



NeWater

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WP 3.3 THE ELBE BASIN

**STAKEHOLDER REPORT – REVIEWING
AND REVISING NEEDS FOR RESEARCH,
TOOLS AND CAPACITY BUILDING**

**Report of the NeWater project, WP 3.3
New Approaches to Adaptive Water Management under Uncertainty
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1 Introduction: major problems in the basin and goals of the stakeholder process

The Elbe River basin covers large parts of two countries - the Czech Republic and Germany. About 2/3 of the drainage basin area (148,268 km²) is located in Germany (96,932 km²), and 1/3 - in the Czech Republic (50,176 km²), and a negligible part of the basin is located in Austria and Poland. The basin covers different geographical regions from middle mountain ranges in the west and south to large flatlands and lowlands in the central, northern and eastern part of the basin. About 25 million inhabitants live in the basin, therein 76% in Germany.

The river basin is used for various purposes. Agriculture areas occupy 56% of the drainage basin, and 25% are covered by original forest. The industrial sector withdraws the largest amount of river water (about 70%), followed by the agricultural sector and the water withdrawals for domestic use (both about 15%) (Kliot, Shmueli et al. 2001). The water management in the whole Elbe basin is well developed and has a good potential to introduce IWRM. However, cross-sectoral and transboundary co-operation should be substantially improved [1].

The Elbe River is experiencing all three major water-related problems [2], [3]: having too much of water from time to time (floods), too little of water often in summer season (droughts), and having water of inadequate quality. In the last three years, extreme hydrological situations were observed on the Elbe - a destructive flood in August 2002, and a severe water deficit only one year afterwards. Besides, the Elbe is a major contributor of nitrogen and phosphorus loads to the Northern Sea.

A detailed description of stakeholders in Elbe basin is given in [2]. The goals of the stakeholder process in the Elbe basin are manifold:

- participative definition of the major research issues in the basin (questionnaire surveys);
- collaboration with stakeholders in three subbasins chosen for modelling, the collaboration is aimed in a precision of modelling purposes, data support, and communication and evaluation of results;
- finding a way how to better use the “technical” results (ecohydrological modeling, impact assessment, scenarios) for “soft” issues (real water management in view of ongoing climate and land use change), and to show stakeholders how elements of adaptive management could be implemented in the concrete conditions;
- discussion of specific topics related to NEWATER objectives (IWRM, uncertainty, adaptive management) with stakeholders at the workshops;
- improving the dialogue between different levels and groups of stakeholders.

2 Activities involving stakeholders until June 2007

The following activities involving stakeholders were conducted in the Elbe basin in the period from January 2005 until June 2007:

1. First Questionnaire
2. Workshop in the Jizera catchment in October 2005
3. Second Questionnaire
4. Modelling and collaboration with stakeholders in the Rhin catchment
5. Modelling and collaboration with stakeholders in the Jizera catchment
6. Modelling and collaboration with stakeholders in the Malse/Rimov catchment
7. Research on institutional adaptation to climate change in the German part of the basin



8. Uncertainty workshop in Leuven, June 2006
9. Stakeholder Workshop on Perception of Uncertainty, Prague in May 2007
10. Identification of challenges for adaptive water management

1. First Questionnaire. In order to define major research issues in the Elbe basin, the “Questionnaire on major water-related problems and research needs in the basin” was distributed to stakeholders in German and Czech parts of the basin. All major groups of stakeholders were involved in the action: policymakers at the federal and state levels in Germany and at the ministry level in the Czech Republic; water managers; people working at the water supply and sewage water treatment enterprises; representatives of agriculture enterprises and farms, mining and water transport; people involved in spatial planning and nature protection, representatives of NGOs and scientists involved in water resources research.

Besides, the Questionnaire was distributed among 100 randomized private households of the village Glindenberg (ca. 1300 inhabitants) located very close to the Elbe River (about 1 km) in Saxony-Anhalt (Germany). The village was affected by the Elbe flood in August 2002, all citizens were precautionary evacuated, but no serious water damage occurred. This village was chosen in order to include also some citizens and evaluate the opinions of people directly impacted by flood. The fact that “real” people were also asked was very positively accepted by Czech stakeholders, although it was done only in the German part of the Elbe basin.

Altogether, 376 Questionnaires were sent in Germany, 242 in the Czech Republic, and 100 were distributed in Glindenberg. From 718 distributed Questionnaires, 240 filled Questionnaires were obtained back (approximately 33%): 127 from the German stakeholders (30 of them from Glindenberg), and 113 from the Czech stakeholders.

The obtained filled Questionnaires were evaluated separately for every of three groups (German major group, Glindenberg, Czech group), and further for every major stakeholder group. If the stakeholder indicated several fields of activity (e.g. water management and policy), his/her responses were taken into account for all indicated groups. Therefore, more responses were evaluated than the questionnaires obtained back. In total, 157 responses were evaluated from the German major stakeholder group, 30 responses from inhabitants of Glindenberg, and 200 responses from the Czech stakeholders (altogether 387 responses). For details please see [2].

The results of the First Questionnaire are presented in three papers:

- Martínková, M., Blažková, Š., Hesse, C., Krysanova, V., Košková R.: Jaky vyzkum je potreba v povodi Labe? (in Czech), *Vodohospodářské technicko-ekonomické informace*, Vol. 48 (2), 2006, pp. 7-10;
- Hesse, C.; Krysanova, V.; Blažková, Š.; Martínková, M.; Košková, R.; Möllenkamp, S.; Gräfe, P.; Wechsung, F., 2007: Probleme und Forschungsbedarf im Elbegebiet: Ergebnisse einer Stakeholder-Befragung. *Hydrologie und Wasserbewirtschaftung*, 51, H. 2, 82-88;
- Košková, R., Krysanova, V., Hesse, C., Blažková, S., Martínková, M., Němečková, S.: Case Study Elbe – a part of the project Newater, *Conf. Proceedings Workshop Adolfa Patery 2006 – Hydrological Events in Catchments* – 15. November 2006, in print;

The opinions of different groups were different. Altogether, stakeholders from Germany and Czech Republic identified the following first-priority water-related problems: (1) flood intensity, (2) water quality: diffuse pollution, and (3) summer droughts, and the following first-priority research needs: (1) climate impact on water availability, (2) flood risk, and (3) water quality. Based on that and keeping in mind major objectives of the NeWater project related to Integrated Water Resources Management and Adaptive Management, the following two major research issues were formulated for the Elbe Case Study in the NeWater project:



- Incorporating climate variability and climate change into IWRM with emphasis on floods and droughts, and
- How the ongoing changes in land use and climate influence water quality, and what are the implications for integrating water quality and water quantity issues in IWRM.

Of course, these two research issues are very wide and ambitious, and the Elbe CS team even with the support of other Work Packages of NeWater and stakeholders does not pretend reaching these research objectives fully in time of the project duration. This is rather the direction where to go.

The publications, especially in national languages, proved to be good artefacts to communicate feedback of the questionnaire results and other NeWater activities. The publications in national language are understandable for all stakeholders, which are not used to read in English. The publications were distributed during the follow-up meetings with stakeholders in both parts of the Elbe basin. After the publication several stakeholders showed their interest in further details and in discussion of presented results.

2. Workshop in the Jizera catchment. Major problems and research needs specifically for the Jizera catchment were identified with stakeholders at the workshop in the Jizera catchment in October 2005. The Jizera basin (North-East Bohemia, about 2000 km²) was chosen as one of the subbasins for ecohydrological modeling and cooperation with stakeholders in more detail. The subbasin was chosen in cooperation with key stakeholders (Czech Ministry of Agriculture and Czech Ministry of Environment) for the following reasons:

- location of a very important water treatment plant Karany,
- developing tourism and building industry in the mountains,
- agriculture in lowland,
- possible lack of water and water quality degradation in future due to impacts of climate and land use change.

Representatives of several groups of stakeholders were invited by letters. Main aim of the NeWater project and the content of the workshop including questions to stakeholders were described in the letter. As a venue for workshop Nova Louka in Jizera mountains was chosen. The invited stakeholders were:

- representatives of Czech Ministry of Agriculture and Ministry of Environment,
- representative of the International Commission for the Protection of the Elbe,
- representatives of a respective water board,
- representatives of the Karany water plant,
- representatives of water managers from the Jizera catchment.

Other participants were the Elbe CS team members, a representative of the GLOWA-Elbe project, and WRI researchers dealing with water quality. Number of participants was 20. The interpreting was provided during the workshop. Participants could feel free to communicate without any language problems, and local stakeholders could feel that German scientists are interested in their problems.

Main task of the workshop was to define major problems of water management in the Jizera and research needs of different stakeholder groups. In the beginning, the list of main problems (based on the results of the First Questionnaire and discussion during the workshop) was established. Then the individual stakeholders defined priority of the listed problems. In the following discussion individual stakeholders explained the priorities of problems from their point of view. Thanks to friendly atmosphere, different stakeholders explained their attitudes freely. Although the stakeholders were from different administrative levels, this was not emphasized as they were all sitting at one table.

As a result, the following major research needs were identified at the workshop: drought impact on water availability, water quality modelling, and land use change impacts.



3. Second Questionnaire. PIK in cooperation with WRI and IHAS continued stakeholder activities in the basin by distributing 2nd Questionnaire about “Information and research results needed by stakeholders in order to (a) better incorporate climate change into water management, and (b) better integrate water quality with water quantity in water management in the Elbe basin”. This second Questionnaire is focused on the opinions of “water professionals”. Therefore the number of respondents was lower and the questions were more specific. The responses were collected from Germany and Czech Republic and analysed.

The paper describing results of this questionnaire (Martinkova et al.) is now in press. The paper, summarizing the questionnaire responses, is aimed first of all for water management experts in the Elbe basin. First question was about climate change impact scenarios and related water problems. Second question was about research results that stakeholders need in order to better integrate water quality with water quantity in water management in the Elbe basin. The research issues suggested in the questionnaire were, for example: information about uncertainty ranges in prediction of precipitation under climate change; estimation of trends in water use index for the Elbe subbasins; frequency of floods according to major climate change scenarios, and reliability of such predictions; source apportionment of nutrient load for subbasins using dynamical process-based models or statistical models; analysis of pollution load for other pollutants; scenarios of land use change effects; scenarios of agriculture management; scenarios of changes in water-related sectors and cost-effectiveness analysis.

This submitted paper, as well as previous publications of the Elbe team, will be an important tool of communication with different groups of stakeholders. The current discussions in the Czech Republic about “global climate change: is it ongoing or not” could be enriched by this paper, which describes the expert opinions from both countries: Czech Republic and Germany.

4. Modelling and collaboration with stakeholders in the Rhin catchment. PIK is providing requested modelling results to the stakeholders from the Federal Environmental Agency of Brandenburg (LUA). The LUA objective is to develop an implementation plan of the Water Framework Directive (WFD) for the Rhin catchment (a representative catchment for the State of Brandenburg). The modelling results are used to support the implementation of WFD.

For that, PIK has regular monthly or bi-monthly work-group meetings with stakeholders from the LUA involving 5-7 people. On the request of LUA, water quality modelling and scenario analysis are being done for the Rhin catchment. The results are presented and discussed, and further steps in research and data acquisition are identified during these meetings.

One paper describing the results is submitted

Hesse, C.; Krysanova, V.; Hattermann, F., 2007. Water Quality Modelling in a Highly Regulated Lowland Catchment. Presentation and paper for the IV. International SWAT conference, 04.-06.07.2007,

and a report and another paper are under preparation now.

5. Modelling and collaboration with stakeholders in the Jizera catchment. WRI has a long-term collaboration (regular meetings) with stakeholders in the Jizera catchment in Czech Republic. According to the identified research needs at the Jizera Workshop in October 2005, several research tasks were defined, which were carried out by WRI in 2006:

- a) climate and hydrological data were collected and analysed for water quality modelling in the Jizera subbasin. Reliability of the data was discussed with stakeholders;



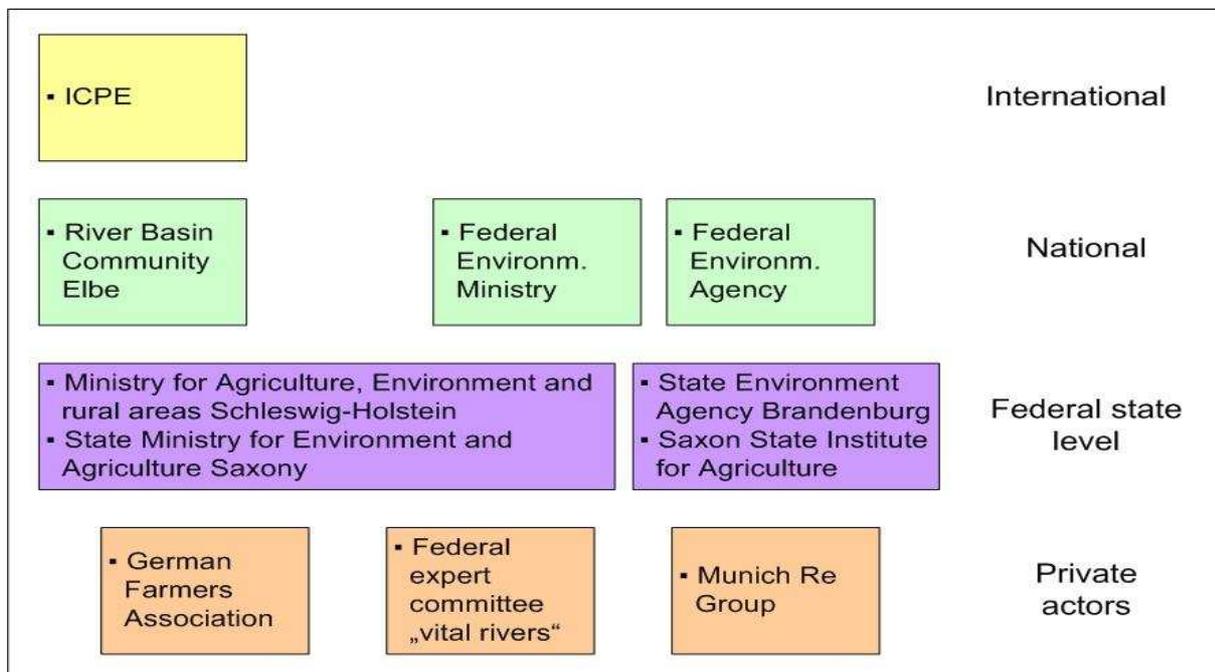
- b) soil data essential for modelling in the Jizera subbasin were prepared. Reliability of the data has been discussed with stakeholders;
- c) land use data for the Jizera subbasin were updated;
- d) the SWIM model for the Jizera subbasin was calibrated (in collaboration with PIK).

6. Modelling and collaboration with stakeholders in the Malse-Rimov catchment. The stakeholder process in the subbasin Rimov has continued by the Institute of Hydrodynamics (IHAS) conducting individual interviews with main stakeholders (branches of drinking water supply and agriculture management). The needs of integration of agriculture practices with drinking water management have been discussed.

The water supply function is dominating in the Malse basin. A large water reservoir providing drinking water to the city Ceske Budejovice in the South Bohemia is located there. According to the priorities identified by the First Questionnaire, IHAS is focusing on the water quality needs and problems connected to the floods in the Malse basin. The accent is given also to the adaptive approach in the basin management taking into account the impact of climate change. Thus, the respective objective of the working team was to interview the stakeholders about the concrete situation in the catchment and identify their opinions about needs and actions needed in order to improve water management in the catchment. The next important point in the stakeholder process in their support is local data collection.

7. Research on institutional adaptation to climate change in the German part of the basin. USF is researching on the question if and how institutional adaptation to climate change takes place within the German part of the Elbe basin. Main emphasis is put on water management and agriculture.

To this aim, desk study research was undertaken and expert interviews were conducted. Experts were chosen within the German part of the Elbe basin in order to elicit knowledge and reflect opinions of different groups concerned with the question of institutional adaptation. The following figure shows the experts that were interviewed:





The form of interaction was chosen because the aim was to elicit knowledge and make visible how the interview partners who are themselves involved in any possible change of institutions in the Elbe basin frame the question of institutional adaptation towards climate change.

The interviews were evaluated using an analytical framework developed beforehand. Also information that did not fit into the framework was taken into account.

A first analysis of the interviews was presented to stakeholders in the Elbe basin during the workshop on uncertainties in Prague in May 2007 („Perception of uncertainty in water management by stakeholders and researchers“), where some of the interviewed experts also took part.

8. Uncertainty workshop in Leuven, June 2006. PIK in cooperation with WRI and IHAS suggested three stakeholders from the Elbe basin for interviews about uncertainty in water management. The interviews were done before the uncertainty workshop, which was held in June 2006 in Leuven. The results of the interviews were used as a basis for analysis of uncertainties in water management during the workshop. The interviews were conducted by M. Brugnach and Nicola Isendahl (USF).

9. Stakeholder Workshop on Perception of Uncertainty, Prague May 2007. The workshop on “Perception of Uncertainty by stakeholders and researchers in Water Management” was held in Prague in May 2007. The invitations to the workshop were sent in December 2006, accompanied by a request to suggest issues for discussions during the Workshop. During the preparatory phase, several interviews with stakeholders in Czech Republic and Germany were conducted. The objectives of the Workshop were:

- (a) to inform stakeholders about state-of-the-art research concerning flood protection, water quality and climate change and related uncertainties,
- (b) to discuss the ways and strategies to cope with uncertainties in flood management and water quality management in the Elbe basin, and
- (c) to discuss the role of research in coping with uncertainty in water management.

Major issues (sources) of uncertainty in flood management and in water quality managements were revealed via personal or group interviews, or via questionnaire responses by stakeholders and invited scientists before the workshop. The group discussions at the workshop were on the issues suggested by all participants. The results of the group discussions during the workshop are analysed and summarised now. All presentations at the workshop and the summary of the group discussions will be put on the NEWATER webpage.

10. Identification of challenges for adaptive water management. Main challenges for adaptive water management in the Elbe basin have been identified in close collaboration with stakeholders (interviews, two above-mentioned workshops, work-group meetings):

- Improvement of flood preparedness in view of expected higher flood frequency (climate change);
- Better water management and adjusted land use in agriculture in case of higher frequency of droughts (climate change);
- Improvement of water quality in the Elbe and its tributaries (reduction of pollution from diffuse and point sources); Therefore water quality modelling for identifying sources of pollution and appropriate measures to control pollution is very important.



- Transboundary Czech-German dialogue on water management. (The workshop on Uncertainty in Prague in May 2007 (see above) is a contribution to such dialogue).

3 Responses on the specific questions guiding the reporting

1. Factual elements of stakeholder involvement in the case study

a. Who have been the people involved in the case study and what have been their roles (researchers, case study coordination team, various stakeholders, please describe in a bit more detail especially the various categories and roles of stakeholders).

- researchers: the Elbe team (PIK, IHAS, WRI, USF)
- stakeholders responded to the First Questionnaire
- stakeholders responded to the Second Questionnaire
- stakeholders interested in support for decision making in three subbasins: Rhin, Jizera and Malse/Rimov, which were chosen for detailed study by the CS team and stakeholders
- stakeholders from the Jizera catchment participated in the workshop in October 2005
- Czech and German stakeholders participated in the Uncertainty Workshop in Prague in May 2007

b. What have been their respective objectives?

- their respective objectives were defined by the objectives of the corresponding activity. Please see the details above.

c. What kinds of artefacts have been used in the interactions with the stakeholders and how did this usage impact on the quality of the exchanges?

- reports of the environmental agencies,
- publications about the Elbe basin,
- results of modelling (graphs, tables, maps)
- publications by the Elbe team
- publications of other WPs of NeWater

d. What kinds of participatory methods have been used? By whom and on which basis were they chosen? Please describe your overall case study approach here including meetings and other strategies of exchange. Please also say if you used any indicators to assess this participation in the research.

d1. Questionnaires, interviews, long-term work-group meetings, workshops on local, national and international levels

d2. Mainly by the team, partly by stakeholders; on the basis of reasonability and feasibility

d3. See description above, activities 1-10.

d4. No indicators were used.



2. Dynamics of the case study objectives in relation with involvement of stakeholders

a. With regard to the initially-stated objectives, how have the overall objectives of the case study evolved until now?

- the overall objectives of the Case Study did not change, but the methods of research have been developed further in order to meet the objectives as far as possible,
- it was clear from the beginning that the initially stated objectives of the Case Study:
 - Incorporating climate variability and climate change into IWRM with emphasis on floods and droughts, and
 - How the ongoing changes in land use and climate, in land and water management influence water quality, and what are the implications for integrating water quality and water quantity issues in IWRM

cannot be fully implemented. Therefore in the RAP [3] was written: “these two research issues are very wide and ambitious, and the Elbe CS team even with the support of other WPs of NeWater and stakeholders does not pretend on fulfilling these research objectives fully in time of the project duration. This is rather the direction where to go“. Now it is even more clear. Besides, in the team’s opinion, the implementation of these objectives requires a strong motivation from the stakeholders side, not only from the researchers.

b. Which part of this evolution (if any) can be attributed to the stakeholders (please specify the respective stakeholders)?

c. To what extent these objectives have been shared by the various stakeholders and researchers? This can be tracked back through ex post reflexive analysis of changes in objectives, as well as through the current thoughts among stakeholders on the objectives of the case study.

- the objectives were defined by the research team taking into account responses of stakeholders. Therefore they were accepted and shared by the researchers. To our knowledge, the stakeholders recognise these objectives as important for the whole Elbe basin as well, but their own current objectives could be more concrete, more narrow, focused on a specific area, or different. Therefore the stakeholders need advice from the researchers on their concrete practical problems and projects. Offering them theoretical abstract definitions on adaptive management, IWRM, uncertainty, etc. without any concrete examples of implementation and problem solving methods seems to be quite far from their interests. This should be taken into account in future.

3. Factors driving stakeholder involvement

a. At the outset of the process and with regard to implying the stakeholders what were the most important factors that had to be taken into consideration?

- stakeholders involvement should correspond to the applied participative methods (different groups for different purposes),
- concrete interests and problems of the stakeholders should be taken into account in the process, as stakeholders are not interested in getting only theoretical knowledge about concepts of adaptive water managements, but a real focus on their concrete water management problems and issues, and support in finding solutions in the rapidly changing conditions of water management,



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- researchers interested in communication with stakeholders must have a clear understanding of the water management problems in the basin under study.

b. How did you take these factors into consideration in the implementation of the process?

- by focusing on the concrete problems in our research,
- by organising stakeholder workshops in such a way that discussions are focused on the concrete issues and problems,
- by trying to enhance our own understanding of the problems in the basin and possible solutions.

c. What other factors and events have influenced the case study process during its implementation?

d. How have these factors been dealt with?

4. Future steps

a. What are the most important considerations for the remainder of the process?

- Future steps of the stakeholder process in the Elbe CS will be connected to finding solutions for the problems in the subbasins under study and communicating them to stakeholders. Adaptation of the Newater tools for the selected subbasins is also ongoing. The CS team recognizes that it is important to show the results that could be really implemented in the practice.
- The CS team needs advice on how to adapt the more general Newater results and findings for presentation to the stakeholders in the scope of the defined needs.

b. Further needs in conducting stakeholder processes

c. Next stages to be implemented in continuity with current stage

Additionally to that textual part of the report, we suggest a schematic representation of stakeholder processes since the beginning of the project, made as a chronicle made of:

- **major events**
- **evolution of level of activity in the project for the various categories of stakeholders concerned by it**
- **evolution of research activities (among the following categories: research setting, field work, modelling, analysis, reporting, knowledge management)**



	Major events	Research activities	Level of stakeholder's activity
1	First Questionnaire	Questionnaire setup, analysis of results, papers writing, reporting of results	Wide group of stakeholders from the whole basin
2	Workshop in the Jizera catchment, October 2005	Workshop planning, analysis of results, planning of further research based on these results	A group of stakeholders from the subbasin Jizera
3	Second Questionnaire	Questionnaire setup, analysis of results, paper writing	A small group of decision-makers in the basin
4	Modelling and collaboration with stakeholders in the Rhin catchment	Research setup, data collection, modelling, analysis of scenarios, analysis of the results, papers and reporting of results	Governmental stakeholders interested in the research for this subbasin to implement WFD
5	Modelling and collaboration with stakeholders in the Jizera catchment	Research setup, data collection, modelling, analysis of scenarios, analysis of the results, papers and reporting of results	Stakeholders interested in the research for this subbasin
6	Modelling and collaboration with stakeholders in the Malse/Rimov catchment	Research setup, data collection, modelling, analysis of scenarios, analysis of the results, papers and reporting of results	Stakeholders interested in the research for this subbasin
7	Research on institutional adaptation to climate change in the German part of the basin	Research setup, interviews	Selected stakeholders interested in the topic
8	Uncertainty workshop in Leuven, June 2006	Selection of stakeholders for interviews	Selected stakeholders interested in uncertainty issues
9	Stakeholder Workshop on Perception of Uncertainty, Prague May 2007	Creating of the workshop outline, inviting stakeholders and key scientists, selecting issues for group discussions, analysis of results, summarising results and presenting them in a report	Stakeholders in the basin interested in uncertainty in water management (transboundary)
10	Identification of challenges for adaptive water management	Analysis of results of questionnaires, workshops, interviews; analysis of research results in the basin (including own results).	A wide group of stakeholders from the whole basin



4 Policy Summary

Main challenges for adaptive water management in the Elbe basin have been identified in close collaboration with stakeholders as following:

- better water management related to floods and droughts in view of climate change;
- improvement of water quality in the Elbe and its tributaries;
- enhancement of transboundary Czech-German dialogue on water management.

This Summary includes some insights and recommendations in relation to flood management, which are derived from the Summary of group discussions between stakeholders and scientists during the Prague Workshop on “Perception of Uncertainty by Stakeholders and Researchers in Water Management”. The full version can be found on the NeWater webpage.

The Workshop participants agreed that an **Integrated flood protection strategy** with different types of measures is necessary in the Elbe basin. Integrated flood protection assumes a combination of adaptive and preventive measures, which represent a potential tool for decreasing uncertainties in the strategy against harmful effects of floods in changing climatic conditions. The basis of prevention are structural or technical measures meaning an increase in the flexibility and efficiency of water management systems (like construction of dams and reservoirs, etc.). The non-structural adaptive measures include: preliminary measures, like modernisation and extension of floodplains, enhancement of infiltration and retardation of water, agriculture practices reducing runoff, development of forecasting and warning systems, etc., and reactive measures, like increasing the efficiency of water management structures in non-stationary conditions, efficient delivery of information and warnings to the populations at risk, timely evacuation of the public, post-flood recovery, etc..

The Workshop participants made concrete suggestions related to implementation of the Integrated flood protection strategy in the Elbe basin:

- protection against floods using only technical control measures is not possible in the basin, and non-structural measures are also needed;
- extension of floodplain areas is necessary in the basin, but often it is not easy or not possible to realise (e.g. experience shows that if more funding becomes available, money is often spent for building higher dikes, and not for dike relocation or extension of floodplain); better planning in concrete conditions and control on provided funding are needed;
- the stepwise approach of the Water Framework Directive should be also applied for flood risk management;
- in small watersheds installing automatic warning systems with a link to a permanently staffed service centre can be a good solution;
- uncertainties related to the flood forecasts should be communicated to stakeholders and inhabitants; people should not believe in exact numbers, they have to be aware about involved uncertainties and should not expect exact forecasts;
- insurance agencies and firms should offer the combined insurances in order to reduce their risk.

Beside these general assessments and recommendations on improvement of water management policy for the whole Elbe basin, the Case Study team is also working on concrete policy recommendations for three sub-catchments of the Elbe basin: Rhin, Jizera and Malse/Rimov. The recommendations will be communicated to decision makers working on implementation of Water Framework Directive in the corresponding subregions of the Elbe basin. They could be helpful for improving water management related to flood protection or water quality at the regional scale.



Citations

[1] Newater Deliverable 1.3.2 :Adaptive water management in transboundary contexts

[2] Newater Report Series No. 18 - Deliverable D 3.3.2 : Stakeholder report defining needs for research, tools and capacity building in the Elbe basin

[3] NeWater Report Series No. 17 - Deliverable D 3.3.1 - WP 3.3 Elbe Basin Baseline Assessment of the Elbe basin