overview has been given on the Case Study Review Workshops and the basins, with a specific example of the workshop which took place in Chiang Mai organised by Twin2Go members EcoPolicy and USER, a workshop jointly organised by Twin2Go and REWIND. The organising Twin2Go members represent the former twinning projects CABRI-Volga and ASEM WaterNet. The presentation concluded with some messages on the post-processing challenges and the resulting data set for 29 cases and 86 indicators.

A second block of presentations dealt with the preliminary synthesis of the available data. Three approaches have been explored respectively by Prof. Claudia Pahl-Wostl, Dr. Louis Lebel and Christian Knieper. The approaches are briefly explained in the following paragraph.

<u>1) Hypotheses + exploratory qualitative analysis:</u>

The first approach for synthesis is to define a set of hypotheses to be tested for plausibility. Each question (indicator) of the questionnaire already includes one hypothesis on which the scoring was developed. One can derive a large number of expected relationships between individual regime characteristics and regime performance measures – each of the questions is based on a hypothesis. However, given the fact that the scores have been derived in a quite pragmatic way it is more robust to analyze in a first hypotheses related to general regime characteristics that are described by several related questions. Here it is useful to develop summarizing indicators for analysis. This implies that the combined scores of several questions relating to the same characteristics/indicator will be used. This allows grouping the different basins in groups and search for patterns. These can be more refined by comparing in a second step the scores for individual relationships. The Twin2Go analytical framework is used to guide the approach for checking hypotheses (*Fig. 2*).
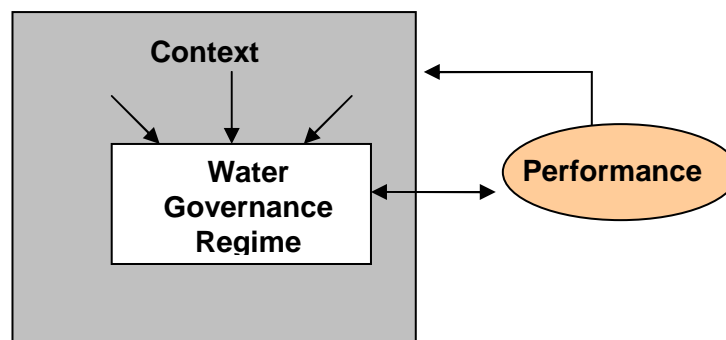
Fig. 2 Twin2Go analytical framework guiding the checking of hypotheses

Hypotheses have the structure of "IF RCi (regime characteristic based on score to question i) is high/low then Pj (performance indicator based on score to question j) is high/low". RC may also refer to an aggregated score over individual questions that refer to one regime characteristic. Furthermore the expected influence of specific context variables (CV) may be specified.

How to derive "aggregated" scores that include the scoring of more than one question? Given the fact that the scores are not quantitative it does not make sense to calculate an average score as mean over the individual scores. Furthermore the relative grading of scores is not always the same – e.g. one may have A-E or A-C in a subset. Hence the information should be preserved and one should derive something like ABAA (scores of four indicators referring to a regime characteristic). To facilitate a first comparison one can then allocate the basins to simplified categories – Low, medium, high – without loosing the information about individual scores which are needed for a more in depth interpretation. How to assign these aggregated scores to the categories low-medium-high (or even more) requires more thought!

2) Statistical analysis of the Twin2Go dataset:

Several statistical methods have been applied on the available data. As a starting point the hypotheses previously presented were turned into statistical problems, trying to explain the performance by the regime while taking into account the context.

Given the limitations of the current data, several assumptions had to be made in preparing for analysis while exploring the statistical approaches. Some of these will be improved and individual analyses will be redone. Most of methods used are fairly 'robust'. This initial analysis provides a guide to what is possible given dataset limitations and characteristics and some initial insights into likely main findings from the comparative and synthesis analysis of scores.

Applying factor analysis: Aim is to help understand how different variables covary. Another use of the factor analysis was interpretation of covarying variables as "dimensions" or "factors" of interest. Ideally this would allow a multi-dimension analysis of relationships between regimes and performance adjusted for context.

Three separate factor analyses were done – one for each group of variables. Factors were then "interpreted" by looking at which variables loaded highly (in parenthesis[3]):

- Performance: Water & sanitation (69,70,71,72,73), Participation (74,75,80) & MDG (68), Deliberated (77,79) & implemented (85,86), Predictable (78), efficient (76), and climate-strategized (81,84)

- Regime: Coordinated (34,35) & integrated (25) & environmental (18), Decentralized (40), just (27,42) & informed (37,38), Basinized (8,10,39) & uncertainty-capable (30,32), Water priced (13,15) & Climate-strategized (33), Legal structure – water rights (3,5,6)

- Context: Economic and institutional development (44, -43,46,47,48), Water availability (58,59,60,61,62,-54), Modified waterscape (64,65,66) and inclusive decision-making (50,53), Transparent (49,51,52) and low climate variability (57)

As a next step to factor analysis above regressed scores on first four performance principal components against regime and context components. The five regime variables were forced into the equation as we were interested in testing hypothesis about them. Context variables were only included if had explanatory power (using stepwise methods). This approach seems to me most promising. Preliminary findings briefly were:

- High water and sanitation performance was not related to water governance regime dimensions but to overall levels of economic and institutional development (context).

- Participation performance was strongly associated with the water governance regime components 2 and 3 that is whether decentralized/just and informed and if basinized and capable of handling uncertainties. None of the context components were significantly associated with performance.

- Deliberated & implemented was weakly associated (P=.06) with regime component 1 that is whether coordinated and integrated. None of the context components helped explain performance on this dimension.

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[3] See deliverable 1.3 (Methods for Comparative Analysis) for the questionnaire and the numbered indicators.

- Predictable, efficient and climate-strategized performance was associated with regime component 1 that is whether coordinated and integrated. Performance was also higher in contexts with high transparency and low climate variability.

Another way to look for patterns in data is to analyze similarities between cases (i.e. basins). One approach is scaling. Used all variables and in this analysis a Euclidean distance to generate similarities.

Another approach was to use logistic regression of composite performance measures against small sets of regime predictor variables (and context if specified in hypothesis). Because of the relatively small data sample, this approach to the analysis can be regarded as somewhat "exploratory".

3) Cross tab interpretation:

The third approach serves to detect relationships between properties of governance regimes and performance under the influence of different contexts. To achieve more robust results and reduce complexity, aggregations were built from the indicators of the Twin2Go questionnaire. Values of the regime and performance aggregations for various case studies were inserted into cross tabs. The pattern how the case study values are distributed in the cross tabs allows identifying relationships between regime properties and performance. In a next step, context aggregates were included in the interpretation to see if they affect the identified patterns.

The results of this screening method can be further analysed or confirmed using statistical methods.

Discussion:

Day one ended with a discussion on the presented methods, approaches and preliminary results allowing for clarifications by the Twin2Go team and exploring options together with the invited exerts to improve the process and expand the data base.

Throughout the discussion following issues surfaced or were clarified:

❖ Data sources and use of external references: Most indicators were scored by local experts and international experts whom have been working in the respective basins or related twinning projects. The number of experts and their affiliation varies from one case to another. For certain indicators, global data sources were suggested as reference. The problem with these global data sources are 1) they hold no basin data but only country based data which somehow complicates the analysis on basin level. And 2) in a few cases data was missing, such as for Bhutan. In order to assess the quality or validity of the data, experts were urged to motivate their choices in the comments section of the questionnaire. In some case these comments are stronger developed than in others.

❖ Ranking of the basins; it was noted that EU basins are leading significantly in the ranking but we need to be cautious with this result. A very dominant factor seems to be economic development, which in the EU is very high compared to the other cases. But on the other hand, environmental performance is not properly reflected thus the scores of the EU basins in relation to the others could look very different after taking into account environmental issues.

❖ So far the basin principle did not turn out to be very significant in explaining performance (preliminary results). It was questioned whether or not the size of the basin could influence this. Is the importance of the basin principle more relevant in large or small basins? Size has been discussed to be included as an extra variable. Also population pressure (density) could maybe be added.

❖ Water and sanitation goals may be a matter of priorities (development goals) and not necessarily be explained in terms of governance regimes. Indeed it may be stronger related to economic and institutional development and to a lesser extend to legal frameworks in place. Water and sanitation does not vary much with legal frameworks which may also be a bit of a problem with aggregation or indicators used, legal indicators do not vary all that well in the analysis. The results so far

also indicate that water and sanitation do not seem to be depending much on context, or regime variables other than economic development. Some explanation in this regard may be that water and sanitation is often not managed by basin authorities, whom regard it as local responsibility.

❖ Some results or basin scores seem somehow unexpected such as the overall good score for the Niger in Mali. This raises questions about the method of scoring and the robustness of the results. One suggestion might be to use weighting, experts can be asked to indicate which questions are more important to them. And it could be seen if weighting would make a difference. It is a way to better feel the participant's interests. The mix of participants in the scoring exercise could influence the results as well. Where more sectors or levels have been participating there has been more controversy. In a few cases experts have been asked to verify and make corrections after the workshops as well. We can question whether we have chosen the right indicators but the quality is fairly good. There is always discussion possible between an A or a B but not really between an A and an E. Small differences should not be over-interpreted.

❖ Is it justified to use several basins in the same country in the statistical analysis such as 3 Ecuadorian and 2 South African basins on a total of 29? Some of the parameters could be positively or negatively over-weighted. However, at this stage the influence does not seem to be strong and will moreover reduce further when more basins can be added (from other countries). And the basins in one and the same country do not necessarily score the same way, which also shows in the ranking. It does need further testing and exploring possible dependencies or trends.

❖ How can basin managers use the presented approaches and results in their own work? In flood prediction for example parameters used are based on long ranges of data but are these still representative in the light of climate change which is progressing very fast? The way calculation methods or exact use of numeric data are beyond the scope of Twin2Go, on the other hand it might help us to rethink how we are dealing with uncertainties and use of existing data, and the changes in the management regime.

Conclusions:

Although the dataset has its limitations, the basin analysis of regime, context and performance and subsequent synthesis methods have proven to be innovative and offer a great deal of potential. The project in its approach is unique; although work has been published with regard to governance indicators and performance, a systematic global and in-depth analysis has never been carried out to this extent.

There is a need to improve the dataset, particularly by adding some environmental performance indicators and possibly by adding more cases to have a larger sample. Possibilities to increase the number of basins before the project end will be taken into consideration; several participants have indicated willingness to give input in this.

Adding Northern American or Australian river basins would particularly enrich the study.

2.1 Presentation: Introduction to Twin2Go

A short introduction was given on Twin2Go, outlining the main workflow in order to indicate the role and importance of the Synthesis Workshop. The synthesis which is an activity under work package 2 follows on the Case Study Review Workshops where case studies have been analysed following a methodology developed in work package 1 of the Twin2Go project. The synthesis results will subsequently feed the next work package on best practices (WP3). Finally in this presentation an overview was given of the participating case study river basins.
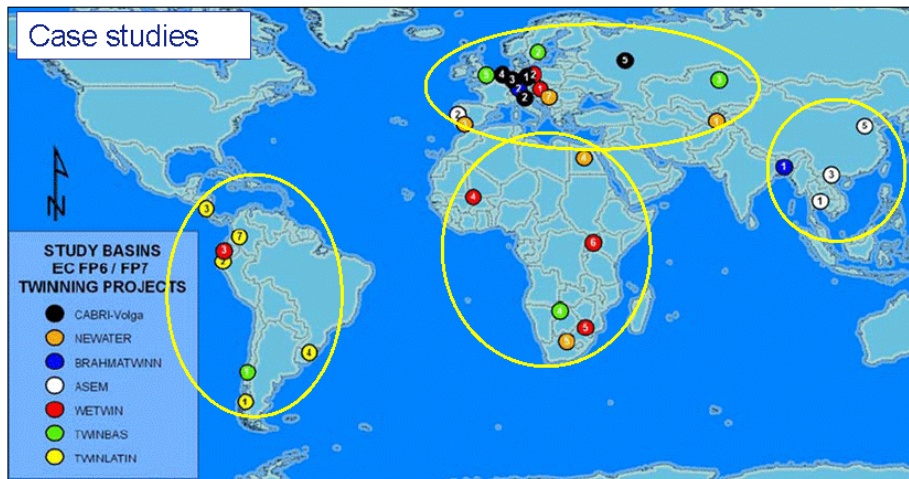
Introduction to
Twin2Go

Claudia Pahl-Wostl
Stockholm 1st September 2010
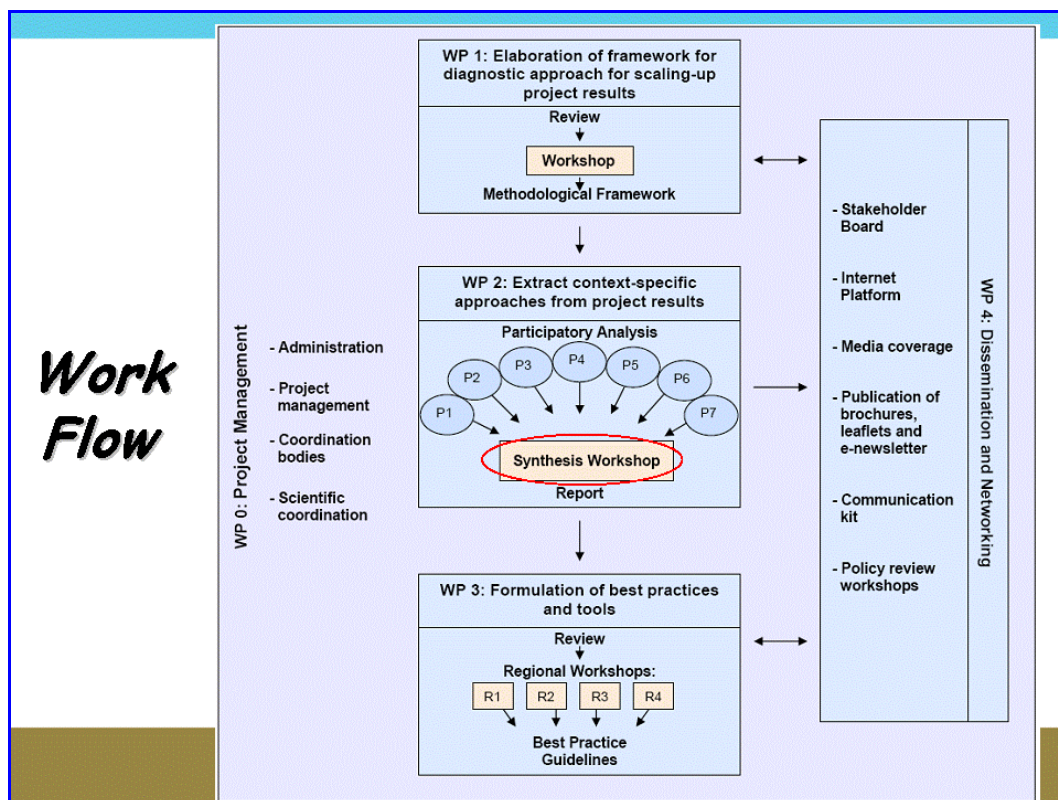
Work
Flow

Projects & Case Studies

- 7 Projects: CABRI-Volga, NeWater, Brahmatwinn, ASEM WaterNet, WETwin, TwinBas, Twinlatin

Case studies

STUDY BASINS
EC FP6 / FP7
TWINNING PROJECTS

- CABRI-Volga
- NEWATER
- BRAHMATWINN
- ASEM
- WETWIN
- TWINBAS
- TWINLATIN

4: Approach

Role of this synthesis workshop

- **Feedback on synthesis methodology and on approach to the development of best practices and policy recommendations**

- **Reflections on dissemination process and future extensions of the data base**

2.2 Presentation: Methodology: questionnaire and conceptual background Hypotheses for testing

The presentation describes the methodological background on which the method for analysing governance regime, context and performance characteristics for river basins has been based. It explains how groups of indicators (for governance regime, context and performance) have been defined and how a set of questions and scoring schemes has been developed to be applied on all case study basins.

The following step was to develop approaches to synthesise the resulting data. The basic idea here is to select a number commonly accepted hypotheses based expert knowledge and literature, and to find relationships between regime, context and performance parameters.

Hypotheses are proposed with regard to:

- Institutional setting
- Regime architecture type
- Integration & coordination
- Knowledge and information management

Analytical Framework:
Context, Regime,
Performance

A diagnostic approach

Characteristics of a problem situation	←→	Characteristics of a solution
	Match!	
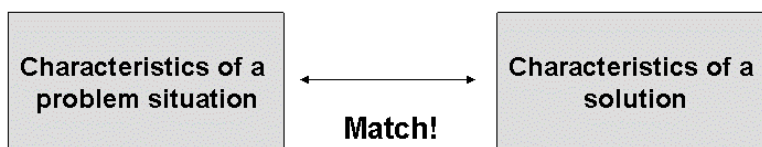
No panaceas but context sensitive solutions
(processes, instruments….) to improve the
performance of water governance and management

Framework of analysis
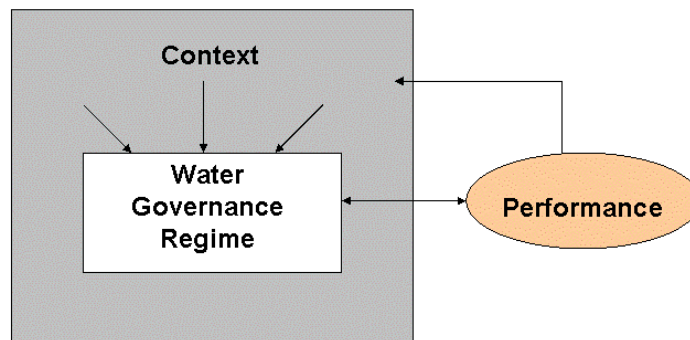
.... analyse how certain characteristics of a water governance regime influence its performance given a certain context in which the regime is embedded

Water governance regime (system)

Water governance regime refers to the range of interdependent political, social, economic and administrative systems that have co-evolved over time and are now in place to regulate development and management of water resources and provisions of water services at different levels of society

Derived from UNDP 2000 water governance definition

Water Governance System

- **Institutional Characteristics**
  - Water Policy, Institutional & legal framework (formal and informal)
  - Formalisation of IWRM principles and MDGs
  - Decision making regarding uncertainties
- **Actor Networks**
  - Cooperation and coordination structures
  - Information sharing
- **Multi-level interactions and cross-sectoral integration**

Context

- **Societal dimension**
- **Good governance principles national level – legal base**
- **Environmental dimension**

Performance

P1 Progress towards stated goals (MDGs)

P2 Good governance principles (realized) as indicators for process dimension

P3 Stakeholder participation (realized)

P4 Response to Climate Change

To be added:

P5 (Change in) State of the aquatic environment

Questionnaire

a) Water policy, Institutional & legal framework (formal and informal)

No.	Indicator	Definition	Hypothesis/ statement on relationship	Scoring scheme	How to assign scores (i.e. on which basis are scores allocated)	Comment on data source
1.	Domestic[1] water legislation (laws, by-laws, etc.) in place?	Formal legal and regulatory framework within a country that explicitly deals with the water sector, at least for one administrative level (national, provincial, local)	Presence of a legal and regulatory framework improves the performance of a regime with regard to good governance principles "accountability, transparency, responsiveness, effectiveness & efficiency, following the rules of law".	- A - B - C - D - E	(A) Domestic water legislation in place that has been implemented for at least 10 years (B) Domestic water legislation in place that has been implemented for less than 10 years (C) Domestic water legislation exists, but has not been implemented (D) Domestic water legislation is under formation (E) No domestic water legislation	http://waterlex.fao.org/waterlex/srv/en/home FAO/WHO Water Law and Standards Database: existence of water laws in general, including the year on in-force-coming, differentiated in water legislation, administration, water management and pollution control with further sub-categories, no information regarding the implementation status, however under Water Management one can see whether there are at least formal "Monitoring and enforcement provisions" http://www.ecolex.org/start.php database, free text search, ECOLEX is operated jointly by FAO, IUCN and UNEP http://www.oas.org/dsd/EnvironmentLaw/WaterLaw/home.htm database of Water Law and regulations in Latin America and the Caribbean

[1] Domestic (instead of national part(s)): within a state

Comparative analyses across cases

- test plausibility of hypotheses
- search for patterns regarding the relationships between – context variables – regime characteristics – performance indicators

Hypotheses aggregating across several scores

➢ Institutional Settings

➢ Regime architecture – type

➢ Integration and Coordination

➢ Information and Knowledge Management

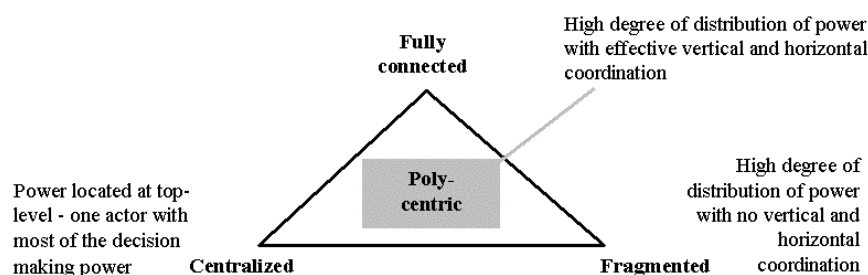Hypotheses link characteristics of water governance systems to performance – they do not yet take context into account Of interest to see if differences can be explained with context

Hypotheses
Institutional Setting

➢ The presence of legal frameworks regulating water management is increasing performance regarding good governance principles and the achievement of sustainability goals (1-4,7 - P1,P2,P5)

➢ Legal frameworks prescribing the basin principle increase performance regarding the achievement of sustainability goals and increase adaptive capacity (8,9,10,11 - P1,P4,P5)

➢ Dominance of either formal or informal institutions is reducing effectiveness and adaptive capacity of water management (22, 23 - P2, P4)

➢ The use of a range of economic and financial instruments increases effectiveness (13-21 – P1,P3,P4,P5)

Regime Architecture - Type

➢ Polycentricity and multi-level arrangements and a balance between bottom-up <-> top-down processes and between decentralization and coordination increase effectiveness and adaptive capacity of a regimes. Centralized top-down regimes lead to compliance problems, impede advanced learning processes and reduce adaptive capacity. Decentralization without coordination leads to fragmented regimes.

Fully connected

High degree of distribution of power with effective vertical and horizontal coordination

Poly-centric

Power located at top-level - one actor with most of the decision making power

Centralized

High degree of distribution of power with no vertical and horizontal coordination

Fragmented

Integration and Coordination

➤ *Lack of vertical integration leads to policy failures due to disconnection of levels and gap between policy process and operational implementation. High vertical integration and cooperation increases adaptive capacity and performance (6,34, 36 – P1,P2,P3,P4,P5)*

➤ *Lack of horizontal integration leads to policy failures due to disconnection of sectors or regions and gap between demand/need for integration in water policies and operational implementation. High vertical integration and effective cooperation increase adaptive capacity and performance (5,35 – P1,P2,P3,P4,P5)*

➤ *The adoption of the IWRM principles increases adaptive capacity and stakeholder involvement (24-26 – P3,P4).*

Knowledge and Information Management

➤ *Open access to information and integration of different kinds of knowledge support higher levels of learning and increases adaptive capacity (37,38 – P2,P3,P4)*

➤ *Adaptive capacity increases if different kinds of uncertainties are taken into account and addressed in an appropriate way (29-33 – P4)*

2.3 Presentation: Overview of Case Study Review Workshops and basins / data summary table

The presentation explains how the methodology developed in WP1 has been applied in a series of basin review workshops. Some comments were made with regard to the filled questionnaires and the need to homogenise scores, fill gaps and assess quality of the data in order to deliver a final data set to be used in the synthesis (a process which has not yet been finalised).

Applying Questionnaire

Table of Contents

Six Case Study Review Workshops

4: Approach

Applying Questionnaire

Result:

- ❖ ~ 100 experts !!!
- ❖ 25 basins reports
- ❖ 28 filled questionnaires
  (Transboundary)

- ❖ Table with scores
  - ❖ 28 cases
  - ❖ 86 indicators / questions

Example: raw values

A–	B–	A	D (D)
B	C+	B	C (D)
A	B–	A	A (B–)
B	B	B(–)	C
B	B	B	A (B–)
A	B	B	B

B	A (B–)
A	B
28,9%; 25,80%	39,70%
B	B

A	C	B
	0–5 mm/a; 100	
A	mm/a	B

- ❖ Experts nuances > using '+' / '-'
- ❖ Current situation vs. (under new law)
- ❖ National numbers scored different in different case studies
- ❖ Multiple scores for 1 indicator (e.g. upstream and downstream, climate, …)

C	A–	B (C)	B–	C	C+
Csb	Aw-Cwb-BSh-Bwh	Aw-Cwb-BSh-Bwh	AF	Cfa	Aw, A SA/SH
SH	A/SA	A/SA	H	SH	H

Adaptive Water Governance:
Lessons from River Basin Workshops

Elena Nikitina, EcoPolicy
Louis Lebel, SEA-USER

Stockholm, 1 Sept. 2010

EC Twinning projects

project name	financed under	status	project webpage	geographic focus on
ASEM WaterNet	FP6	finished	http://www.asemwaternet.org/	Europe, Asia
BRAHMATWINN	FP6	finished	http://www.brahmatwinn.uni-jena.de/	Europe, Asia
CABRI-Volga	FP6	finished	http://www.cabri-volga.org/	Europe, Russia
NeWater	FP6	finished	http://www.newater.info/	Europe, Africa, Asia
Twinbas	FP6	finished	http://ivl.dataphone.se/twinbas/	Europe, NIS, Africa, Latin-America
Twinlatin	FP6	finished	http://www.twinlatin.org/	Europe, Latin-America
WETwin	FP7	ongoing	http://www.wetwin.net/	Europe, Africa, South-America
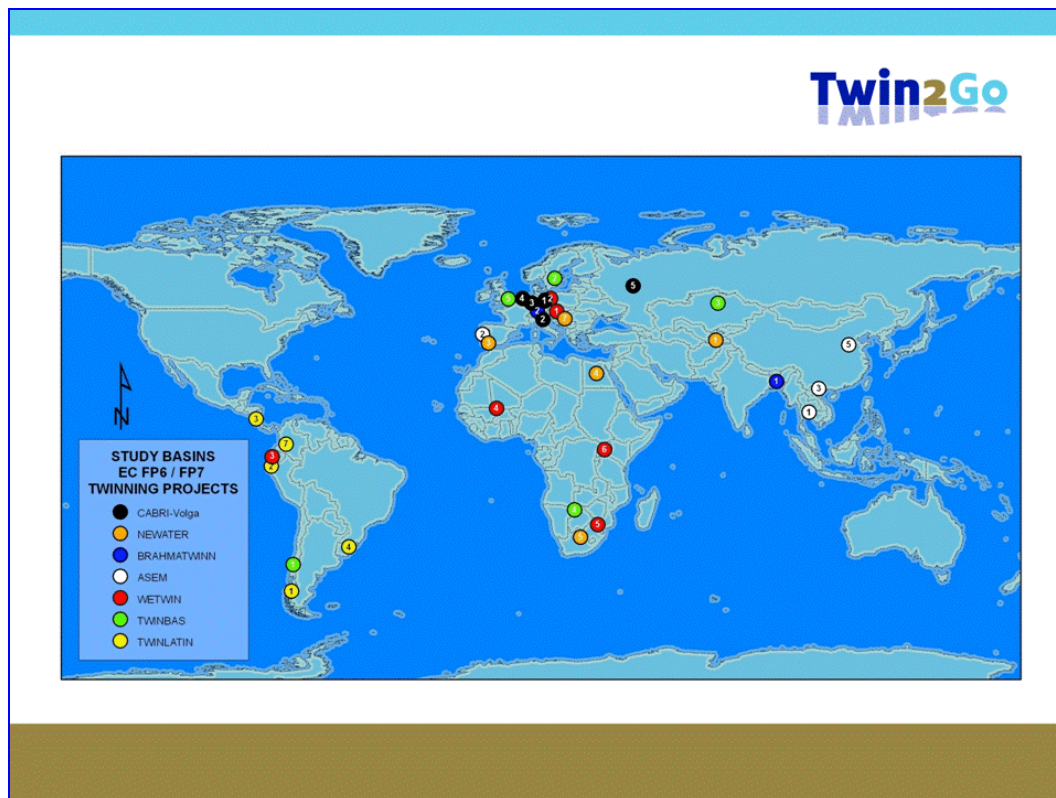
Three basin working groups

- **ASEMWaterNet Project**
    - **Red River**
    - **Bang Pakong**

- **CABRI-Volga Project**
    - **Volga River**

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Three basin working groups

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AGENDA

Adaptive water governance and stakeholder participation in river basin management in Asia and in Europe

INTERNATIONAL WORKSHOP and POLICY ROUNDTABLE

Chiang Mai, Thailand
Business Center, Amari Rincome Hotel
25-28 March 2010

Policy Round Table:

Adaptive water governance practices

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Tasks/Training

- **To fill in the questionnaire**
  - Scores
  - Comments
  - New indicators (if needed)
- **Suggested steps**
  - Check the guide for advice on indicator and levels
  - Discuss these one at a time or closely related ones as a set (translate if needed)
  - Think about evidence carefully – don't rush
  - Summarize findings directly in the word file as Scores and Comments (take as much space as you need)

We want Comments!

The questionnaire

No.	Indicator	Score	Comments
I) Characteristics of environmental governance regimes			
a) Water policy, institutional & legal framework (formal and informal)			
1.	Domestic water legislation (laws, by-laws, etc.) in place?		
2.	Domestic Water Law: Public character of water and legal status of water use rights		
3.	Domestic Water Law: Explicit recognition of traditional and indigenous water uses		
4.	Domestic Water Law: On flow availability, third party rights and ecological requirements		
5.	Integration of domestic water legislation		
6.	Multilevel structure of domestic water legislation and subsidiarity		
7.	Existence of formal domestic administrative structure for water governance		
8.	National basin organisation or comparable arrangement		
	Formalised transboundary		

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Lessons Learned:

- **Combination of several projects →**
  broader overview, exchange of experience, comparison
- **Multiple stakeholder approach effective →**
  RBO, government officials, business, NGOs
- **Ice-breaker policy round table →**
  good experience, insights from each other
- **Size of expert groups for each river basin →**
  optimal – 6-7 experts
- **Good combination of domestic and international experts**
- **'Inclusiveness' and 'joint network' approach →**
  experts are ready to contribute to further analysis
- **Key messages from river basins →**
  useful at the final plenary. Comparisons: common/different.
- **Experts want to have clear answers *how* the results of inventory would be further used and analysed!**

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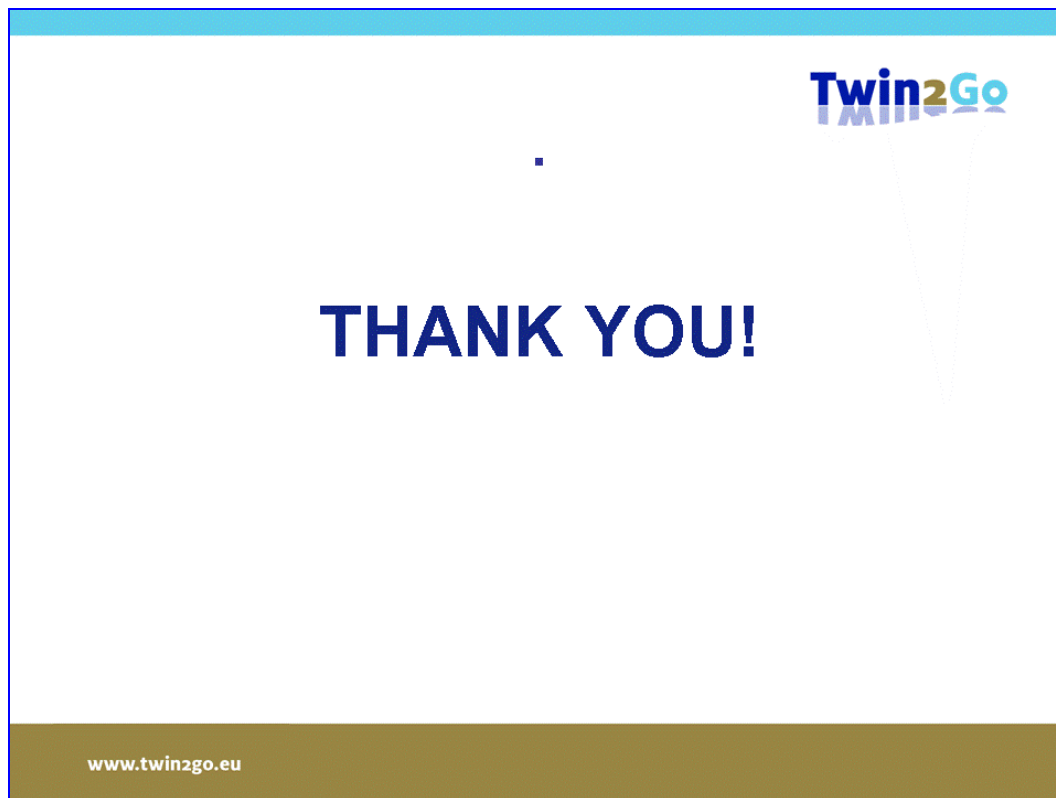
2.4 Presentation: Analysis 1: Hypotheses - exploratory qualitative analysis

Three different approaches have been tested to synthesise the data. The first is an exploratory qualitative analysis looking in to the proposed hypotheses and using aggregated performance indicators.
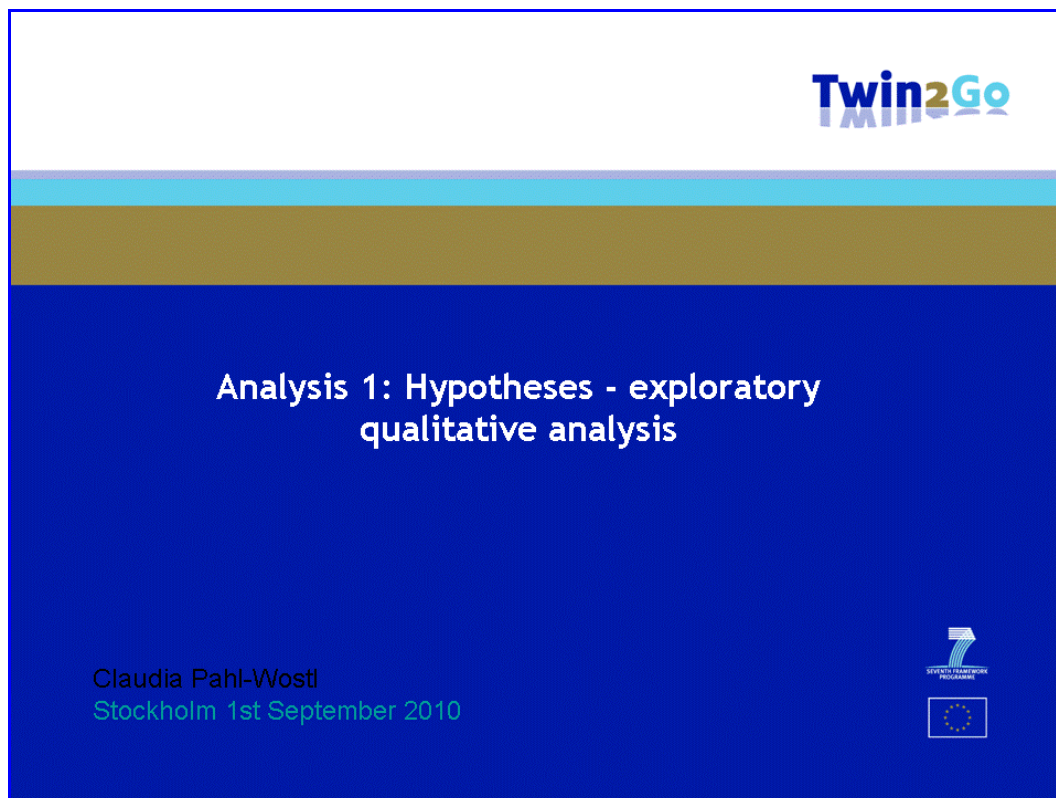
Exploratory approach to assess plausibility of hypotheses

- Check which basins clearly support the hypothesis
- Check which basins clearly contradict the hypothesis -> role of context?

- Hypothesis weak if more than half of the basins cannot be classified in any category

Illustration of the approach for selected hypotheses
First preliminary conclusions

Develop aggregated performance indicators

Assign numerical values to scores in the following categories
- *A,B,C,D,E: A = 4, B = 3, C = 2, D = 1, E = 0*
- *A,B,C: A = 4, B = 2, C = 0*

P1 – Progress towards stated goals (Q 68-73)

P2 – Good governance principles   (Q 75-77)

P3 - Stakeholder participations (Q 74,79,80)

P4 – Response to Climate Change   (Q 81-86)

Hypothesis
Legal Frameworks

Twin2Go

➢ The presence of legal frameworks regulating water management is increasing performance regarding good governance principles and the achievement of sustainability goals (1-4 -> P1,P2)

Influence legal frameworks on performance taking into account context – selected basins

Twin2Go

Basin	As in Scores	P1 (max 24)	P2 (max 12)	
Guadiana (Spain)	AAAA	22	12	High legal frameworks High performance
Tisza (Hungary)	AAAA	24	10	
Rhine (Netherlands)	AAA	24	12	
Cuareim (Uruguay)	AAA	24	10	
Amudarya (Usbekistan)	A (Q1)	14	0	Low legal frameworks Low performance
Brahmaputra (Nepal)	A (Q1)	5	6	
Brahmaputra (India)	No A	9	4	
Volga (Russia)	AAA	9	6	High legal frameworks Low performance
Kyoga (Uganda)	AAA	8	6	

No basin with good performance and low scores in legal frameworks

Conclusion on this hypothesis

➢ **Legal frameworks are a necessary but not sufficient condition for good performance**

➢ **Effectiveness of formal institutions crucial**

➢ **Capacity to implement required (e.g. South Africa)**

-> **different priorities for process of change depending on context**

Relationship between formal and informal institutions

	Effective formal institutions	Ineffective formal institutions
Compatible Goals	Complementary	Substitutive
Conflicting Goals	Accomodating	Competing
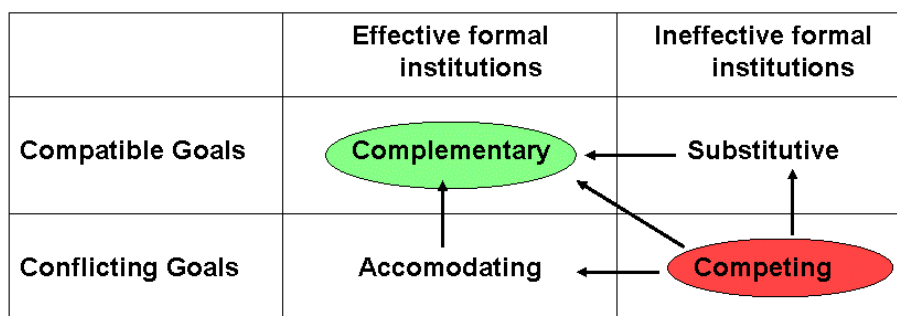
Based on from Helmke and Levitsky, 2003

Hypothesis
Dealing with uncertainty

➢ *Adaptive capacity increases if different kinds of uncertainties are taken into account and addressed in an appropriate way (29-33 – P4)*

Dealing with uncertainty

Basin	Scores	P4 (max 24)
Rhine (Netherlands)	ABABA	24
Guadiana (Spain)	BAAAB	22
Niger (Mali)	AAABA	23
Tisza (Hungary)	ABBBA	18
Elbe (Germany)	BBBAA	17
Amudarya (Uzbekistan)	CCBBB	11
Cauca (Columbia)	BBCBC	11
Biobio (Chile)	BCBCC	6
Brahmaputra (India)	CCCCC	4

Dealing with uncertainty

Basin	Scores	P4-max 24
Rhine (Netherlands)	ABABA	24
Guadiana (Spain)	BAAAB	22
Niger (Mali)	AAABA	23
Tisza (Hungary)	ABBBA	18
Elbe (Germany)	BBBAA	17
Amudarya (Uzbekistan)	CCBBB	11
Cauca (Columbia)	BBCBC	11
Biobio (Chile)	BCBCC	6
Brahmaputra (India)	CCCCC	4

Regime Architecture - Type

Fully connected

Poly-centric

Centralized

Fragmented

Power located at top-level - one actor with most of the decision making power

High degree of distribution of power with effective vertical and horizontal coordination

High degree of distribution of power with no vertical and horizontal coordination
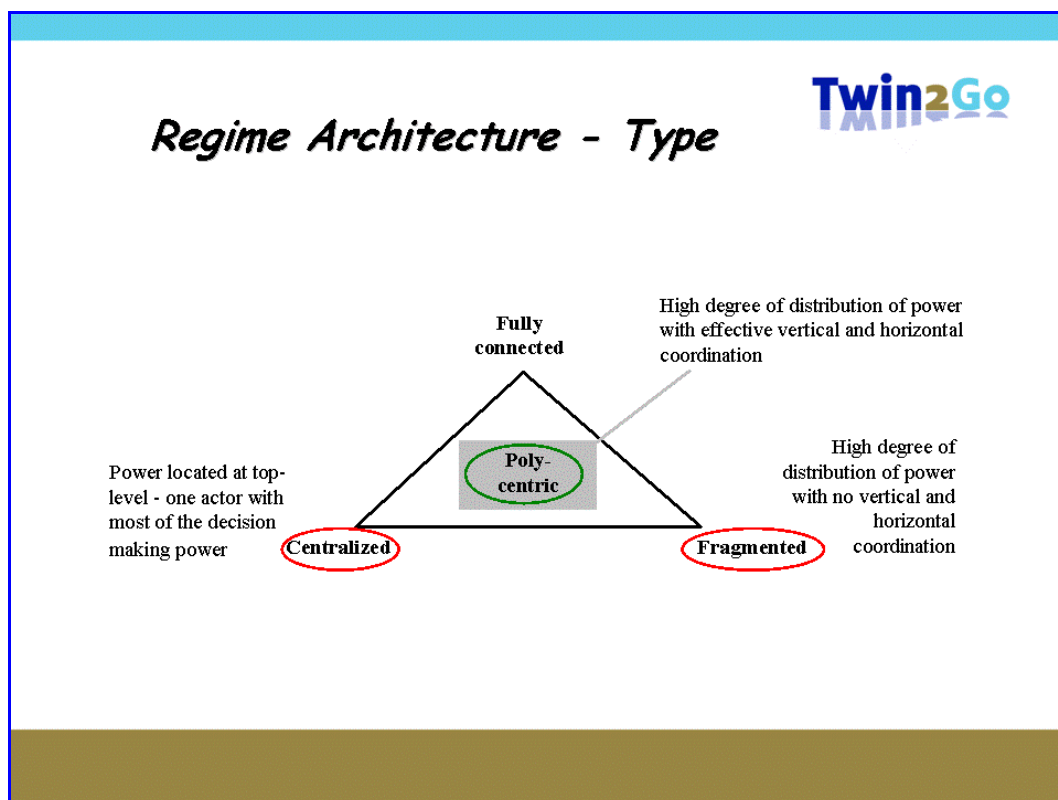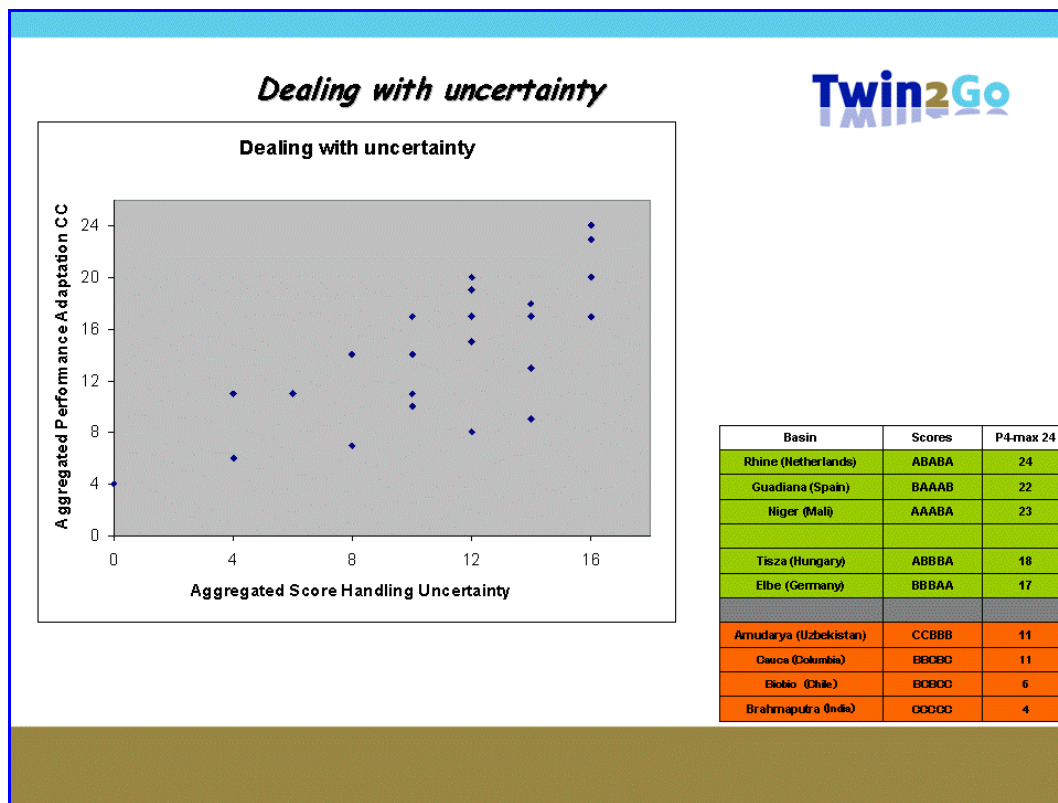
Link Type – Performance
(only basins fulfilling all criteria)

Aggregated Performance
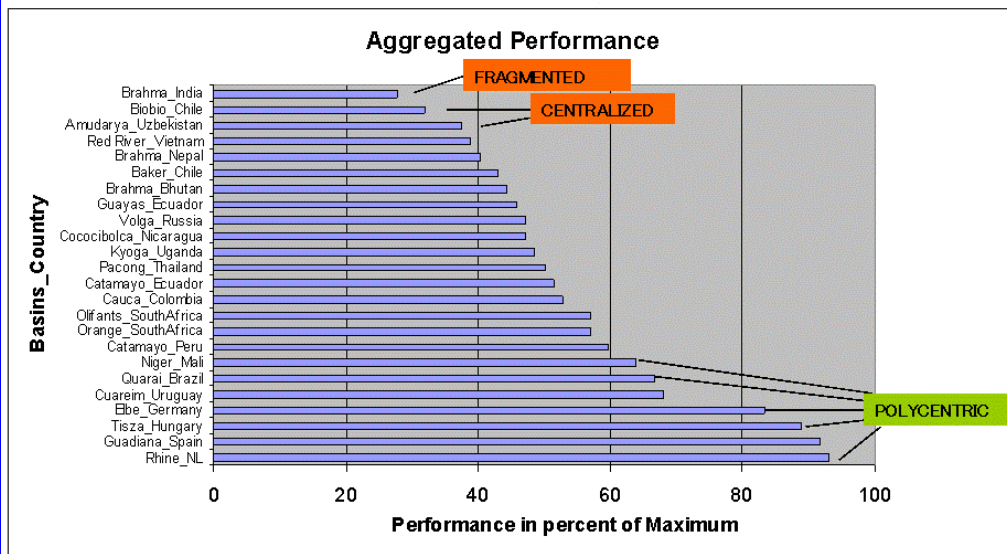
Preliminary conclusions

Crucial factors that determine performance and where major deficiencies exist:

➢ Effective legal frameworks

➢ Polycentric arrangements with balance between top-down and bottom-up processes

➢ Capacity for implementation

➢ Innovative ways to dealing with uncertainty

…………………

➢ Implementation of basin principle less important

➢ Hypotheses are not independent!

………………….

➢ Avoid over-interpretation of rather small differences

2.5 Presentation: Analysis 2: Preliminary statistical analyses of the multi-basin governance dataset.

This is the second approach used for the synthesis. Several statistical methods have been used to explore the data and seek relations between variables. Besides randomly exploring the data, statistics is also used to seek support for the proposed hypotheses.

CAVEATS

- Formal statistical analyses are intended to complement qualitative, in-depth, analyses of basin cases (not as a substitute)
- With relatively small "n" cannot expect to make powerful tests or identify highly nuanced patterns – but at the same time can help sift out the 'real patterns'

Statistical analysis of hypotheses
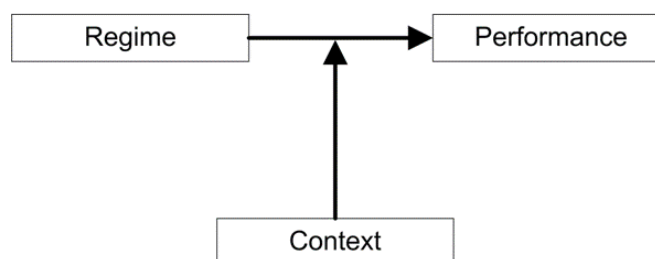
- Try to explain **performance** by **regime** features taking into account **context** when necessary or as appropriate
- Performance is outcome variable of interest, regimes are predictors, and context is treated as a 'confounder'

Decisions about Variables

- Need to choose how 'best' to capture hypothesis in words as a formal expression relating variables:
  - Logical set (AND, OR)
  - Aggregation or scoring (and then group)
  - For predictors might also include each separately (and interaction terms etc…)

Performance measures

- **P1 or Progress towards stated goals**
  =(q68=1)*(q71=1)*((q69=1)|(q69=2))*((q70=1)|(q70=2))*((q72=1)|(q72=2))*((q73=1)|(q73=2))

- **P2 or Good Governance Principles**
  =((q76=1)|(q76=2))*((q75=1)|(q75=2))*((q77=1)|(q77=2))

- **P3 Stakeholder engagement**
  =(Q79=1)*((Q80=1)|(Q80=2))* ((q74=1)|(q74=2))

- **P4 Response to climate change**
  ((q81=1)|(q81=2)|(q81=3))*((82=1)|(q82=2)|(q82=3)|(q82=4))*((q83=1)|(q83=2))*((q84=1)|(q84=2)|(q84=3))*((85=1)|(q85=2)|(q85=3))*((q86=1)|(q86=2))

All analyses make decisions about how to formalize a hypothesize – both outcomes and predictors…there are other options!

H1 Legal frameworks

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)	95.0% C.I.for EXP(B)	
								Lower	Upper
Step 1[a]	Q1(1)	3.511	1.606	4.779	1	.029	33.470	1.438	779.144
	Q2(1)	1.825	1.441	1.605	1	.205	6.204	.369	104.441
	Q3(1)	-2.044	1.583	1.667	1	.197	.130	.006	2.883
	Q4(1)	1.217	1.235	.970	1	.325	3.376	.300	37.998
	Q7(1)	3.736	1.878	3.955	1	.047	41.910	1.056	1663.785
	Constant	-7.011	2.662	6.938	1	.008	.001		

a. Variable(s) entered on step 1: Q1, Q2, Q3, Q4, Q7.

- Basins with good progress towards stated goals are much more likely to have of domestic water legislation in place (Q1) and formal administrative structure (Q7)

Logistic regression is used for binary outcome variables. Predictors are usually categorical (fewer assumptions shape of relations, robust).

Summary of hypothesis tests

- Some support
  - H1 Legal frameworks (**P1**)
  - H2 Basin principles *(P4)*
  - H11 Policy Instruments *(P1)*
  - H5 Centralization **(P2)**
  - H6 Horizontal coordination **(P1,2)**
  - H7 Vertical coordination **(P1,2)**
  - H8 Knowledge access **(P3)**
- No support (H3,4,9,10)

Pattern exploration

- Aim
  - was to help understand how different variables covary
  - Identify factors or a smaller set of composite variables that could be used in further analysis
- Factor analysis: done separately for each of the 3 groups of variables.
- Factors were then "interpreted" by looking at which variables loaded highly

	1	2	3	4
Q24 Formalised IWRM principles	.781			.347
Q3 Domestic Water Law: Explicit recognition of traditional and indigenous water uses	.780			
Q5 Integration of domestic water legislation	.713			
Q28 Integration of wetlands in IWRM and IRBM*	.659	.372		
Q7 Existence of formal domestic administrative structure for water governance	.567	.543		
Q1 Domestic water legislation (laws, by-laws, etc.) in place?	-.554		.458	-.321
Q6 Multilevel structure of domestic water legislation and subsidiarity	.545	.442		
Q36 Role of local governments	.496	.442		.408
Q4 Domestic Water Law: On flow availability, third party rights and ecological requirements	.466			
Q11 Water (basin) strategies, programmes and plans		.772		
Q26 Capacity to implement IWRM		.746		
Q25 State of implementation of IWRM principles		.741		
Q18 Environmental subsidies (related to water)		.682	.537	
Q17 Polluter pays principle (related to water)		.585	.841	
Q35 Horizontal coordination. (governmental)			.847	
Q34 Vertical coordination. (governmental)		.480	.623	.337
Q31 Dealing with uncertainties: Safety margins	.539		.615	

First 4 components from factor analysis of regime variables

R1 –Formalized

R2 – Basinized

R3 – Coordinated

Interpretation of factors

- Performance
  - Water & sanitation goals achieved (69,70,71,72,73)
  - Climate predictable & strategized (78,81,82,83,84,85)
  - Equitable, inclusive (77,80) & effective (76,85)
  - Transparent (75) & participatory (80,74)
- Regime
  - Formalised (24,3,7,1,4,36,28)
  - Basinized IWRM (11,25,26) with instruments (18,17)
  - Coordinated (35,34) and dealing with uncertainties (31,32)
  - Decentralized (40,-23) and knowledgeable (37) with access (27)
- Context
  - Transparent (49,51,48) and inclusive decision-making (50, 53) that is effective (52,47) in a predictable climate (54)
  - Economic and institutional development (44, -43,46,47,48) and climate vulnerability (63)
  - Water availability high (59,60,61,62)
  - Climate (55A,55B,-56)

Regression using factors
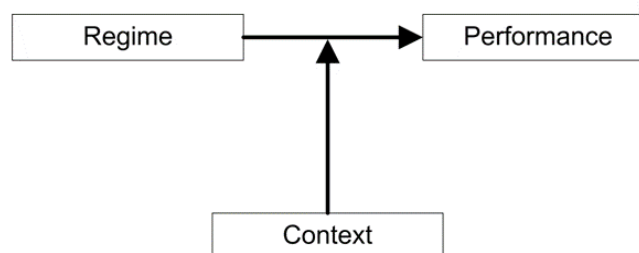
- regressed scores on first 4 performance principal components against regime and context components.
- Four regime variables were forced into the equation as a form of testing hypothesis about them.
- Context variables were then included in a second model to explore confounding and other associations

Slide 1

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	9.516E-17	.130		.000	1.000
	FAC1_3 REGR factor score 1 for analysis 3 Regime	.173	.133	.173	1.308	.203
	FAC2_3 REGR factor score 2 for analysis 3 Regime	.568	.133	.568	4.288	.000
	FAC3_3 REGR factor score 3 for analysis 3 Regime	.103	.133	.103	.780	.443
	FAC4_3 REGR factor score 4 for analysis 3 Regime	.464	.133	.464	3.499	.002
2	(Constant)	1.041E-16	.123		.000	1.000
	FAC1_3 REGR factor score 1 for analysis 3 Regime	.224	.164	.224	1.371	.186
	FAC2_3 REGR factor score 2 for analysis 3 Regime	.592	.143	.592	4.151	.000
	FAC3_3 REGR factor score 3 for analysis 3 Regime	.253	.213	.253	1.188	.249
	FAC4_3 REGR factor score 4 for analysis 3 Regime	.720	.186	.720	3.882	.001
	FAC1_4 REGR factor score 1 for analysis 4 Context	-.212	.195	-.212	-1.089	.289
	FAC2_4 REGR factor score 2 for analysis 4 Context	.112	.172	.112	.650	.523
	FAC3_4 REGR factor score 3 for analysis 4 Context	-.367	.173	-.367	-2.115	.047
	FAC4_4 REGR factor score 4 for analysis 4 Context	-.080	.171	-.080	-.468	.645

a. Dependent Variable: FAC3_2 REGR factor score 3 for analysis 2 Performance

Top model with regime factors only

R2

R4

C3

Slide 2

Associations with Performance 1

- High water and sanitation performance (P1) was not related to water governance regime dimensions but to overall levels of economic and institutional development (C1) and non-tropical climate (C4).

- Predictable, efficient and climate-strategized performance (P2) was associated with coordinated (R3) and formalized (R1) regimes. Context was not important.

Associations with Performance 2

- Equitable, inclusive and effective performance (P3) was associated with basinized (R2) and decentralized (R4) regimes with high water availability (C3).

- Participatory and transparent performance (P4) was moderately associated with decentralized and knowledgeable regimes after adjusting for confounding by context variables.

Similarities by scaling

- All variables…
- Note in this type of analysis it is the distance between points which has "interpretation" value – closer together means more similar or more matches in values
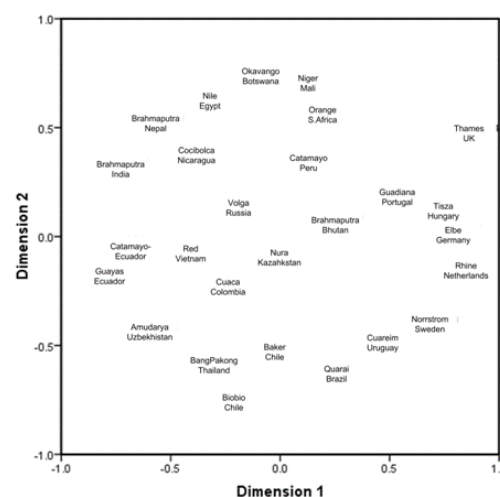
Not updated…

2.6 Presentation: Analysis 3: Cross Tab Interpretation.

The third and last method is a cross tab interpretation of the data. The aim once again is to detect relationships between governance regime properties and performance and seeking to understand the influence of context.
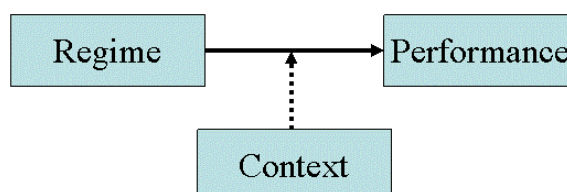
2. Methodology

1. Define aggregations
2. Recode indicators & build aggregations
3. Create cross tabs
4. Interpret cross tabs (without context)
5. Include context in interpretation

2.1 Define Aggregates

- Questionnaire comprises 86 indicators
- Indicators are aggregated
  - Regime aggregations: based on hypotheses
  - Context aggregations: based on factor analysis
  - Performance aggregations: based on factor analysis
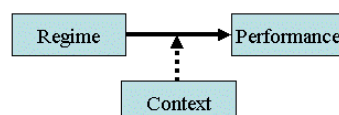
2.1 Define Aggregations: Regime

No.	Regime Aggregation	Indicators
H1	Legal Frameworks	1-4, 7
H2	Basin Principle	8-11
H4	Policentricity & Multi-Level Arrangements	6, 39-42
H5	Centralized Top-Down Regime	39, 40
H6	Vertical Integration & Coordination	6, 34, 36
H7	Horizontal Integration and Coordination	5, 35
H8	Knowledge Management	37, 38
H9	Uncertainties	29-33
H10	IWRM	24-27
H11	Economic and Financial Instruments	13-21

2.1 Define Aggregations: Context & Performance

No.	Context Aggregation	Indicators
C1	Economic & Institutional Development	43, 44, 46-48
C2	Water Availability	(54,) 58-61
C3	Modified Waterscape & Inclusive Decision-Making	50, 53, 64-66
C4	Transparent & Low Climate Variability	49, 51, 52, 57

No.	Performance Aggregation	Indicators
P1	Water & Sanitation	69-73
P2	Participation & Millennium Development Goals	68, 74, 75, 80
P3	Deliberated & Implemented	77, 79, 85, 86
P4	Predictable, Efficient & Climate-Strategized	76, 78, 81, 84

2.2: Recode Indicators & Build Aggregations

- Indicators have different data ranges (e.g. A-C, A-E) => Homogenisation necessary: data range always A-C
  - Example for H7
    - Indicator 5 (A-C): Scores were kept
    - Indicator 35 (A-E): A/B => A, C => B, D/E => C
- Dominant value in indicator group becomes score of the aggregation

2.2: Recode Indicators & Build Aggregates

- Result: Aggregated indicators for the case studies

2.3 Create Cross Tabs

- Build cross tabs (contingency tables)
  - Regime aggregation – Performance aggregation
  - Context aggregation – Performance aggregation
- Include cases
- Example: Regime 1 – Performance 1

Table 1: Cross-table Hypothesis 1 – Performance 1 (Water & sanitation)

	P1: A	P1: B	P1: C
H1: A	05 (BABB) 08 (BAAB) 10 (AAAA) 13 (BC-AA) 21 (BABA) 22 (A-BB) 23 (ABAA) 24 (ABBA)		02 (BCBB) 04 (BABA) 12 (BC-A) 14 (CABB) 15 (CBBA) 18 (B-A-) 26 (BC-B)
H1: B	01 (AACB) 11 (BBBB)	07 (BAAB)	06 (CAAB) 19 (BABB) 20 (C-AB)
H1: C	03 (BCBB) 16 (BBCC) 25 (CACC)	09 (BBCC) 17 (BABB)	

Case 10: Norrström

Case 6: Cocibolca

Not included: -

2.4: Interpret cross tabs (without context)

- Visual interpretation
- If cases accumulate along the diagonal line from AA to CC, this suggests a relationship between both aggregations

	P_y: A	P_y: B	P_y: C
H_x: A	AA	AB	AC
H_x: B	BA	BB	BC
H_x: C	CA	CB	CC

2.4: Interpret cross tabs (without context)

- Example 1: H6 (Vertical integration & coordination) – P2 (participation & MDG)

	P2: A	P2: B	P2: C
H6: A	02 (BCBB) 05 (BABB) 10 (ABAA) 13 (BCAA) 21 (BABA) 22 (A-BB) 23 (ABAA) 24 (ABBA)	15 (CBBA)	20 (C-AB)
H6: B	04 (BABA) 06 (CAAB) 08 (BAAB)	01 (AACB) 07 (BAAB) 11 (BBBB) 12 (BC-A) 14 (CABB) 17 (BABB) 26 (BC-B)	
H6: C			03 (BCBB) 09 (BBCC) 16 (BBCC) 19 (BABB)

Not included: 18, 25

- Relationship recognisable

2.4: Interpret cross tabs (without context)

- Example 2: H1 (legal frameworks) – P1 (water & sanitation)

	P1: A	P1: B	P1: C
H1: A	05 (BABB) 08 (BAAB) 10 (ABAA) 13 (BCAA) 21 (BABA) 22 (A-BB) 23 (ABAA) 24 (ABBA)		02 (BCBB) 04 (BABA) 12 (BC-A) 14 (CABB) 15 (CBBA) 18 (B-A-) 26 (BC-B)
H1: B	01 (AACB) 11 (BBBB)	07 (BAAB)	06 (CAAB) 19 (BABB) 20 (C-AB)
H1: C	03 (BCBB) 16 (BBCC) 25 (CACC)	09 (BBCC) 17 (BABB)	

Not included: -

- No clear relationship recognisable

Slide 1

Twin2Go

2.5 Include context in interpretation

1. Create and interpret cross tabs "context – performance"
2. Examine distribution of context values in cross tabs "regime - performance" (rows):

	Good performance	Medium performance	Bad performance
Given Regime property	*Do context values become worse?* →		

- If context values worsen from left to right, this suggests an influence of context

Slide 2

Twin2Go

2.5 Include context in interpretation

- Example: Cross tab *H1 (legal frameworks) – P1 (water & sanitation)*
  - Influence by C1 (econ. & institutional development)?

- Values worsen from A/B to B/C

3. Preliminary Results: Regime - Performance

	P1: Water & sanitation	P2: Participation & MDG	P3: Deliberated & Implemented	P4: Predictable, Efficient, Climate-Strategized
H1: Legal Frameworks	0	2	0	2
H2: Basin Principle	0	1	1	2
H4: Polycentricity, multi-level-arrangements	0	1	1	2
H5: Centralized top-down regime	0	1	0	2
H6: Vertical integration & coordination	0	2	1	2
H7 Horizontal integration & coordination	0	2	0	2
H8: Knowledge management	0	1	2	2
H9: Uncertainties	0	1	2	2
H10: IWRM	0	0	1	2
H11: Economic & financial instruments	0	1	0	1

0: Visual interpretation suggestst no influence.
1: Visual interpretation suggests medium relationship.
2: Visual interpretation suggests strong relationship.

- No regime aggregation relates to P1
- All regime aggregations relate to P4

3. Preliminary Results: Context - Performance

	P1: Water & sanitation	P2: Participation & MDG	P3: Deliberated & Implemented	P4: Predictable, Efficient, Climate-Strategized
C1: Economic & Institutional Development	2	0	1	1
C2: Water Availability (without Q54)	0	0	0	0
C3: Modified Waterscape & Inclusive Decision-Making	0	2	1	2
C4: Transparent & Low Climate Variability	0	2	1	2

0: Visual interpretation suggestst no influence.
1: Visual interpretation suggests medium relationship.
2: Visual interpretation suggests strong relationship.

- C1 relates to P1
- No relationship between C2 and performance recognisable

3. Preliminary Results: Twin2Go
Regime – Context – Performance

	P1: Water & sanitation	P2: Participation & MDG	P3: Deliberated & Implemented	P4: Predictable, Efficient, Climate-Strategized
H1: Legal Frameworks	0 influence by C1	2	slight influence by C1?	2
H2: Basin Principle	1 influence by C1	slight influence by C3?	1	2 slight influence by C3? slight influence by C4?
H4: Polycentricity, multi-level-arrangements	influen...			2 slight influence by C1? slight influence by C4?
H5: Centralized top-down regime	0 influence by C1	1 slight influence by C1? influence by C3 influence by C4	0	2
H6: Vertical integration & coordination	0 influence by C1	2	1	2 slight influence by C1?
H7 Horizontal integration & coordination	0 influence by C1	2 influenc...	0	2
H8: Knowledge management	0 influence by C1	slight infl... influence by C3 influence by C4		slight influence by C3?
H9: Uncertainties	0 influence by C1	1 slight influence by C3? influence by C4	2 slight influence by C1?	2 slight influence by C1? slight influence by C3? slight influence by C4?
H10: IWRM	0 slight influence by C1?	0 influenc... influenc...	1	2
H11: Economic & financial instruments	0 slight influence by C1?	slight infl... slight infl... slight influence by C4?		

P not related to regime,
P related to context

P related to regime,
P not related to context

P related to regime,
P related to context

- Context influences most regime-performance relationships
- Context clearly related to P1 (water & sanitation)
- Context not dominant

Conclusions & Outlook

- Conclusions
  - Approach allows identifying relationships between regime and performance
    - Statistically significant? Further analysis needed.
  - Identification of context relationships is more difficult
- Outlook
  - Include two missing cases
  - Include post-processed data table
  - Include additional indicators

3   Day 2: Workgroup sessions

Moderator: Edi Interwies

Reporters: Tom D'Haeyer and others

The second day was reserved mainly for additional discussions on the methodology and data in two parallel workgroups. During the second day also a new issue has been introduced; the objectives and planned activities and approach for work package three on best practices was presented and further discussed. The day was concluded with a final discussion and closing remarks by the scientific coordinator, members of the Advisory Board of Twin2Go and the representative of the EC.

3.1   Presentation work package 3: best practices

In order to facilitate the transfer from paper to practice, currently Twin2Go proceeds to identifying lessons learnt and best practices and tools (BP&T) for implementing adaptive water governance from the synthesis results within 29 river basins. Assessment of possibilities and constraints for application of BP&T in the targeted regions, as well as aggregating key messages about existing gaps between policy and practice and means to overcome them is a part of this exercise.

Inquiry about how to better transfer and adapt innovative practices to the national specifics of different countries and river basins' context is made. The main foci of this work-package are on the inquiry about BP&T in: 1) application of national water frameworks in river basins, 2) coordination of engagement with non-state actors, and 3) enabling learning and building adaptive capacity in water management in river basins.

Multiple stakeholders are the driving force behind the transition from the present water resources management practices to more adaptive water governance schemes. Twin2Go develops a dialogue with authorities, stakeholders and end-users in the targeted regions and identifies their interests, needs and capacities in implementing adaptive water governance. For this purpose it organises four Regional Best Practice Workshops to share practical insights and knowledge for transitions towards more adaptive and participatory IWRM. In these workshops Twin2Go's initial results are to be presented and discussed with experts and representatives of various stakeholders from the twinning basins and with broader water management communities in the targeted regions - Africa, Latin America, Southeast Asia, and Russia/New Independent States. Guidelines on BP&T in implementing adaptive water governance in river basins and in learning from each other are among the practical outputs.

Twin2Go WP3:
Best Practices and Tools

Elena Nikitina, EcoPolicy
Stockholm, 3 Sept. 2010

WP3: Formulate Best Practices and Tools for implementation of adaptive water governance and for transfer of research results and experiences across river basins

GOALS:

•Dialogue on possibilities and constraints for BP&T implementation with authorities, stakeholders and end-users

•Enhance exchange of research results on IWRM in decision-making and practice

•Formulate Guidelines on BP&T in adaptive water governance

www.twin2go.eu

WP3 STRUCTURE and TASKS (1):

Task 1: Review BP&T in adaptive and participatory IWRM; possibilities and constraints for their transfer and implementation
Month 12-17 (Oct)

• Questionnaires-inventory for experts

• BP&T Briefs to discuss at 4RW

• Identify major problems/constraints in river basins to discuss at 4RW

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WP3 STRUCTURE and TASKS (2):

Task 1: Organize RW (4): consolidate results and exchange lessons learned from the EU twinning projects with experts in the regions
Month 15-18 (Nov)

• Disseminate BP&T Briefs

• Develop questionnaires-inventory and format for 4RW brainstorming

• Organize 4RW

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WP3 Approaches

- BP&T: package of experiences, lessons learned, sucess and failures
  - -- Twinning projects/basins – 28 Basin Questionaires
  - -- External experts from targeted regions
  - -- WP1 + WP2 results
- BP&T: in water governance; policy oriented
- BP&T: with a focus on: 1) perfomance/implementation
  2) transfer/exchange
- BP&T: context is important

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BP&T: What does it mean? (1)

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

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BP&T: What does it mean? (2)

- *Various SH might have different interests, needs, and capacities...*
- BP&T: Twin2Go categories for aggregated performance in basins –
    - P1: Progress towards stated goals
    - P2: Good governance principles
    - P3: Stakeholder participation
    - P4: Response to climate change
    - P5: Environmental sustainability
- BP&T: We need evidence about *success* and *problems in basins* to illustrate our major hypothesis
- BP&T: *qualitative* illustrations and stories

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Opportunities and constraints for BP&T

- BP&T in river basins: Inventory of Implementation Barriers --> *Context oriented* → *Situational factors:*

(28 Basin Questionnaires + Experts)

External:
- = Economic constraints
- = Financial problems
- = Political problems
- = Social and behavioral barriers

Indogenous to water sector:
- = Administrative capacity
- = Performance problems
- = Limits of enforcement/verification
- = Public involvement/leadership

- BP&T in river basins: Inventory of Implementation Opportunities --> *Context oriented* → *Situational factors:*

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Key Messages about performance:

"Governments/regulators set the framework and rules by which other actors in water sector behave…"

Foci 1: Application of national water frameworks in river basins — *Success stories*

Foci 2: Coordination and forms of engagement with non-state actors — *Barriers and Constraints*

Foci 3: Enabling learning and building adaptive capacity in water management — *Context a drivers*

Policy-practice gaps

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„Going from paper to practice" (1)

Foci 1: Application of national water frameworks in 28 river basins in 4 targeted regions

- *What's done to enact/apply/coordinate laws, institutions, policies in practice*

- *Incentives + Compliance, control, enforcement, verification tools*

- *Package of policy instruments applied to enhance adaptive capacity*

What practices support adaptive water governance, and which hinder?

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„Going from paper to practice" (2)

Foci 2: Coordination and forms of engagement with non-state actors

- Is SH involvement encouraged in laws and in practice?

- Forms of dialogue and joint actions

- Partnerships among SH and networks

- BP&T in awareness raising

What practices support adaptive water governance, and which hinder?

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„Going from paper to practice" (3)

Foci 3: Enabling learning and building adaptive capacity in water management

- Knowledge and info- management

- Adaptive capacities of SH

- Vision of adaptive strategies and measures in river basins

What are the ‚show-cases' of adaptive practices by SH?

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Transfer of BP&T across basins

1. Transfer

2. Barriers for export/import of BP&T

2. Adaptation to local context: *Modified? Similar contexts?*

3. Learning from each other

4. How BP&T can be shared with other basins?

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WP3 Deliverables

• **D3.1 Briefing papers on best practices and tools (Brief)**
Month: 15

• **D3.2 Report from 4 regional workshops (RWR)**
Month: 18

• **D3.3 Best practice Guidelines and tools for knowledge transfer and implementation of adaptive water governance (BP&T Guide)**
Month: 20

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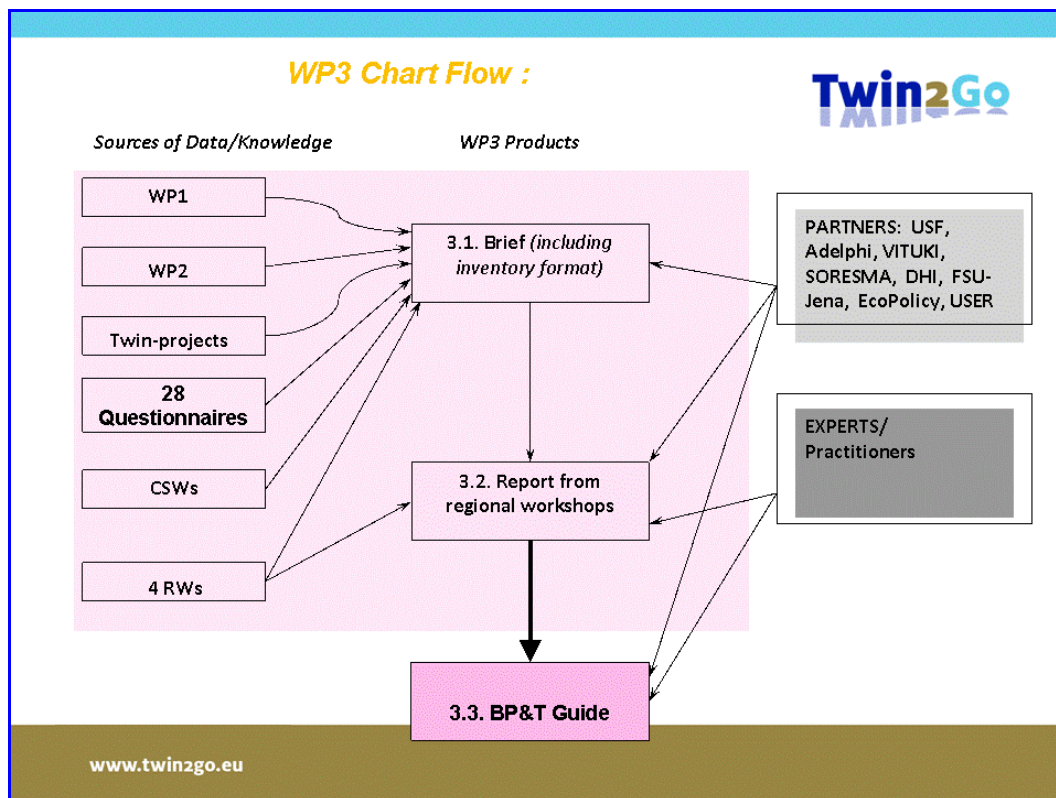
3.2 Minutes working group sessions

Group session 1) Working group on methods (data collection, statistics, and other); chair: Jan Cools
(Jan, Palle, Anil, Craig, Louis, Mats, Irina, Xu, Christian, Claudia, Edi)

The workgroup participants have been asked to reflect on the data collection process and the three approaches presented for analysing the resulting data. Which improvements can be made? Can alternative methods be suggested?

The resulting discussion did not go in depth into alternative methods. Considering the time constraints and limited resources in Twin2Go it was deemed more relevant to improve the existing data and approaches. The three presented methods should continue to be used allowing for comparison and results should be taken back to the case studies to verify if they capture the opinions of the local experts. The group focused on following points;

❖ Adding environmental indicators
❖ How to simplify and prioritise parameters / get key indicators?
❖ What will be the added value of Twin2Go to water managers?

Adding environmental indicators: The Twin2Go team has made suggestions for a number of additional indicators:

❖ Status of aquatic biodiversity (rivers and associated wetlands) – proportion of original native fish species still present in basin
❖ Level of problems with invasive exotic species (fish, plants, mollusks)
❖ Severity of fish –kills (due to low BOD or other forms of pollution)
❖ Is infrastructure managed and water allocated in a way that takes into account maintenance of aquatic ecosystems
❖ Overall trend in aquatic ecosystem health in past decade in the basin

During the discussion additional environmental performance indicators or areas have been proposed:

- ❖ Sustainability of current patterns of groundwater use throughout basin
- ❖ River water quality treatment needs (whether actually used or not)
- ❖ Groundwater quality treatment needs
- ❖ State of the environment (scarcity, groundwater, biodiversity, …)
- ❖ Environmental governance / performance (what is government doing about a pressure)
- ❖ The possibility to add indicators was offered to participants a ASEM WaterNet WS (Mekong river)
- ❖ Local level is not focus of Twin2Go – rather focus on sub-basin
- ❖ It is difficult at this stage of the project to add further indicators

It has furthermore been suggested to add regime parameters related to the requirements or practices for EIAs, and to add parameters on land use or land management practices. Groundwater and response to climate change could be elaborated on and scarcity is missing as a context parameter.

Simplification and prioritization: Weighting of parameters by stakeholders may not be possible within the scope of Twin2Go due to logistic and resource constraints. Single indicators are more easily understood than aggregated indicators; therefore it would be more interesting to work with a selection of key indicators rather than aggregating. To select such key indicators some form of sensitivity analysis would be required. Different methods could be used and compared to come up with results. Indicators should be prioritised in function of the hypothesis to be tested.

Dissemination: In making the Twin2Go results useful for basin managers, the first step is to clearly formulate messages in accessible text and visual materials. Messages need to be packaged correctly in function of the target groups. Professional writers should be involved when it comes to drawing up high quality policy briefs.

Group session 2) Working group on performance measures - comparing basins / ranking basins; chair: Dr. István Zsuffa
(János, Sinh, Christos, Elena, János, Kim, David, Elena, Maja, Sonja, Anita, Tom, István)

As an introduction to the discussion a brief overview of the currently used indicators and groups was provided. At this stage 19 performance measures (in four groups) have been included in the total of 86 indicators. Subsequently the proposed additional performance measures on the aquatic environment were presented. In addition to this the question of grouping, compacting or aggregating indicators came up, leading to some thoughts on the development of an index for evaluating and ranking basins.

Discussion:
- ❖ There are at least two approaches to be considered: 1) measuring how rules are implemented by looking at the state of or changes in the environment. 2) Another might be to see how rules change the behaviour of actors.
- ❖ More data could show about the behaviour of river basins. Most methods presented on the previous day analysed the relation between the groups of indicators, how governance determines performance and how context influences this. But before we do this we should look at the characteristics of the data set we have.

- ❖ Some ranking has already been done to explore possibilities. For this purpose the database was modified by transforming letters to numeric values, while some parameters were dropped. What can be expected from ranking? The ranking could visualise tendencies. We could try to see what the optimal river basin would be, based on the scores of the questionnaire and compare the other basins how they situate in relation to this ideal case?
- ❖ A couple of graphs were presented and discussed (*Fig. 3 Fig. 7*). What is very evident is that the best performing sub-basins in the graphs are the European ones. What can also be read is that most of the rivers do perform nicely (more than 60%). In the second one (*Fig. 4*) it can even be seen more clearly.
- ❖ In the first graph (*Fig. 3*) the context is included. But the context is not comparable; Context is given, such as climatic conditions, it cannot be changed. A possibility would be to make some categories with similar context and do the ranking in these categories. On the other hand it is noted that performance should include adaptability and thus is also related to the (changing) context.

- ❖ So we looked at the relation between the governance and the performance (*Fig. 5*). This gives an almost linear relationship. Now after looking deeper into the graph a different story comes up. The European basins still come up strongest. This is probably the result of the WFD. The Volga is an exception; this could be because the WFD is not implemented there. The ranking of the Volga is likely to be based on economic development. On the other hand the difference is maybe not so much the context but the goals set in the basin.
- ❖ Performance in this discussion is not looking specifically at the WFD implementation. Here performance is as currently included in the 86 indicators in the Twin2Go methodology. Looking at performance should be done against the goals or objectives set in the basins; or how well are basins succeeding in reaching their objectives. These vary from one case to another. In the EU now the ecological performance is the main objective, in other countries they have others. Comparing basins in this way is difficult.
- ❖ For the other basins the linear trend is not so obvious anymore. The performance seems rather similar for all, even though governance changes (improves) from one to another.
- ❖ Now a graph is given giving a ranking number (*Fig. 7*). Again some linear function comes out of it but with some distances between basins.
- ❖ Ranking can be applied with weights; here all indicators were used with the same weight. Some indicators do weight more than others, which should be taken into account. But what methodology should we use to allocate weights to indicators? And who should do it? We experts, or stakeholders?
- ❖ The Volga case was interesting as it shows a mentality difference. Often the Rhine is presented as the best performing river and the Volga as a poorly performing. But in many ways (e.g. heavy metals) the Volga actually scores better. And it is a pity there are no other OECD countries included because then we could see if the WFD is so important or dominant.
- ❖ Some rivers in the US or India are not flowing at all because of management decisions. Rivers are dammed or over-diverted. Is this good or bad performance? From a management perspective, objectives are reached; from an environmental perspective these management goals may be questioned. So far we are looking mostly at performance in terms of needs of the society, not at the needs of the environment. The later ones need to be brought into the analysis to balance the other. There is most certainly a need to integrate both from a sustainability point of view. Needs from the population are to be met but not while compromising the environmental needs.
- ❖ In the context also the size needs to be taken into the account. Or a spatial and temporal aspect. Do you analyse the entire basin, or a tributary? Do we look at recent events or very long term? Can we 'sacrifice' one section in a basin for the benefit of another section (e.g. draining or damming one tributary), or do we allow temporal over-extraction? In this sense it becomes also a value question. Decisions in this regard need to be made outweighing the consequences. Stakeholders need to be informed on consequences by the decision makers. But knowledge changes with values; we see things in a different way by valuing them differently. It is interactive. An example is given as to how large dam projects and resettlement issues are evaluated; if you want to create a reservoir in an indigenous area, the World Bank strategy before was to proceed with the project if the economic benefit is large and communities not big. More recently it became a human right issue rather then an economic issue. This is a value approach. It is not just a matter to balancing needs of nature and society. In 30 years there will maybe be a nature rights approach.

Further discussion the proposed additional parameters:
- ❖ Some exotic species are introduced intentionally for fisheries. If this was the goal, how do you relate it to the performance as good or bad? And which impacts are referred too; economic impact, impact on nature?
- ❖ We need to keep in mind to capture trends not status.
- ❖ If you make the questions scientifically speaking too detailed we can only get them from scientists, not from managers or stakeholders.
- ❖ A paper is coming out in autumn on a global assessment on human water security and biodiversity. In this study 23 indicators are used. It is pixel based (30 minute pixels). János can ask the authors if there is some possibility to have access to the data.
- ❖ It might be interesting in a later stage to take whole basins into account rather than national parts of a basin.

- ❖ Additional basins may still be added: János is collecting additional data on the Tisza in neighbouring countries, Sinh is looking into the Red River (China – Vietnam). David mentions the possibility to get data from the US.
- ❖ An additional and unexpected outcome of an analysis such as performed in Twin2Go is that it can stimulate or feed the dialogue on transboundary issues in a particular basin. Particularly among scientists but even involving policy makers.
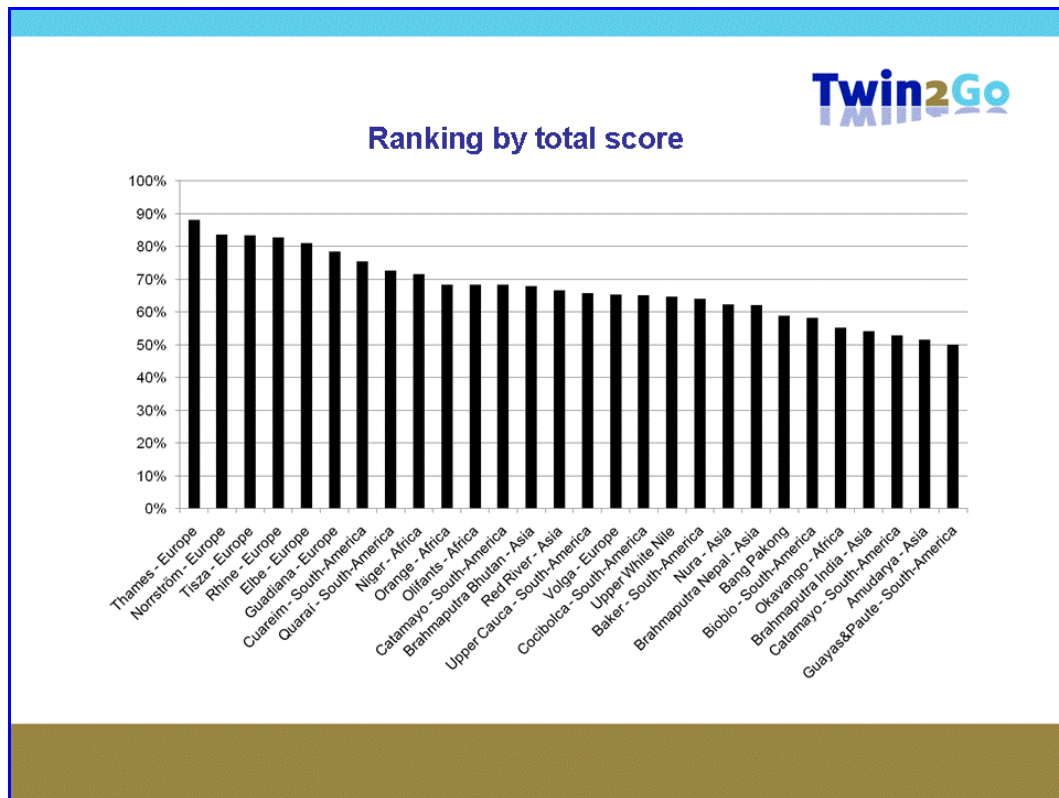
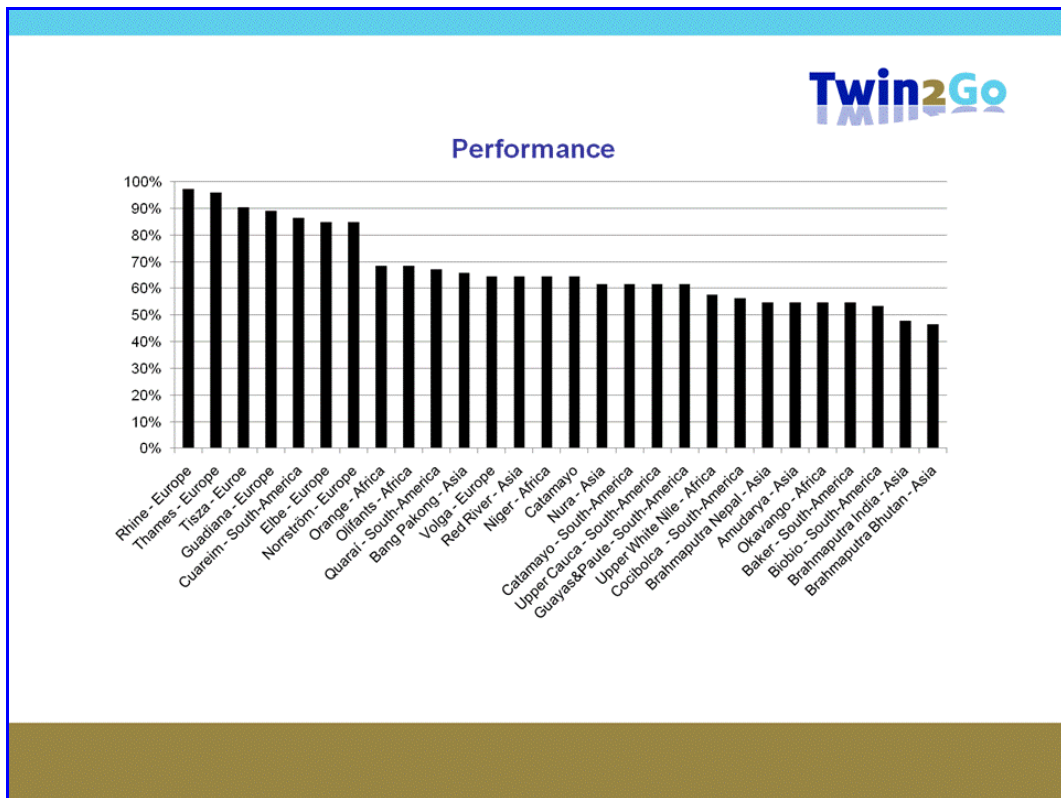*Fig. 3 Ranking River basins by Total score*
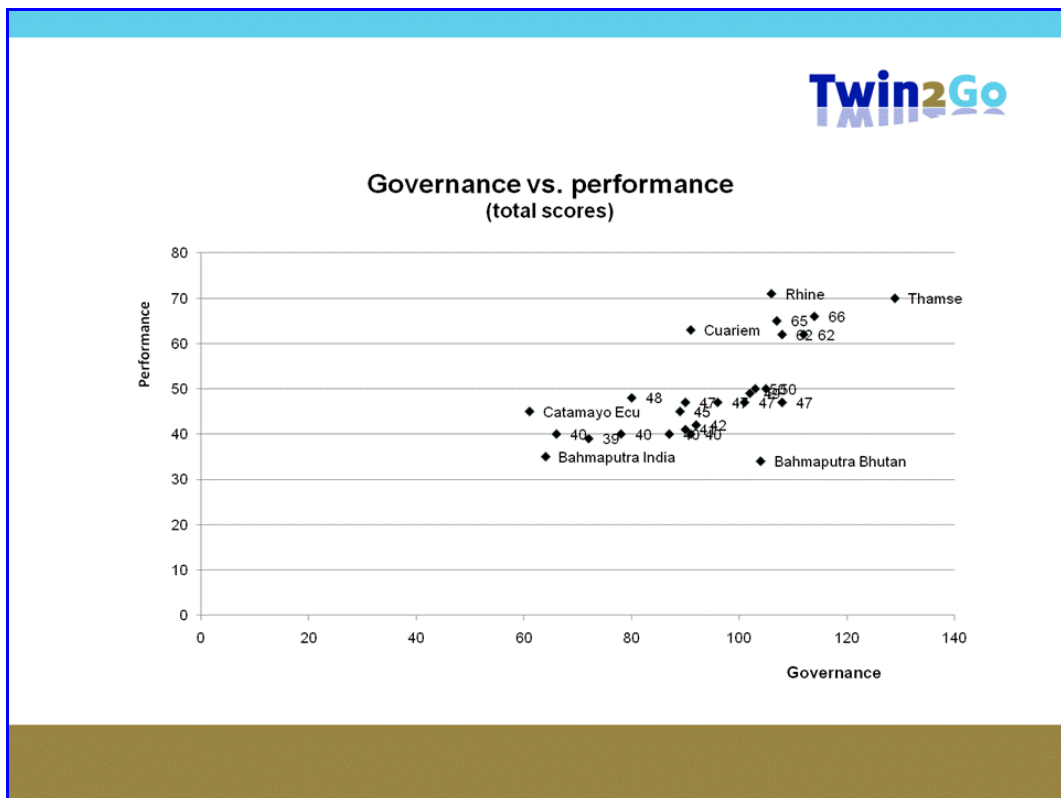
Fig. 4 Ranking River basins by performance score

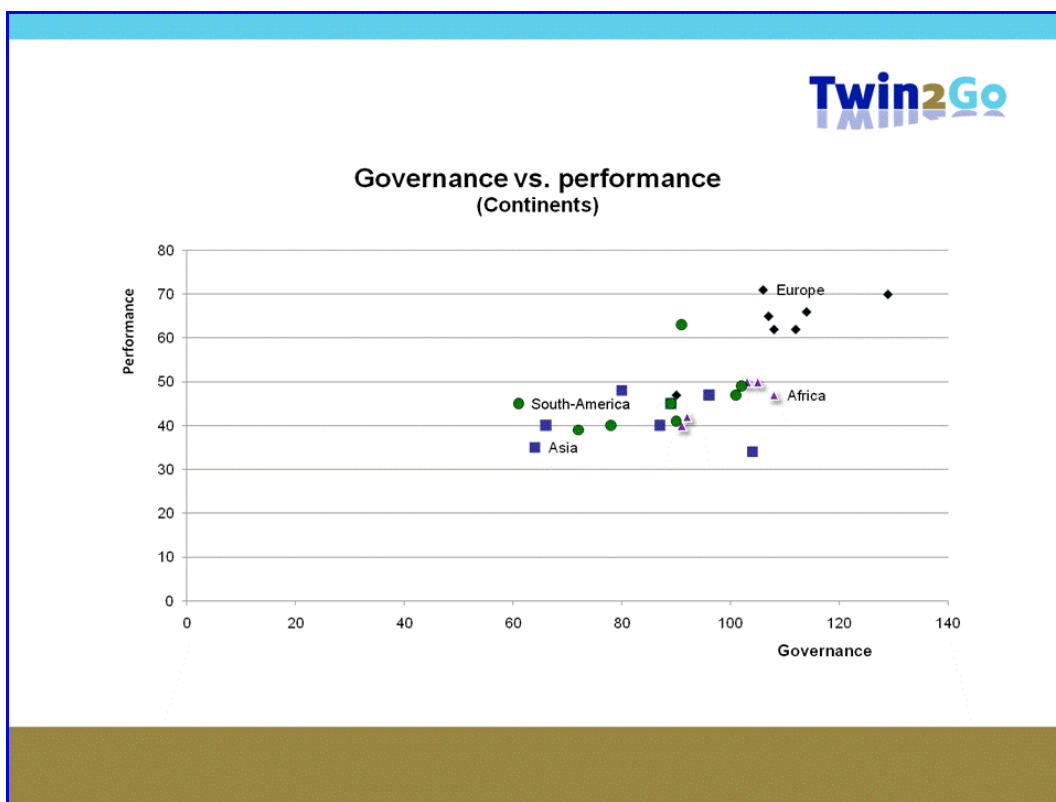**Fig. 5 River basins governance versus performance plot**

Fig. 6 Continents - governance versus performance plot
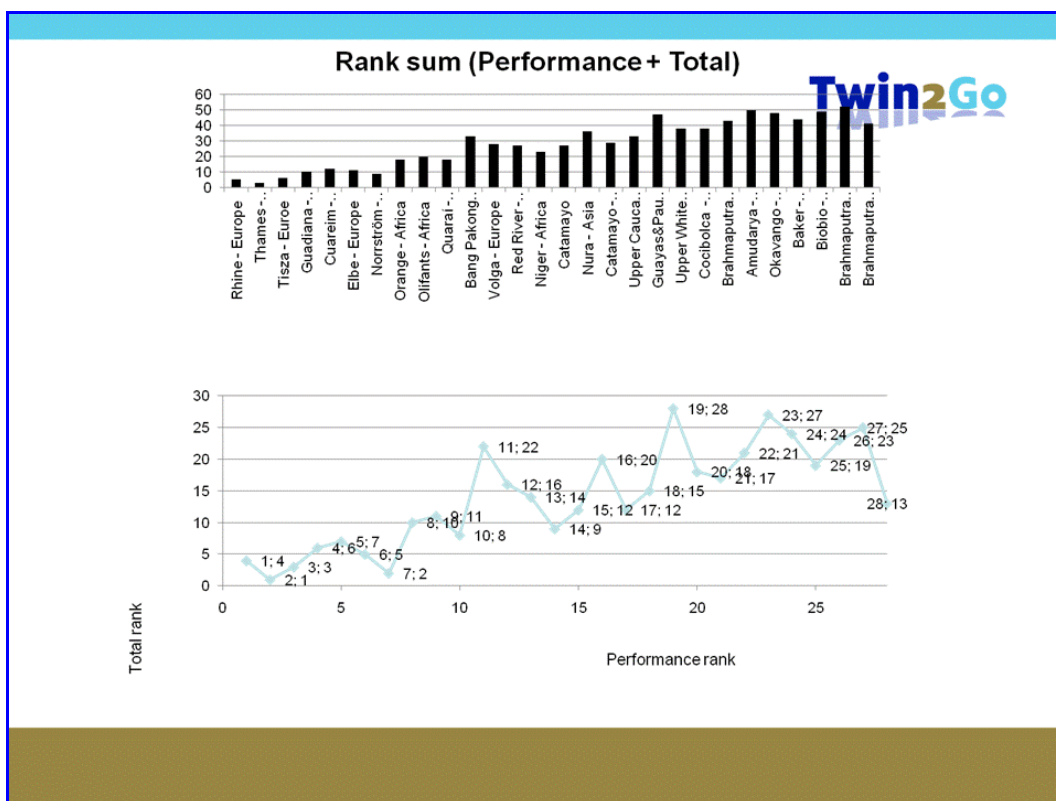

Fig. 7 Ranking and ranking numbers

Group session 3) Working group on regime typologies & context / adaptive capacity; chair: Dr. Louis Lebel

Purpose of the workgroup was to develop ideas on regime typologies. Typologies can be based on similarities among countries or basins. Typologies are about reducing complexity. Not all dimensions should be used but maybe two or three dimensions, which build a group of typologies. Different kinds of typologies or approaches are possible. Typologies can be used in comparing basins and identifying transferability opportunities. They are a pre-requisite for best practices as they can offer some insights on how other factors, context matter. Analyzing one's own basin towards a given typology can trigger discussions and increased awareness.

Ideas for regime typologies
- ❖ Stakeholder (who and how engaged)
    - ○ Equity (voice of the poor)
- ❖ Self-awareness of performance (perceptions vs. reality)
- ❖ Pathways (time) through a 3-way pilot (by places)
- ❖ Level of Centralization By contested-consensual
- ❖ Historical pathways (context)
- ❖ Opportunity set (resource scarcity)
- ❖ Hypothesis-based (e.g. triangle)
- ❖ 'Position' of basin (space, admin, power) – match?
    - ○ Embeddedness, hierarchy, size
- ❖ Discursive-expert contexts : External vs. Internal vs. cooperative water policy-institutional design
- ❖ Responsiveness of regimes to pressures/shocks
    - ○ Template / historical pathways
    - ○ Bureaucratic inertia
    - ○ Flexible and Rigid…
    - ○ Autonomous / self-determination
- ❖ Forward-looking / proactive
- ❖ National democratic institutional development
    - ○ Aid/loans…local innovations as reasons for divergence at basin levels

Group session 4) Working group on best practices / adaptation; chair: Dr. János Fehér

Following the initial outline for work package 3, as presented earlier in plenary, this group went further into the suggested approaches and expectations. A key issue is how the best practices relate to the analytical work done so far in Twin2Go and practices from the twinning projects.

- ❖ A pragmatic approach is suggested; to develop a first list of recommendations based on the analysis for 29 case studies and the results from the twinning projects. Take this list to the regional workshops for discussion.
- ❖ The initial list of good practices should be identified by the Twin2Go partners within the next few weeks, coordinated by the WP3 leader. One way for doing so would be to scan the comments made during the Case Study Review Workshops, which are included in the basin reports, and the questionnaires themselves, A-scores may indicate the presence of best or good practices.
- ❖ Select a few practices (e.g. five) and do a more detailed analysis on these.
- ❖ Good practices should be used as an input to prepare indicators which can then be used to monitor the application of best practices.
- ❖ One aspect to consider is the transferability of the examples for good practices; what are (context related) barriers or enabling factors.
- ❖ The target group, scales or levels need to be known to make recommendations more tailored to the needs. The scale we wish to consider in particular is the river basin (sub-basin or wetland).
- ❖ In selecting or prioritizing good practices we need to focus on practices linked to the governance system. In other words, purely technical measures are not considered in this regard.

❖ The final output could be presented in a toolbox illustrated with best practice examples from the case study basins. The toolbox should contain guidance to the selection of suitable practices in function of specific context factors which could be identified based on the basin analysis. Thus: using a simplified analytical tool the stakeholders can identify which practices could work for them.

Discussion:

❖ What is the role of the next workshops? Is it dissemination and discussion of results or again an asking opinions exercise? It is important not to go empty handed to the Regional Best Practice Workshops with the idea of extracting more information from the available stakeholders. Specially those who have participated previously in the Case Study Review Workshops will expect more input or return from the analytical work which has been done before. Therefore work needs to be put in place to analyse the basin reports and present existing best practices and their applicability.
❖ It is a big opportunity that we have representatives from seven projects who should be able to easily extract best practices from the twinning projects. We could ask this already now. The twinning projects however are very different in nature; some are very modelling-oriented and have not considered much governance aspects.
❖ The scoring is already sort of an indicator of best practices. Where you have A's that is an indicator for best practices. This could be done on a regional basis. And look at best practices and not at bad practices… In a next step you could look at failures. The workshops can have sort of a review function of these identified 'A's.
❖ Should we call these 'best' practices? Or 'good' practices? And what could be the difference for really good and just good? Do we have some sort of thresholds, possibly found in the scoring schemes? E.g. enforcement in general failed but on some points worked well? What is the difference? When talking about criteria for best practices: the existing scores could be used indeed; the A's can be a threshold.
❖ Try to focus on a few practices and try to look in more detail. Why were they good or bad practices? Not only take European basins, but e.g. one from Europe, one Asian… and taking into account the context.
❖ Is there a relation between best practices and policy recommendations? It is interconnected. Ideally we will be able to extract the policy recommendations from the best practices and if possible recommendations for several categories of stakeholders. Here we need to pay attention to the possibility to make generalisations of the transferability. What are the context specific barriers which will not allow us to transfer from one to another, and how can some of these maybe be overcome?
❖ How are we going to prioritise best practices? E.g. if there are no policies but people are able to respond to climate variabilities? How are we going to link – feedback mechanism from the analysis? It is suggested to develop typologies (based on context): categorise the best practice for each type of regime typologies? The weakness of existing toolboxes such as the one of GWP is the analysis of your system to see which tools you need. With the analysis we have developed in WP2, we have some background to link regime, context and performance. If we can see these linkages we can identify 'best practices' in a given situation.

❖ Specific input: What ICIMOD has been doing, for about two years field teams have been recording what people are doing in response to floods and droughts and recoding how the policy measures are enabling or preventing this. Beyond that there are studies in the region (Nepal, …). These can be presented by Mats during the next workshop; it builds on Brahmatwinn.

3.3 Final discussion and closing remarks

Conclusions by the scientific coordinator; Prof. Claudia Pahl-Wostl

One thing which is clear is that we have a huge challenge ahead of us. Even though we are on track, meeting our time schedule will not be easy. Either we proceed with what we have and take this to the next workshops, alternatively we go deeper into the analysis but may need to postpone the workshops. This will be discussed on the consortium meeting following the workshop on September 3 2010.

It has been acknowledged that it is useful to have different analysis approaches, which is increasing the insights. We need to check how robust our results or sensitive our methods are. We need to work on improving the reliability of the data but also the robustness of the method. Also a feedback round from the basins would be desirable.

In terms of performance, the evaluation of basins is clearly a new issue which came to light during the workshop; i.e. capturing the priorities (goals) for the basin and matching these priorities with our analysis.

With regard to best practices, we need to refine and consolidate our approach, making use of the rich knowledge in the basins and the questionnaire.

Beyond Twin2Go: the value – or innovativeness - of the project is already showing. Quite a few people are interested to continue this. One thing which is already being considered in view of continuation beyond Twin2Go is to establish a web database to make data available and allow for adding more cases.

Conclusions by Advisory Board Members: Prof. János J. Bogárdi, Dr. Anil Mishra, Ms. Sonja Koeppel

The progress which has been made is impressive. The objective of the project is to formulate best practice in adaptive water governance in response to climate change. The important words are recommendations, best practices, adaptiveness. We should not miss out on these words.

From the UNESCO side collaboration in organising the regional workshops can be offered. If we are organising similar events we can talk about jointly organising these. Also for the dissemination we can look at collaboration.

It is a very interesting, exciting and pioneering project. It is a project that when it has finished it is not completed. It would be good to develop into sort of a community of interest to continue this. A few things could be considered; results could be extended. 1) Reduce the 86 indicators of the questionnaire – though we first might need to add some (e.g. environmental performance). Try to come up at the end with a reduced set of questions which will motivate people to participate. 2) Twenty-eight catchments is a remarkable number but there are hundreds of big transboundary basins, we are far from having a global coverage. 3) The three interpretation methods are a strong point of the project, also towards potential critical comments. One method will be more preferred by engineers while others will be more liked by social scientists, which means you have an answer for both groups. 4) There could be a clustering of basins in categories.

There are commonalities between the GWSP and Twin2Go; the Global Catchment Initiative holds its conference in December. The other group is the global water governance group. These events will be used for sharing information on Twin2Go.

The web database[4] would be very useful in the future. The aspect of transboundary water management could still be strengthened in Twin2Go. The best practice examples will be a useful output. With regard to dissemination it would be good to come up with some important messages to put in policy briefs[5]. And disseminate on different events, for example at the UN-Water events. Organise dissemination events back-to-back with other events.

Congratulations to the team for the progress made.

Conclusions by the representative of the EC: Christos Fragakis

We fully subscribe what has been summarised. It was a great opportunity to be here, because I realise the complexity of the project but also the potential. Let us try to bring forward the uniqueness of the

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[4] Deliverable 4.2.2
[5] Deliverable 4.3.3

project. If the issue of extension is holding the project, extension (within the same budget) can be considered as it is important to have a good analysis to take to the stakeholders.

The future after Twin2Go; future projects can be asked to contribute data to the database. Let us try to be as profound as you can, do your planning based on how much time you need!

<u>Final discussion</u>

- ❖ Remarks on the comments; there are policy briefs planned in Twin2Go. The value of these is going to be the richer information behind the messages; therefore a certain level of detail should not be avoided.
- ❖ It is suggested to search for basins to test or validate the Twin2Go methodology. E.g. a river as the Indus has a lot of data, and there is room for future collaboration
- ❖ We have to be cautious about the idea that we capture good examples and transfer them to other basins. We are looking forward to further interact in the region. We could take the results of this analysis and take it in the policy dialogue in the Mekong group as a validation exercise.
- ❖ WETwin can already benefit from the experience of Twin2Go; some insights will already be taken into account in the work on governance and institutional capacity assessment in the wetland context. As a teacher in UNESCO-IHE I will also take some of the knowledge from Twin2Go in my lectures.
- ❖ A list of activities to be dealt with after Twin2Go would be useful as message to the scientific community and to the Commission; what is the next step forward?
- ❖ We may now use the umbrella of Twin2Go to start adding new basins, preferably the larger ones. Including North-American basins. Adding basins could start during Twin2Go, although analysis may not happen on the new sample. If we include larger basins we should add them as national cases. A next step would be to develop a good framework to analyse transboundary regimes, the current method is not well set up for this.
- ❖ Adding a Mekong Vietnam, and Mekong Cambodia could be feasible (Louis, Sinh). As well as adding Upper Rio Grande in the US (David). Another possibility is to have data from the STRIVER project, but so far this request has not been successful. Craig can help to get Dundee University, and Irina can contact another partner from AWARE. Claudia can try to get something in Australia. Sonja can see if she can find place in upcoming workshops to add a session. Anil is coordinating an event in Chile in 13-17 December in Valparaiso. DHI is engaged in some activities in Ghana, the water resource commission could be asked to add data.
- ❖ Some training session could be necessary to facilitate the filling in of additional case study questionnaires, we could try to do this in December (Conference of the Global Catchment Initiative).
- ❖ Some possibilities for joint publications have been identified on the outcomes of the analysis. Either packaging results according to the different analyses or more packaging in topics. An alternative might be to consider a book instead of papers because not all material is adequate for publishing as papers. This will become clearer as we progress.
- ❖ To prove validity we need to have peer reviewed papers. But to reach a larger audience we need to add more accessible information on the website. Possible products are: publications, policy briefs, website, …
- ❖ Remark: Adaptation is an important aspect in the project but good examples may not be available in existing or previous projects. The problem is that there is not yet much to measure adaptation measures' performances, because it is too new. We can only evaluate strategies and plans to go in adaptive measures.
- ❖ The FP7 has two more years which is two more calls or alternatively one call for two years. FP8 is being discussed. It is going to look different. Barroso announced Europe 2020 strategy trying to link research to innovation. At the end of December there is going to be a communication on the political vision. Many new instruments are being proposed. Water is one of the candidates to implement a new instrument mix. The Commission is going to play the role of facilitator for member states in implementing research. By middle 2011 the ideas will be more crystallised.

Annex 1: List of participants

Nr.	Name	Organisation
1	Christian Knieper	USF
2	Anita Bartosch	FSU Jena
3	Bach Tan Sinh	National Institute for Science and Technology Policy and Strategy Studies, Hanoi, Vietnam
4	Jian Xu	ICRAF
5	Louis Lebel	USER
6	Alexander Ivanov	Nizhny Novgorod University for Architecture and Civil Engineering
7	István Zsuffa	VITUKI
8	János Fehér	VITUKI
9	David Groenfeldt	Water and Culture Institute
10	Craig Hutton	GeoData Institute, University of Southampton
11	Sonja Koeppel	UNECE
12	Tom D'Haeyer	Soresma
13	Jan Cools	Soresma
14	Edi Interwies	InterSus
15	Irina Comardicea	Adelphi
16	Elena Ostrovskaya	UNESCO-IHE
17	Claudia Pahl-Wostl	USF
18	Palle Lindgaard-Jørgensen	DHI
19	Maja Schlüter	Leibniz-Institute of Freshwater Ecology and Inland Fisheries (IGB)
20	Kim Raben	DHI
21	Elena Nikitina	EcoPolicy
22	János J. Bogárdi	GWSP
23	Anil Mishra	UNESCO-IHP
24	Christos Fragakis	European Commission, DG Research
25	Lennart Sorby	Lansstyrelsen / County Administrative Board
26	Malin Petterson	Lansstyrelsen / County Administrative Board
27	Mats Eriksson	ICIMOD
28	Mats Lannerstad	SEI
29	Carl Folke	Stockholm Resilience Centre
30	Jens Heinke	PIK

Annex 2: Workshop agenda

Day 1 – start at 14:00

13:00 – 14:00	<u>Arrival</u> participants (provide some drinks…); <u>Registration</u> at the reception area at SRC.
14:00 – 14:30	Welcome & opening by Dr. Claudia Pahl-Wostl (scientific coordinator Twin2Go) & by representative of the Stockholm Resilience Centre. Followed by brief introduction of participants.
14:30 – 14:45	Introduction on Twin2Go (objectives, roadmap and current progress): Dr. Claudia Pahl-Wostl
14:45 – 15:15	Methodology: questionnaire and conceptual background by Dr. Claudia Pahl-Wostl
15:15 – 15:40	Overview of review workshops and basins / data summary table by Elena Nikitina & Jan Cools
15:40 – 16:00	break
16:00 – 16:20	Analysis 1: Hypotheses + exploratory qualitative analysis by Dr. Claudia Pahl-Wostl
16:20 – 16:40	Analysis 2: Statistical analysis by Dr. Louis Lebel
16:40 – 17:00	Analysis 3: Cross tab interpretation by Christian Knieper
17:00 – 18:00	Discussion on approaches / feedback from participants
19:00	Group dinner

Day 2 – start at 09:00

09:00 – 09:15	Introduction of day 2 (incl. brief summary of discussion day1)
09:15 – 11:30	Parallel working groups, (including possibility for short statements6 by participant: 1) Working group on methods (data collection, statistics, and other); chair: Jan Cools 2) Working group on performance measures - comparing basins / ranking basins; chair: Dr. István Zsuffa
11:30 – 12:00	Feedback in plenary
12:00 – 12:30	Presentation on best practices (WP3) by Elena Nikitina
12:30 – 13:30	Lunch
13:30 – 15:00	Parallel working groups, (including possibility for short statements by participant: 1) Working group on regime typologies & context / adaptive capacity; chair: Dr. Louis Lebel 2) Working group on best practices / adaptation; chair: Dr. János Fehér
15:00 – 15:30	Feedback in plenary
15:30 – 15:50	Break
15:50 – 16:05	Important conclusions for Twin2Go; Dr. Claudia Pahl-Wostl
16:05 – 16:50	Feedback from the advisory board / Feedback by Christos Fragakis (European Commission, DG Research)
16:50 – 17:20	Opportunity for discussion on conclusions
17:20 – 18:00	Discussion on final products and dissemination + beyond Twin2Go7 Closing: by Christos Fragakis "Commission looking ahead"

Day 3 – start at 9:00

09:00 – 15:30	Consortium meeting (Twin2Go & Advisory Board members) (Optional: further discuss on the synthesis with experts)

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[6] Participants are offered the opportunity to briefly share insights from their own work experience considered relevant for the working group topic.

[7] Identify opportunities for publication, dissemination of Twin2Go results and continued research