NeWater

GUIDANCE, TRAINING AND DISSEMINATION PLAN
(G & T PLAN)

D.4.3.1

Report of the NeWater project -
New Approaches to Adaptive Water Management under Uncertainty
www.NeWater.info

Title:	Report on Guidance, Training and Dissemination Plan
Purpose:	Plan for dissemination, guidance and training for water management practitioners. To be tested in NeWater Case Study Basins.
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Executive Summary

The Guidance, Training and Dissemination Plan (the G&T-Plan), describes how the development of guidance and training material, in themes relevant to Adaptive Water Resources Management (AWRM), will be carried out and then tested.

The overall structure of the G&T-Plan is centered on the Integrated Water Resources Management (IWRM) cycle as proposed by the Global Water Partnership (GWP). However, this cycle has been modified to include the central elements of uncertainty.

Acknowledgment of uncertainty in the IWRM cycle renders IWRM adaptive since it implies carrying out water management in an iterative manner. Thus, IWRM becomes Adaptive Water Resources Management (AWRM). IWRM also becomes *adaptive* through continual improvement of management policies and practices through learning from outcomes of implemented management strategies. The difference between IWRM and AWRM is that AWRM takes account of uncertainty at each step in the IWRM process and recognizes explicitly that water management strategies and goals may have to be adapted during the management process.

NB: One should note that in this deliverable the IWRM cycle is used as an interim NeWater AWRM framework, anticipating the development of the NeWater AWRM framework.

The adaptive approach involves employment of management programs that are designed to experimentally compare selected policies or practices with alternative hypotheses about the water system. The adaptive capacity of the system results from an integrated system design. This design is based on increasing the ability of the system anticipate change rather than to react to undesirable impacts of that change.

This Guidance, Training and Dissemination Plan aims to provide a hand guide of training possibilities for the Case Study Stakeholders. The plan reflects different training steps that could take place within the cycle of AWRM to enhance the stakeholders' abilities to anticipate change at various points in the cycle.

This deliverable is made up of 5 sections, concerning the following:

Section 1: The 'Broker Concept' and the Definition of the target audience for the training;

Based on the *Broker-concept,* the G&T plan (as it is now) will be tested in interested NeWater Case Study Basins in order to receive feedback from these stakeholders for the final design of the G & T plan. WP4.3 will act as an intermediary between the Case Study stakeholders and the people who can provide the training that the stakeholders seek.

The target audience for training has been identified as the *water managers or practitioners working at the operational level*, normally within water management authorities within the river basins.

Section 2: Explanation of a modular, structured breakdown of the training material to be taught, called the *Building Blocks;*

The *Building Blocks* of the training material are based on the steps identified in the IWRM cycle. One block has been added in order to provide trainees with a general overview of AWRM. The blocks, which make up the *Interim NeWater AWRM Framework,* are:

Block 0:	Overview
Block 1:	Establish Status and Build Commitment to Reform
Block 2:	Analyse Gaps
Block 3:	Prepare Strategy
Block 4:	Implement Frameworks
Block 5:	Monitor and Evaluate Progress

Within each block, the training material has been divided into themes and for each theme contributing tools are to be described.

In the Guidance and Training Table (G&T-Table) Block-, Theme- and Tool-owners are indicated. This is done so that it is known who is responsible for a.) development of the tool, b.) packaging various tools into theme training and c.) who has the final responsibility of overseeing that themes within the blocks carry out design of the training material.

NB: The G &T-Table is explained in Section 2 can be found in Appendix I.

Section 3: A process plan for the development of the training material;

In order to develop the training material, the block-owner will specify the overall learning goals and training objectives for that block, fitting it within the AWRM cycle objectives. The theme-owners will then specify the learning goals for their themes, including tools in their themes to facilitate these goals.

Tool selection is both concept- and demand-driven and follow the 'broker concept'. Tools may be existing tools or tools that are yet to be developed in the NeWater Project. They are justified for inclusion based upon how well they support the theme- and block learning goals. Also, they are included according to tool demands of the case study (CS) stakeholders.

The tool demands, in turn, are based on:

i) Gaps Analysis for tools in the NeWater test cases in the State-of-the-Art report (D 4.2.1),
ii) Desk Study Review of current IWRM practices in NeWater river basin (D 4.1.1),
iii) D 4.2.2 report on specification for enhancing existing tools, and finally
iv) Research Action Plans (RAPs) and
v) Feedback from the case studies

Section 4: Specification of the learning goals, activities, themes and tools to be taught (the so-called "training frameworks") in the different cycle steps

Tool and theme-owners together are responsible for making the tool suitable for demonstration and/or training. In practice, this will require cooperation between theme-owners in WP 4.3 and tool-enhancers in WP 4.2. The training options will be offered to the CSs. According to the feedback from the CSs the demand of training needed and possible gaps are identified. These demands and gaps will be forwarded to the responsible persons within WP 4.3, WP 4.2 and the tool developer. The 'training and dissemination plan' will be adjusted according to case study requests –

if time, budget and training personnel allows. Once the training material has been produced according to each theme, each theme-owner will send it to the block-owners. It is the task of the block-owner to edit the material according to the block learning goals and training objectives and to send the final material to the NeWater Portal for inclusion in the on-line training packages. The training material will be delivered to the case studies and provided by WP4.3 as 'train the trainer' sessions. The case studies are responsible then to translate the produced training material into the respective language and conduct training for stakeholders. The trainers give feedback regarding the quality and usability of training material to WP4.3 which will evaluate feedback and revise training material together with WP4.2 and tool developers – if available.

Section 5: Implementation of the material in test training.

Testing of the G&T material will take place in two stages:

Stage 1 Pre-testing involving students, in order to test the scientific contents of the material;

Stage 2 Testing with target groups in NeWater Case Studies via trainers to ensure that the material is suitable for water managers.

The test training program will be theme-based and modular. During testing, one or more themes will be packaged into modules. These modules will cover a number of aspects of the blocks described in this deliverable instead of each block specifically. This is due to time and resource restrictions. Also, the training material will not limit itself to focussing only on specific blocks, since these may change due to present development of the NeWater AWRM framework.

Depending on the testing situation and on the needs and demands of the testing targets groups, the training events can be planned to last a day or two or only fractions of a day. Trainees will be trained on principles and practices of AWRM as they indicate they feel they need. Part of the training will be hands-on use of tools, which will be supported by tutorial-style feedback.

The available resources will, for now, only enable test-training to take place during the course of the project. However, it is envisioned that the G & T material will be packaged so that is can be taught via e-learning (using the NeWater Portal) or through face-to-face tuition during a 10 month part-time course or via an MSc-level graduate course.

Comments received from various stakeholders in the NeWater Case Study Basins have indicated that the stakeholders are not necessarily keen to invest large amounts of time in training about the entire AWRM cycle. Instead, they have argued that they are interested in learning about the tools and techniques that can contribute to dealing with the issues at hand within the basins. Therefore we have adopted the aformentioned 'broker concept'.

This G&T-Plan takes these comments into account and stresses that the training material for the various blocks (steps of the AWRM cycle) can be fitted to the needs and wants of the Case Study Stakeholders. This does, however, require the Case Studies to make a selection of the:

1. Block-Themes on which they would like to focus;
2. Tool or tools which they consider most interesting and feasible for training.

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Introduction

1.1 Aim of deliverable

The deliverable D.4.3.1 describes the guidance, training and dissemination plan (G&T plan) for stakeholder-based educational activities within the NeWater framework for Adaptive Water Resources Management (AWRM).

The main focus of the deliverable is to outline the development of a holistic set of training materials to support the dissemination of ideas, concepts and tools necessary for the successful implementation of Adaptive Water Resources Management. The tools which have been selected to support the training are based on already existing tools; however, they may need enhancement before being able of support AWRM (this is done in WorkPackagen4.2). In due course, new tools will also be developed in the NeWater project that can be added in a coherent way to the present G&T plan at a later stage.

The G&T plan is based on tool and training needs collected from the NeWater Case Studies (CS). The provision of a large number of thematic courses relevant for implementation of AWRM-related activities gives the practitioners the opportunity to tailor training programs to their specific needs according to which stages within the AWRM cycle they are currently working in.

The G&T plan as presented in this report is to be tested in a number of selected WB3 case study basins and the outcomes of these tests and feedbacks will then subsequently be used for improvement and result in the final Dissemination, Guidance and Training plan (D.4.3.2).

1.2 The 'Broker Concept'

Case study leaders have asked to change the previously agreed system of testing training material for AWRM only in the Orange and the Rhine basins as decided at the NeWater General Assembly in 2005. As a result of this feedback on the first draft of the D4.3.1 'Training and Dissemination Plan' the 'broker concept' was discussed and was favoured by all sides.

In the 'broker concept', WP4.3 will act as a broker between the producer of training material, tool developer and case study needs – organising training material for all case studies according to the available time, budget and training personnel of all parties concerned (tool developers, WB4 partners, case studies etc.) as well as according to the basic AWRM concept.

This concept- and demand-driven approach shall assure that the training material produced is linked to the gaps and demands within the case studies.

1.3 Target audience of this deliverable

This deliverable has the function to communicate to the NeWater project the Plans which Work Package 4.3 has in order to structure, develop and test Guidance and Training material. The approach documented implies a sharing of responsibilities with other Work Packages (WPs) for the production of training material. It thereby gives details about which tools will be trained upon or used for training. The document serves as reference for the NeWater partners and especially for the groups of WP4.2, WP4.3, WP6.3 and WB3. NeWater partners have reviewed this document and informed WP4.3 of any missing tools or if there are any disagreements in role allocation.

1.4 Contents of this deliverable

The G&T plan has 5 main components. It includes the definition of the target audience for the training; a modular, structured breakdown of the training material to be taught, in the form of the "G&T table"; a process plan for the creation of the training material; a specification of the learning goals and activities to be taught (so-called "training frameworks") and ideas on how the material can be taught and tested.

In Section 2, the overall aims of the training program will be defined as will be the target audience for the training and the process that led to the identification of this audience. In Section 3 "Building blocks: The G&T table and a plan for the creation of the training material", the G&T table will be explained (along with a description of the interim NeWater AWRM framework underlying it) and the process for the creation of the training material will be outlined. In section 4, "Contents of the training material", the tools to be enhanced by WP4.2, which are included in G&T plan, are presented together with a description of the 2-phase process for including these and further tools in the G&T as the project progresses. In addition the learning goals and activities of each training block are identified.

Finally, Section 5, "Implementation of the test training" presents an outline of possible training programs using the material developed as well as an approach to the testing this material. The latter pays attention to the process of fine tuning the training to the target audience, starting with the test training in the case study areas.

The appendices provide fuller details of the main elements of the G&T Plan. Appendix I presents the G&T table whilst Appendix II presents the training frameworks for each of the themes.

1.5 Taking stakeholders comments into account

Comments received from various stakeholders in the NeWater Case Study Basins have indicated that the stakeholders are not necessarily keen to invest large amounts of time in training about the entire AWRM cycle. Instead, they have argued that they are interested in learning about the tools and techniques that can contribute to dealing with the issues at hand within the basins. Therefore we have adopted the aformentioned 'broker concept'.

This G&T-Plan takes these comments into account and stresses that the training material for the various blocks (steps of the AWRM cycle) can be fitted to the needs and wants of the Case Study Stakeholders. This does, however, require the Case Studies to make a selection of the:

1. Block-Themes on which they would like to focus;
2. Tool or tools which they consider most interesting and feasible for training.

2 Aims and Target Audience

2.1 Aims of Training

The main objective of the training is to disseminate the knowledge and experience collected and developed in NeWater and other research projects. The focus of the training will be on the concept of Adaptive Resource Water Management (AWRM), and the use of new promising tools and of enhanced existing tools to realize AWRM.

The eventual training will be held in the NeWater Case Study basins in order to support the on-going process in these basins towards AWRM. The available resources will, for now, only enable test-training to take place during the course of the project. However, the test-training will enable WP4.3 to gain feedback on the training material and valuable information for improvement on the content, methods, tools and implementation.

During the present development of the training material, the main goal will be to explain its use in AWRM, only in test-training will water managers of the basins be able get hands-on experience with use of the tools.

2.2 The 'Broker Concept'

Case study leaders have asked to change the previously agreed system of testing training material for AWRM only in the Orange and the Rhine basins as decided at the NeWater General Assembly in 2005. As a result of this feedback on the first draft of the D4.3.1 'Training and Dissemination Plan' the 'broker concept' was discussed and was favoured by all sides.

In the 'broker concept', WP4.3 will act as a broker between the producer of training material, tool developer and case study needs – organising training material for all case studies according to the available time, budget and training personnel of all parties concerned (tool developers, WB4 partners, case studies etc.) as well as according to the basic AWRM concept.

This concept- and demand-driven approach shall assure that the training material produced is linked to the gaps and demands within the case studies.

The different steps of the 'broker concept' are:

<u>Phase 1:</u>

1. WP4.3 will offer training options to the CSs
2. CSs will give feedback concerning there demand of training needed and identify possible gaps
3. these demands and gaps will be forwarded to the responsible persons within WP4.3, WP4.2 and the tool developer
4. the 'training and dissemination plan' will be adjusted according to case study requests – if time, budget and training personnel allows

This is being done currently.

<u>Phase 2:</u>

1. WP4.3 and WP4.2 will, together with tool developer, produce or enhance the training material needed
2. enhanced training material will be delivered to case studies
3. WP4.3 provides – if possible together with tool developer – 'train the trainer' sessions on the produced material for case study members (in English)
4. the case studies are responsible then to translate the produced training material into the respective language and conduct training for stakeholders
5. trainers give feedback regarding the quality and usability of training material to WP4.3
6. WP4.3 will evaluate feedback and revise training material together with WP4.2 and tool developers – if available

2.3 Target audience for training

In 2005, WP4.3 developed a plan for the identification of target groups for guidance and training (see document: "Plan for the identification of target groups for guidance and training in 4.3.1"), which was carried out between September 2005 and January 2006.

The first step was to collect the names and organisations of potential stakeholder trainees involved in water management within and outside the NeWater Case Studies. Information was collected from NeWater Deliverables, field contacts of members of WP4.3 and responses to advertisements for trainees at the General Assembly in 2005.

The following reports were available and were used to identify potential stakeholders for training:

- *D1.2.1: Report on a comparative analysis of governance structure in the NeWater basins* (draft versions of country reports)
- *D1.3.1: State-of-the-art report on the two transboundary aspects information and institutional resource regimes* (draft versions of country reports)
- *D4.2.1: State-of-the-art report with users' requirements for new IWRM tools*
- *Case study RAPS* for all case studies (various WB3 deliverables)

The identified potential trainees were then categorised according to their Case Study Basin and the type of organisation that they belonged to (see Table 1 and Table 2).

Table 1: Distribution of potential trainees and organisations between the case studies

Case Study Basin	**Number of Potential Trainees**
Rhine	63
Orange	60
AmuDarya	62
Elbe	44
Tisza	27
Nile	27
Guadiana	36
Unattached	33
TOTAL	**352**

Table 2: Categorisation of potential trainees and organisations according to organisation type

Type of organisation	**Number of Potential Trainees**
Water management authorities	98

Ministries	63
Water industry lobby groups	28
Academic Inst.	26
International commissions	18
Development agencies	15
Water User Associations	13
Private individuals	6
Utility companies	5
Civic groups	4
Other NGOs	30
Others	30

Based on Table 2, the WB4 partners at the WB4 Paris Meeting, February 2006, decided to concentrate the training on **water managers** or **practitioners working at the operational level**, normally found within water management authorities.

These people are the water professionals who are responsible for the functioning of the water management **at all levels**. They are involved in the day-to-day operation, decision-making, data collection, planning and design, and contacting water users and other stakeholders.

We target our training on this one group in order to keep the training resource-efficient and focussed. We also target them in order to reach those who are most directly related to the water management, which makes the training most efficient.

Other groups relevant in the process such as policy makers, land owners, researchers, and representatives of relevant sectors will be, where practicable, invited to provide input into the training by presenting their perspectives of the water management problem. An indirect target group are the students for which WP6.3 may select some relevant training material to use in their education. Synergies with WP6.3 will be gained by doing pre-testing of the WP4.3 material with students (see section 5).

3 Building Blocks

The structure of the first **Guidance and Training Table, G&T-Table,** is the cornerstone of Deliverable 4.3.1. The table has been developed to give an overview as to how training will be oriented towards a future NeWater AWRM framework. It also shows which tools have been selected for development and training. Furthermore, the table presents the internal organisation of the guidance and training plan, showing which WP4.3 institutions carry responsibilities to develop, package and disseminate the training material. Table 3 gives an example of the manner in which the G&T table has been set up. The complete table can be found in **Appendix I.**

3.1 G& T-Table components

The G&T-Table is based on:

- **NeWater AWRM framework:** the conceptual cycle describing the iterative stages of adaptive water resources management as proposed by the NeWater project.
- **NeWater Portal:** the embodiment of the AWRM framework in the form of a training portal for use by stakeholders.

The G&T-table is composed of:

- **Blocks:** representing the five stages of the AWRM-Cycle
- **Activities:** representing the activities that are carried out during each stage
- **Themes***:* curriculum that has to be taught to the practitioners in order to enable them to carry out the activities
- **Tools:** a method, tool or approach that can be used to support the execution of a thematic activity in the AWRM cycle. Tools that are to be pre-tested (in phase 1) may be existing and enhanced tools. Tools that are still to be developed within NeWater will be tested in phase 2 (see also section 5 concerning these test-phases).

Block 2: Analyse Gaps, Block Owner: Alterra

Activities:

- Gaps analysis
- Problem analysis
- Goal setting

Theme		**Tools**			
type	**owner**	**type**	**owner**	**Phase of tool (1^{st}/2^{nd})**	**Training Method**
Use of integrated assessment model	Alterra	- Scenarios analysis method	CESR	2^{nd} phase	- e-learning - workshop
		- Integrated modelling tool WaterGAP	GEUS	1^{st} phase	- workshop
Uncertainty assessment	USF	- VIC-model	WUR	2^{nd} phase	- workshop

Table 3: Example of the set-up of the G&T-Table

3.2 Introduction to the "owners" concept

For the purpose of developing the training material, all blocks, themes and tools have owners. They have the following tasks and responsibilities:

- **Block-owners:** specify the overall learning goals for the block and course objectives and make it consistent with the themes within that block. Attention is given mainly to development of dissemination material about theories, principles and practices, as well as to monitoring the development of the training material.
- **Theme-owners:** organise the creation of training material that will support the practitioners to carry out the AWRM-activity within the blocks. This includes selecting tools to facilitate the learning objectives within a theme.
- **Tool owner/enhancers:** together with the theme-owners, these are responsible for making the tool to be trained, fit for demonstration or training and to develop training material (i.e. with WP4.2).

3.3 The interim NeWater AWRM framework

The overall structure of the Guidance and Training Table is centered on the Integrated Water Resources Management (IWRM) cycle as proposed by the Global Water Partnership (GWP) (see Figure 1). However, this cycle has been modified to include the central elements of uncertainty.

Acknowledgment of uncertainty in the IWRM cycle renders IWRM *adaptive* since it implies carrying out water management in an iterative manner. Thus, IWRM becomes **Adaptive Water Resources Management (AWRM)**. IWRM also becomes *adaptive* through continual improvement of management policies and practices through learning from outcomes of implemented management strategies. The difference between IWRM and AWRM is that AWRM recognizes explicitly that water management strategies and goals may have to be adapted during the management process.

NB: One should note that in this deliverable the IWRM cycle is used as an interim NeWater AWRM framework, anticipating the development of the NeWater AWRM framework.

However, since water management is faced with much uncertainty about future developments, both short- and long- term water management strategies complex and difficult to formulate (Pahl-Wostl et al., in press). These developments include climate change but also developments in technology (data gathering and modelling) and in institutional and governance structures.

The adaptive approach involves employment of management strategies that are designed to experimentally compare selected policies or practices according to different hypotheses about the uncertainties in the system.

The *Building Blocks* of the training material which make up the *Interim NeWater AWRM Framework,* are based on the steps identified in the IWRM cycle. One block has been added in order to provide trainees with a general overview of AWRM. The blocks, which make up the *Interim NeWater AWRM Framework,* are:

Block 0: Overview
Block 1: Establish Status and Build Commitment to Reform
Block 2: Analyse Gaps
Block 3: Prepare Strategy

Block 4: Implement Frameworks
Block 5: Monitor and Evaluate Progress

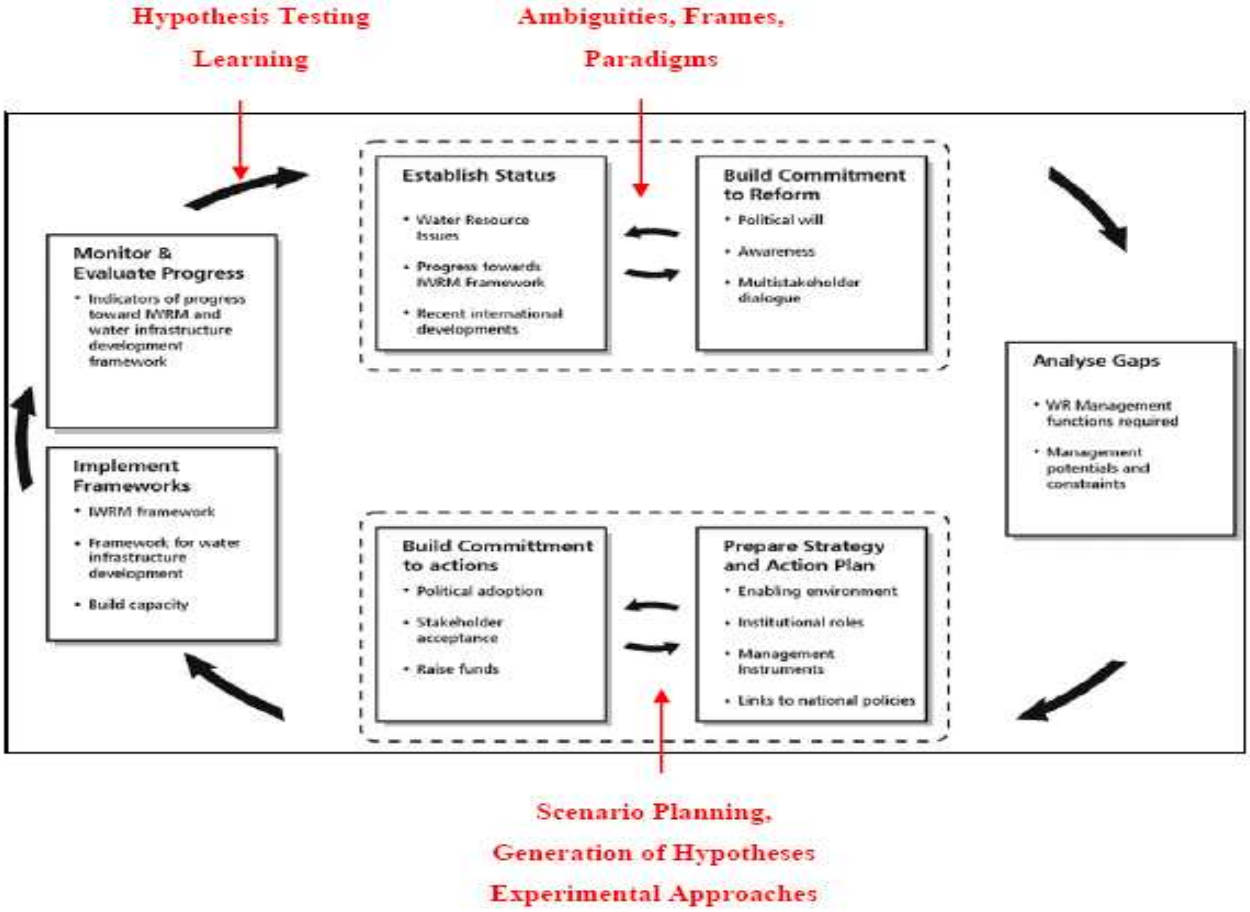

Figure 1: Different steps in the IWRM Cycle which is used for the interim NeWater AWRM framework.

4 Process Plan for development of the training material

The process for the development of the training material has been designed in such a manner to allow the efficient share of work between members of WB4. It supports the creation of a modular training program that is based both on the NeWater AWRM framework and the needs of the case studies (i.e. it is both concept- and demand-driven). The creation of the training material is an iterative and interactive process between WP4.3 and WP4.2 that will occur in two phases:

i) to develop training material on already **existing** and NeWater tools that may need **enhancement** and

ii) to develop training material on tools **developed later** by NeWater.

WP 4.2 therefore acts as an interface for WP4.3 to the rest of the project as well as to the case study stakeholders, providing direction on what tools should be trained upon and, through its **gaps-analysis** work, what the stakeholders require. The principles, practices and tools collected and developed through the NeWater project in Work Blocks 1, 2 and 3 will be identified and enhanced as tools for use in adaptive water resources management through WP 4.2.

4.1 Stages of development

The process for the development of the training material has been split into 7 stages, described below:

Stage 1:

The NeWater research team working on the NeWater AWRM framework (Work Block 1) identifies the building blocks of the AWRM framework cycle. Each block represents one critical step in the cycle.

As mentioned above, however, the training material developed in 4.3 is, at the moment, structured according to the stages in the IWRM cycle as proposed by GWP and includes the uncertainty element which renders IWRM, adaptive.

Stage 2:

Each block within the *Interim NeWater AWRM Framework* has a block-owner who is responsible for specifying the **block's overall learning goals** and **training objectives**. In doing so the block-owner will ensure that these fit the AWRM objectives. The responsibility of the block-owner will also be specify to the theme-owners what these goals and objectives are and to help identify how the theme-owner's work can assist in achieving these goals and objectives

Stage 3:

Based on the block goals and objectives, each theme-owner will develop **objectives** for their own **theme.** Then **tools** will be identified which can be used to support the theme and for which there is a need for training. Tools may be existing tools or tools to be developed in the NeWater Project. The theme-owner should review available tools for their purposes and include appropriate tools and/or justify the presence of tools already included in a theme on the background of

i) Gap Analysis for tools in the NeWater test cases in the State-of-the-Art report (D.4.2.1),

ii) Desk Study Review of current IWRM practices in NeWater river basin (D.4.1.1),

iii) D.4.2.2 report on specification for enhancing existing tools, and finally

iv) Case Study Research Action Plans (RAPs).

The **theme-owner** creates a **training framework** for the theme and, based on this framework, provides the tool owner or enhancer (WP4.2) with specific requests for training material on their tool. WP 4.2 is thus also the atelier where theme- and tool-owners will work with tool-enhancers to enhance the tools according to theme goals and objectives. Also, Work Block 5 and Work Package 6.3 will be able to give inputs through dissemination and feedback mechanisms.

Stage 4:

Based on the training framework and discussions with the theme-owner, the **case studies** will give **feedback** concerning there demand of training needed and identify possible gaps. These demands and gaps will be forwarded to the responsible persons within WP 4.3, WP 4.2 and the tool owner and/or enhancer will produce raw training material the 'training and dissemination plan' will be adjusted according to case study requests – if time, budget and training personnel allows.

Stage 5:

The collated material is then packaged by the theme owner according to the theme (i.e. writes an introduction to the material) and sent to the block-owner.

Stage 6:

The block-owner checks and coordinates with the theme-owner that the material is appropriate for the block, requesting changes if necessary and then collates the material from all themes within their block.

The training material will be delivered to the case studies and provided by
WP4.3 – if possible together with tool developer – as '**train the trainer**' sessions on the produced material for case study members (in **English**).
The case studies are responsible then to **translate** the produced training material into the respective language and conduct training for stakeholders. The trainers give **feedback** regarding the quality and usability of training material to WP4.3 which will **evaluate** feedback and revise training material together with WP4.2 and tool developers – if available.

Stage 7:

The training material will be **upgraded** after feedback from the test training (see Section 5 and other work blocks such as WB5, WB3) and sent up to the NeWater AWRM framework team who adds it to the NeWater **Portal**.

4.2 Status of development of the training material

Since NeWater AWRM framework has, at the moment, not been fully developed, WP4.3 uses the **Interim NeWater AWRM framework**. We are confident, however, that the training material as it has been grouped thematically at the moment, can easily be adapted into the new NeWater AWRM framework one it has been completed.

The creation of the Guidance and Training Table (see Appendix I) and the training frameworks (see Appendix II) is a result of having completed Stages 1-2 and having started on Stage 3. Communication with the tool owners/enhancers is in progress.

5 Contents of the training material

The **Building Blocks** of the training material are based on the steps identified in the IWRM cycle. One block has been added in order to provide trainees with a general overview of AWRM. The blocks, which make up the *Interim NeWater AWRM Framework*, are:

Block 0: Overview
Block 1: Establish Status and Build Commitment to Reform
Block 2: Analyse Gaps
Block 3: Prepare Strategy
Block 4: Implement Frameworks
Block 5: Monitor and Evaluate Progress

5.1 Activities and Learning Goals within each block

Within each block
The following tables describe the activities and learning goals for each Block.

Table 4: Activities and learning goals for Block 0

Block 0: Overview

Description of AWRM Activities	**Description of Learning Goals**
	- Why adaptive water resources management - Introduction to complex system thinking - Adaptive and integrated planning cycle - Difference of planning cycle to other planning approaches - Role of uncertainties in AWRM Types and sources of uncertainties

Table 5: Activities and learning goals for Block 1

Block 1: Establish Status / Build Commitment to Reform

Description of AWRM Activities	**Description of Learning Goals**
– Hydro physical System Identification – Water, Water quality & quantity – Poverty, gender & health issues – Resilience Capacity – Social System Identification – Building Commitment	The general goal of the block is to teach participants, through training, how to lay the foundation for transition to AWRM. This foundation is built up on an understanding of the water system, the interests of the other stakeholders involved, and the possible methods that are available to them in order to gain commitment, to collect data and to monitor progress. Therefore, the participants will acquire an overview of: - methods for planning, evaluating and implementing participation in order to build commitment to a planning process; - methods through which stakeholder and institutional analyses can be conducted. The participants will learn about the different interests of the various

	stakeholders and how a common ground between diverging parties can be found in order to realize an integrated solution. Thereby, insight will be given in the consequences of and reactions on changes in the water system. However, in order to keep track of possible changes in the system and of the progress of the transition to adaptive management, an overview will be given of a number of: - methods for collecting and monitoring data; - appropriate indicators to monitor progress towards predefined goals. Participants will also learn how to consider which methods or indicators could be appropriate for realizing adaptive management in a manner that is appropriate for their specific situation.

Table 6: Activities and learning goals for Block 2

Block 2: Anaylse Gaps

Description of AWRM Activities	Description of Learning Goals
– Gaps Analysis – Problem Analysis – Goal Setting – Constraints Setting	To identify the gaps of tools being ' concepts, models or methods' needed for: - problem formulation, data collection and analysis - scenario development, goals formulation and identification of constraints - integrated assessment - social learning, participatory and interactive processes

Table 7: Activities and learning goals for Block 3

Block 3: Prepare Strategy and Action Plan / Build commitment to Actions

Description of AWRM Activities	Description of Learning Goals
– Integrated model assessment – Assessment of Measures: Hydro, Social, Economic – Fund Raising – Political / Stakeholder Acceptance / Adoption	– how to prepare strategies and action plans at the river basin scale – how to assess the trade-off between different (hydraulic, social, economic political) measures, – how to address uncertainty in the decision making process – how to increase stakeholders involvement in the decision making process – how to increase adaptive capacity in integrated water management.

Table 8: Activities and learning goals for Block 4

Block 4: Implement Frameworks

Description of AWRM Activities	Description of Learning Goals
	– Knowledge and understanding on how to implement strategies at the river basin scale – Knowledge and understanding on how to implement strategies so that they are flexible enough to be revised or altered as a result of the monitoring and evaluation carried out after implementation – Knowledge and understanding on how to implement strategies as part of an experimental 'learning by doing'-approach – Knowledge and understanding on building up implementation capacity in terms of: – local know-how for implementation – influencing legislation getting funding and exploiting synergetic effects of multiple funding options

Table 9: Activities and learning goals for Block 5
Block 5: Monitor and Evaluate Progress

Description of AWRM Activities	Description of Learning Goals
– Monitoring of Processes, – Evaluation of Progress	How to monitor and evaluate the effect of measures in an iterative fashion within an adaptive water management framework

5.2 Selection of tools within the themes

The main aim of WP 4.3 is the dissemination of the products developed by NeWater, however already existing tools will be enhanced by WP 4.2 to serve the purpose of being used in AWRM. The tools selected for enhancement (see Table 10) have been the first to be included in the training; their selection is described in (D 4.2.2) and involved discussions with the case studies. In addition, other tools have been included since they are available and appropriate for use within the AWRM cycle training.

Information on the tools that have, so far, been selected for training can be found in Table 11 through Table 16. These tables indicate the tools' potential application in adaptive water management and the demand for such a tool from the Case Study basins.

NB: Please note that, not all tools are mentioned in these tables. For a full list of tools to be considered, see Appendix I, G&T- Table.

Table 10: Tools selected for fast-track enhancement and delivered by December 2006 (Source: D.4.2.2)

No	Tool	Partner	PM	Test basin	Enhancement
1	Bayesian Network for participatory modelling	GEUS	2,5	Guadiana or Rhine or Orange	Documentation and ex-post assessment of the Zealand case
2	UN-GWP Handbook	CRAN	0,5	Orange and Rhine	Integration of various learning styles and preferences in a new interpretation and delivery of the handbook
3	Enhanced Stakeholder-Issue Analysis	TU-DELFT		Tisza or Guadiana or Amudarya	Adjustment to adaptive management
4	Evolutionary multiobjective optimisation	UNEXE	1,5	Guadiana and another basin	Generate management scenarios, explore the trade off and address uncertainty
5	Adaptive Monitoring Design Support System	IRSA	2	Tisza and Amudarya	Information needs elicitation to take into account the continuous changes
6	Guidelines for DSS	FEEM	3	Tisza	Key success factors for implementation and development of DSS
7	Waterwise model	ALTERRA	1	Rhine	Transferability and documentation

Table 11: Tools for Block 0: Overview – Adaptive and Integrated Planning Cycle

Theme name	Tool	Use of tool / Description	Need of tool in Case Study areas

a) Adaptive and Integrated Planning Cycle	Updated GWP Handbook	The updated book, which previously only focussed on IWRM, will include a supplement outlining additional AM concepts. Also, instructions for running a social simulation or social learning exercise based on these concepts will be provided.	In all case studies a general overview to AWRM is sought after.

Table 12: Tools for Block 1: Establish Status / Build Commitment to Reform

Theme name	**Tool**	**Use of tool / Description**	**Need of tool in Case Study areas**
a) Monitoring Data Collection	AMIS/MoST	Describe the importance of monitoring, indicate which aspects should be monitored and develop a monitoring plan using e.g. AMIS and/or MoST	In 6 of the 7 case study areas (Rhine, Elbe, Tisza, AmuDarya, Orange and Nile) the need for tools for information management has been indicated (D.4.2.2)
b) Indicator Development	Water Poverty Index		
c) Dealing with multiple actors, ambiguous issues and diverging frames	Multi-actor behavioural simulations	This tool allows to learn in an experience-based way about multiparty collaboration, diverging problem definitions, dealing with different interests, negotiation and conflict management.	There is a demand for educational tools indicated in the State of the Art Report (D.4.2.1), although the content of education was not specified. We believe that experience-based learning is an effective way to change behaviour.
	Multiparty collaboration model HarmoniCOP model for participation and social learning	Knowledge about steps in the unfolding of a collaboration process and on specific issues that need to be adressed, can be transmitted in short introductory seminars. Information on different levels of participation and reflection on the current and local state with regard to participation can put them on their way to more collaboration.	In the river basins of Elbe and Guadiana lack of stakeholder involvement is reported in the Desk study review (D 4.1.1). People there are looking for a strategy towards more stakeholder involvement. Also in the Rhine basin the need for combined efforts of governments and NGO's is expressed to achieve a sustainable water system.
d) Stakeholder and Institutional Analysis	Enhanced Stakeholder and issue analysis	The purpose of the enhanced stakeholder-issue analysis tool is to show in what manner the water system influences and is influenced by the network of stakeholders. To understand this, the stakeholders thus need to learn about the network within which they find themselves and how the goals, interests and aims of the various stakeholders show the pluriformity, mutual dependency, closedness and the dynamics of the stakeholder network structure.	In all case studies, participatory methods is sought after.
e) Develop stakeholder commitment	Group Model Building / Cognitive mapping	Builds up group commitment to problem solving as well as providing a means of eliciting social, economic and physical system knowledge from stakeholders and sharing information between them. It is also a participatory modelling technique.	In all case studies, participatory modelling is sought after. Additionally, all are interested in improved methods of information sharing and integrating social, economic and physical knowledge. Tisza, AmuDarya, Rhine and Elbe seek methods of bringing in NGOs and other stakeholders into better transboundary cooperation – this tool provides a means of getting varied stakeholders engaging on a problem together (D 4.2.2).
	Group moderation and conflict resolution	Provides a facilitator with skills for working with groups of public or stakeholders in an efficient and effective manner. Conflicts can also be identified and resolved.	All case studies would like more engagement with stakeholders and public and Tisza particularly needs support in conflict resolution (D 4.2.2).

Theme name	Tool	Use of tool / Description	Need of tool in Case Study areas
a) Monitoring Data Collection	AMIS/MoST	Describe the importance of monitoring, indicate which aspects should be monitored and develop a monitoring plan using e.g. AMIS and/or MoST	In 6 of the 7 case study areas (Rhine, Elbe, Tisza, AmuDarya, Orange and Nile) the need for tools for information management has been indicated (D.4.2.2)
b) Indicator Development	Water Poverty Index		
	Multi-actor behavioural simulations	This tool allows to learn in an experience-based way about multiparty collaboration, diverging problem definitions, dealing with different interests, negotiation and conflict management.	There is a demand for educational tools indicated in the State of the Art Report (D.4.2.1), although the content of education was not specified. We believe that experience-based learning is an effective way to change behaviour.
	Multiparty collaboration model		
	Large group response exercises	A technique that elicits knowledge from medium-sized groups of the public to inform policy making. Can be used to share information between public and stakeholders.	All case studies would like more engagement with stakeholders and public and Tisza, Elbe and Nile particularly need more public involvement in policy making (D 4.2.2). Additionally, all but Guadiana, are interested in improved methods of information sharing.
	Public involvement campaigns	Techniques that allow the large sections of the public, en-masse, to get involved directly in providing inputs into planning or involved in the implementation of plans.	All case studies would like more engagement with public and the Tisza, Elbe and Nile particularly need more public involvement in policy making (D 4.2.2).
	Water calculator	A web-based tool for allowing members of the public to learn about and assess their own water use.	Guadiana, Tisza, Amudarya and Nile all request support for public awareness raising about water issues. Guadiana seeks web-based support (D 4.2.2).

Table 13: Tools for Block 2: Analyse Gaps

Theme name	Tool	Use of tool / Description	Need of tool in Case Study areas
a) Use of integrated assessment models	Scenario analysis, Integrated modelling e.g WaterGAP, Waterwise, Mulino, Analysis of climate change (WP2.2)	A scenario analysis is used to describe the possible options in a (future) situation. An integrated model can be used to quantify the possible changes, predict extremes, estimate costs of different options. As such the scenario analysis assists in making (policy) decisions.	All case studies identify the need to develop and implement policies for water management of a more integrative and sustainable kind. Also they identify the need to estimate future uncertainties and their incorporation into the planning policies, and the need to deal with extreme events (a.o. prediction) (D.4.2.2 – table 1, point 1, 6, and 7). Tools for assessment of scenarios of climate change requested in Tisza-, Nile- and Rhine basin
	Evolutionary multiobjective Optimisation	GenetXL provides optimum trade-off between multiple conflicting management goals which should be considered simultaneously. It provides a set of non-dominated management scenarios; and addresses uncertainty in decision making process.	All case studies identify the need to develop and implement policies for water management of a more integrative and sustainable kind. Also they identify the need to estimate future uncertainties and their incorporation into the planning policies, and the need to deal with extreme events (a.o. prediction) (D.4.2.2 – table 1, point 1, 6, and 7).

b) Participatory Integrated Assessment	Bayesian Network Analysis	A participatory modelling technique for getting groups of stakeholders to identify and analyse the impacts of uncertainties, problems and their solutions. Integrates social, economic and physical knowledge and data.	In all case studies, participatory modelling is sought after. Additionally, all are interested in improved methods of information sharing and integrating social, economic and physical knowledge. Tisza, AmuDarya, Rhine and Elbe seek methods of bringing in NGOs and other stakeholders into better transboundary cooperation – this tool provides a means of getting varied stakeholders engaging on a problem together. All but Guadiana and the Orange require support in the estimation of future uncertainties. This will be an enhanced tool. (D 4.2.2).
	Envisioning exercises	Allows stakeholders to consider uncertainties in terms of multiple future scenarios and to discuss and predict what could happen and how they would react (without the need for computer-based tools). Elicits knowledge about stakeholder attitudes to uncertainties and the future management system.	Orange in particular seeks tools to allow it to engage the public and stakeholders in assessing future scenarios. All but the Orange require support in the estimation of future uncertainties (D 4.2.2).
	Citizens' juries	Allows small sections of the public to take part in assessing their own management system in the form of juries listening to and judging expert views on problems and solutions. Elicits knowledge about public concerns about problems and their solutions.	Tisza, particularly, request support to encourage public policy dialogues. All case studies would like more engagement with stakeholders and public and Tisza, Elbe and Nile particularly need more public involvement in policy making (D 4.2.2).

Table 14: Tools for Block 3: Prepare Strategy and Action Plan / Build Commitment to Actions

Theme name	**Tool**	**Use of tool / Description**	**Need of tool in Case Study areas**
a) Use Integrated Assessment	Waterwise	Waterwise is a programming model that can be used for land and water use planning. It covers regional hydrologic interactions, effects of land use on water quality, on agriculture and on nature.	For water quality management Waterwise is needed in all case study areas. For the analysis of real-time data in all but Guadiana. (D.4.2.2-table 1)
	Evolutionary multiobjective Optimisation	GenetXL provides optimum trade-off between multiple conflicting management goals which should be considered simultaneously. It provides a set of non-dominated management scenarios; and addresses uncertainty in decision making process.	All case studies identify the need to develop and implement policies for water management of a more integrative and sustainable kind. Also they identify the need to estimate future uncertainties and their incorporation into the planning policies, and the need to deal with extreme events (a.o. prediction) (D.4.2.2 – table 1, point 1, 6, and 7).
b) Participatory Integrated Assessment	Splash!	Splash is a computer game where trainees learn that each intervention in land and water management ask for additional and supportive actions. Unexpected interventiones force to adapt their strategies.	In 4 of the 6 case studies there is a need for training and public awareness in aspects of inter-relations and uncertainties in AWRM (D.4.2.2-table 1)
	AquaDelphos (Multi-criteria Assessment)	Allows stakeholders to assess different strategies according to social, economic and physical criteria under conditions of uncertainty.	All are interested in improved methods of information sharing and integrating social, economic and physical knowledge. Tisza, AmuDarya, Rhine and Elbe seek methods of bringing in NGOs and other stakeholders into better transboundary cooperation – this tool provides a means of getting varied stakeholders engaging on a problem together. All but the Orange require support in the estimation of future uncertainties. (D 4.2.2).

	Role Playing Games	Allows a small group of stakeholders to assess and try out policy in terms of their own or others stakeholders' perspectives and to act out their or others' virtual responses to the policy.	Tisza, AmuDarya, Rhine and Elbe seek methods of bringing in NGOs and other stakeholders into better transboundary cooperation – this tool provides a means of getting varied stakeholders engaging on a problem together. All but Guadiana and the Orange require support in the estimation of future uncertainties (D 4.2.2).
	Public consultation	Another method of eliciting public responses to strategies from large sections of the public.	All case studies would like more engagement with stakeholders and public and Tisza, Elbe and Nile particularly need more public involvement in policy making. Tisza, particularly, request support to encourage public policy dialogues (D 4.2.2).

Table 15: Tools for Block 4: Implement Frameworks

Theme name	Tool	Use of tool / Description	Need of tool in Case Study areas
a) Adaptive Flexible Implementation Strategies	Agile Project Management Training	Training on how to do project management while taking into account uncertainty, unpredictability, multiple stakeholders and feedback.	In all case study areas there is a need for implementing AWRM policies: institutions for data management, legislation , conflict management and finances.
b) Building Implementation Capacity	ICIW	In ICIW the trainees become aware of the links between functions in water management tasks in an institutional setting and apply this in strategies for implementation of adaptive water management	In all case study areas there is a need for implementing AWRM policies: institutions for data management, legislation , conflict management and finances.

Table 16: Tools for Block 5: Monitor and Evaluate Progress

Theme name	Tool	Use of tool / Description	Need of tool in Case Study areas
Monitoring of process	AMIS/MoST	Describe the importance of monitoring, indicate which aspects should be monitored and develop a monitoring plan using e.g. AMIS and/or MoST	In 6 of the 7 case study areas (Rhine, Elbe, Tisza, AmuDarya, Orange and Nile) the need for tools for information management has been indicated (D.4.2.2)
Participatory evaluation	Social learning and participatory evaluation tools	Allows the involvement of stakeholders and public in assessing and monitoring the planning process.	All case studies would like more engagement with stakeholders and public and Tisza, Elbe and Nile particularly need more public involvement in policy making. (D 4.2.2)

It can be concluded that there are tools available for all steps in the AWRM cycle. Some of them are available already and will be enhanced through WP 4.2 if possible before the test training in the NeWater Case Study basins, whereas other tools are 2nd phase tools and are being developed through NeWater in Work Blocks 1 (concepts) and Work Block 2 (models). There are also some tools useful for application and training of AWRM, but which have not yet been included in the enhancement programme (WP4.2).

5.3 Training frameworks of themes

A block is composed of several themes which are specific for the AWRM cycle. For each theme, a **training framework** has been developed with specific tools and learning objectives in mind, which are reflected in the training frameworks for those themes (see **Appendix II**). The training frameworks act as the specifications for the creation of the training material. They give a systematic description of the learning goals per theme and describe the tools to be taught, the teaching methods and the approximate length of the teaching course.

The themes mentioned within the AWRM block have a general validity since they are collectively needed in order to cover all issues relevant in the phase of the AWRM cycle. It has been realized

that some of the target groups may have already mastered the aspects with a theme, but not within a block. Training material and the training programme can be adjusted accordingly.

6 Implementation of the test training

Comments received from various stakeholders in the NeWater Case Study Basins have indicated that the stakeholders are not necessarily keen to invest large amounts of time in training about the entire AWRM cycle. Instead, they have argued that they are interested in learning about the tools and techniques that can contribute to dealing with the issues at hand within the basins. Therefore we have adopted the aformentioned 'broker concept'.

This training guide takes these comments into account.

6.1 Potential Final Training Programme

The **main goal** of developing the training material is that the **material can and will be used after the end of the project**. Therefore, the project partners need to design a training program that is self-explanatory and accessible for everybody who wants to teach or learn about AWRM.

The main goal of the training to explain the use and application of the tools in AWRM, and not necessarily to enable the managers to implement the tools immediately. However, follow-up support on the use of particular tools would remain under the guidance of the regional NeWater Case Study teams.

Because of limited resources the WP 4.3 partners cannot carry out the training beyond testing it.

1. *Principal focus*

This means that the principal focus of the WP 4.3 partners needs to be on the:

- Generation of the training material;
- Testing of this material ;
- Revision of the generated material and
- Dissemination of the first version of training and guidance material due in Month 25 (deliverable D4.3.2).

2. *Dissemination*

The outcome of this work, training material, will then be provided to interested practitioners or trainers water management toolboxes and E-learning websites via:

a) The NeWater **Portal**
b) A **workshop** held **in every case study** in which the Portal and its use will be introduced to the stakeholders.

The workshops should also include involvement of tool owners or enhancers where possible.

3. *A post-project vision*

A potential final training program would have the trainees following through the AWRM Cycle and learning about at least one theme from each block in the cycle containing relevant concepts and tools from NeWater.

The training could either occur via:

- **e-learning** (via the NeWater Portal, with sufficient additional resources to creating the e-learning environment);
- a **training course** 10 month long part-time course;

- an **academic course** at MSc level.

The training course would involve workshops, ideally be given by trainers in collaboration with tool developers or enhancers, held over a period of approximately a year. This could indeed be done in synchrony with a live implementation of an AWRM cycle. Every two months, the trainees would meet for 2-3 days to learn about a new block in the cycle. Between meetings, the trainees should get project work to practise what they have learned and to transfer it into their everyday work. If implemented as on-the-job training – parallel to the developments in the basin- the training can be extended over the whole of one AWRM cycle.

6.2 The Testing Programme

The test training gives the WP 4.3 group the opportunity of gaining feedback and valuable information for the improvement of the content, methods, tools and training so that the training can meet the needs of the target audience: the water managers. The full plan for testing the training material will be elaborated upon in a forthcoming document. For now, a short sketch of the likely process will be presented here.

Test Training will involve the organisation of a special one-off test training program, since

a) not all training material will be completed (due to not yet developed tools),

b) testing will have to take place in a **short period of time**,

c) it is unlikely that the same group of trainees can be used to test the whole final program described above and

d) that the AWRM framework, and therefore blocks, will **change**.

The test training program will therefore be:

1) **Thematic** – it will be based on the themes rather than the blocks or tools alone. The overview module assures that trainee also understand the general idea of AWRM cycle;

2) **Modular** - different training themes will be packaged into self-contained training units (modules) which can be taught to different groups of trainees, by different trainers in different places. Modules will generally consist of themes that go together and that can be taught by a minimal number of trainers;

3) **Concept- and demand-driven** – the demands of the case studies will be taken into account as part of the broker concept. However, for reasons of limited resources and capacities, the test training in the case studies cannot be fully demand-driven. Decisions about which themes will be taught in a module will depend on which material and tools are ready; AWRM and which themes case studies would like to be taught on;

4) **AWRM-centred** - each module will begin with an overview of the concepts of AWRM and then follow on with training on the themes;

5) **Training-the-trainers-centred** – the training will be carried out in the case studies for trainers who will then be able to disseminate the material themselves to the target audience;

6) **English-language based** – the material will be written in English. It is up to the case studies to adapt the material to their own specific language needs;

7) **Evaluated** - each module will end with an evaluation of the course from the trainers and the trainee. The evaluation will be based on a standardised evaluation and feedback protocol.

The **methods** of training are very much inter-linked with the characteristics of the target group of training and the actuality of the site and period the training is given. The **duration** of training depends on the level of mastery at the start. Sometimes, an assignment is given related to the work the trainees come back afterwards for sharing their experience and make conclusions. As the assignment has a relation with their office work the timing and durations of this period may be flexible. In this way, modules for implementation of the training can be designed, adjusted to target group and conditions (site, phase of development, funding…).

If modules are trained on different groups, this can be done **parallel** to each other. It is however important to have a common start and end of the training so as to save costs (each gets trained together on the overview module) and to increase exchange of experiences (network functions) and information (evaluation).

1. *Who does the training?*

Training in the test training program will be done by:

a) the **tool owner/enhancer**, if the tool demands expert knowledge and cannot be taught by a third party;

b) a **member of WP 4.3**, if the tool is suitable to be taught by a third party.

Seecon will coordinate the testing program.

2. *Who prepares the material?*

The **preparation** of the **training material** for the test training needs to be the shared responsibility of WP 4.2 and WP 4.3, as described in Section 3.

3. *How long is the training programme?*

Each training module can last **a day, or two**, or parts of the day. This depends on the identified needs of the Case Study Stakeholders. It is also possible that there will be time for project work to be carried out between two training sessions.

4. *Who will be test trained?*

Based on the Broker Concept, the test training program will be provided in English as **'train the trainer'** sessions in the NeWater Case Study Basins where stakeholders have identified a specific demand for testing, guidance and training. The case studies are responsible then to translate the produced training material into the respective language and conduct training for stakeholders.

All training will be available through the NeWater Website and structured in the NeWater web-based **Portal**, which is still to be developed.

5. *Pre-test*

Before training takes place with the stakeholders, there will be the opportunity for some modules to be **pre-tested** with NeWater **students**, to support WP 6.3 student dissemination and training tasks.

The pre-testing will be done to test the scientific content of the course material and not the manner of its teaching. This will be determined according to testing done with the target audience in the main test phase.

References

Pahl-Wostl, C., Downing, T., Kabat, P., Magnuszewski, P., Meigh, J., Schlueter, M., Sendzimir, J. and Werners, S. (in press 2006). Transition to Adaptive Water Management; The NeWater project. Water Policy.

Appendix I

Training & Guidance Table - Connecting adaptive water resources management cycle to tools in water management

Block 0: Overview – Adaptive and Integrated Planning Cycle

Activities in AWRM block:

Introduction to Adaptive and Integrated Planning cycle
Dissemination support

Block owner: USF

Theme		Tools					
type	**owner**	**type**	**owner**	**Tool Phase ($1^{st}/2^{nd}$)**	**Training Method**	**Description**	**Background Information**
Adaptive and and Integrated Planning Cycle	USF	Mulino	FEEM	1	e-learning		
		MoST	WUR/GEUS	1	e-learning	Describes the importance of monitoring, indicates which aspects should be monitored and develops a monitoring plan using.	
		Management and Transition Framework / NeWater Portal	USF	2	e-learning		
		Uncertainty Tools	USF	2			
		Transition management	ICIS	2			

		GWP	CRAN			The updated book, which previously only focussed on IWRM, will include a supplement outlining additional AM concepts. Also, instructions for running a social simulation or social learning exercise based on these concepts will be provided.	
Software learning support	UNEXE	WINK	UNEXE	1	e-learning		
		Web based learning	IRSA	1	e-learning/ workshop		

Block 1: Establish Status / Build Commitment to Reform

Activities in AWRM block:
Hydro-physical system identification (e.g. status of water, Water Quality & Quantity)
Poverty, gender & health issues

Block owner: TU-Delft / RBA

Theme		Tools					
type	**owner**	**type**	**owner**	**Tool Phase ($1^{st}/2^{nd}$)**	**Training Method**	**Description**	**Background Information**
Monitoring / data collection	Alterra	AMIS	IRSA	2	workshop	Describes the importance of monitoring, indicates which aspects should be monitored and develops a monitoring plan using.	
		MoST	WUR/ GEUS	1	workshop	Describes the importance of monitoring, indicates which aspects should be monitored and develops a monitoring plan using.	
Indicator development	GEUS	Water Poverty Index	CEH	1	e-learning		
		WB2	WB2	2			
Vulnerability assessment	?	?		2			

Dealing with multiple actors, ambiguous issues and diverging frames	COPP	Multi-actor behavioural simulation	COPP	1	workshop	This tool allows to learn in an experience-based way about multiparty collaboration, diverging problem definitions, dealing with different interests, negotiation and conflict management.	
		Multiparty collaboration model	COPP	1	short seminar	Knowledge about steps in the unfolding of a collaboration process and on specific issues that need to be addressed, can be transmitted in short introductory seminars. Information on different levels of participation and reflection on the current and local state with regard to participation can put them on their way to more collaboration.	www.harmonicop.info
		HarmoniCOP Model for participation and social learning	COPP	1	workshop		
		Revised multi-actor behavioural simulation	COPP	2	workshop		
		enhanced Multi-actor behavioural simulation	COPP	2	workshop		
Stakeholder and institutional analysis	TU Delft / RBA	Enhanced stakeholder issue analysis	TU Delft / RBA	1	role play, group discussion, individual / group reflection, rope exercise	The purpose of the enhanced stakeholder-issue analysis tool is to show in what manner the water system influences and is influenced by the network of stakeholders. To understand this, the stakeholders thus need to learn about the network within which they find themselves and how the goals, interests and aims of the various stakeholders show the pluriformity, mutual dependency, closedness and the dynamics of the stakeholder network structure.	
		DANA	USF		seminar, hands-on tool workshop		www.dana.tudelft.nl/

Development stakeholder commitment	Seecon	Group model building / cognitive mapping	public domain	1	workshop	Builds up group commitment to problem solving as well as providing a means of eliciting social, economic and physical system knowledge from stakeholders and sharing information between them. It is also a participatory modelling technique.	Vennix, J.A.M. (1996), Group Model Building, Chichester, Wiley
		group moderation and conflict resolution	public domain	1	workshop	Provides a facilitator with skills for working with groups of public or stakeholders in an efficient and effective manner. Conflicts can also be identified and resolved.	Edmüller,A. & Wilhelm, T. (2002) Moderation. Haufe Verlag, Freiburg. (in German)
		Large group response exercise	public domain	1	workshop	A technique that elicits knowledge from medium-sized groups of the public to inform policy making. Can be used to share information between public and stakeholders.	
		public involvement campaigns	public domain	1	workshop	Techniques that allow the large sections of the public, en-masse, to get involved directly in providing inputs into planning or involved in the implementation of plans.	Wates, N. (2002) The community planning handbook. How people can shape their cities, towns and villages in any part of the world. Earthscan Publications Ltd, London.
		Water Calculator (Wasserrechner)	Armadillo.com	1	e-learning or in focus groups	Helps the user (members of the general public) to calculate their everyday water use and therefore can build up their commitment to changing their water use behaviour	http://www.armadillo-media.ch/wr/index.html (in German)
		Social learning HarmoniCOP Handbook	USF	1	workshop	Knowledge about steps in the unfolding of a collaboration process and on specific issues that need to be addressed, can be transmitted in short introductory seminars. Information on different levels of participation and reflection on the current and local state with	www.harmonicop.info

				regard to participation can put them on their way to more collaboration.	

Block 2: Analyse Gaps

Activities in AWRM block:
Gaps Analysis, Problem Analysis
Goal Setting, Constraints settings

Block owner: Alterra

Theme		Tools					
type	**owner**	**type**	**owner**	**Tool Phase ($1^{st}/2^{nd}$)**	**Training Method**	**Description**	**Background Information**
Use of Integrated assessment (models)	Alterra	Scenarios analysis method and Integrated modelling tool WaterGAP, Analysis of Climate Change (WP 2.2)	CESR Kassel	2	e-learning/ workshop	A scenario analysis is used to describe the possible options in a (future) situation. An integrated model can be used to quantify the possible changes, predict extremes, estimate costs of different options. As such the scenario analysis assists in making (policy) decisions.	http://grdc.bafg.de/servlet/is/1890/ www.usf.uni-kassel.de/usf/aktuell/forum.en/text2.htm
		Evolutionary multiobjective Optimisation	UNEXE		e-learning	GenetXL provides optimum trade-off between multiple conflicting management goals which should be considered simultaneously. It provides a set of non-dominated management scenarios; and addresses uncertainty in decision making process.	
		WEAP 21					www.weap21.org
		Guidelines DSS					
PP Integrated Assessment (Gaps Analysis)	Seecon	Participatory modelling with Bayesian Network Analysis	GEUS	1	workshop	A participatory modelling technique for getting groups of stakeholders to identify and analyse the impacts of uncertainties, problems and their solutions. Integrates social, economic and physical knowledge and data.	www.cs.ubc.ca/~murphyk/Bayes/bnintro.html
		MCA-AquaDelphos	USF	1	workshop	Allows stakeholders to assess different strategies according to social, economic and	

					physical criteria under conditions of uncertainty.	
	Group model building	public domain	1	workshop	Builds up group commitment to problem solving as well as providing a means of eliciting social, economic and physical system knowledge from stakeholders and sharing information between them. It is also a participatory modelling technique.	Vennix, J.A.M. (1996), Group Model Building, Chichester, Wiley.
	Envisioning exercises	public domain	1	workshop		
	Role playing game	public domain	1	workshop		
	citizen's juries	public domain	1	workshop		
	Public consultation	public domain	1	workshop		
	Social learning HarmoniCOP Handbook	USF	1	workshop	Knowledge about steps in the unfolding of a collaboration process and on specific issues that need to be addressed, can be transmitted in short introductory seminars. Information on different levels of participation and reflection on the current and local state with regard to participation can put them on their way to more collaboration.	www.harmonicop.info
Uncertainty assessment	USF VIC-model	WUR	2	workshop		

Block 3: Prepare Strategy and Action Plan / Build commitment to Actions

Activities in AWRM block:
Integrated model assessment
Assessment of Measures: Hydro / Social / Economic
Fund Raising
Political / Stakeholder Acceptance / Adoption

Block owner: UNEXE

Theme		Tools					
type	**owner**	**type**	**owner**	**Tool Phase ($1^{st}/2^{nd}$)**	**Training Method**	**Description**	**Background Information**
Use of Integrated assessment (models)	UNEXE	Waterwise	Alterra	2	e-learning / workshop		
		Evolutionary Multiobjective Optimisation	UNEXE	1	e-learning	GenetXL provides optimum trade-off between multiple conflicting management goals which should be considered simultaneously. It provides a set of non-dominated management scenarios; and addresses uncertainty in decision making process.	
Participatory Integrated Assesment (Strategy testing)	Seecon	MoST	WUR / GEUS	1	e-learning	Describes the importance of monitoring, indicates which aspects should be monitored and develops a monitoring plan using.	
		Splash!	Alterra	1	workshop	Splash is a computer game where trainees learn that each intervention in land and water management ask for additional and supportive actions. Unexpected interventiones force to adapt their strategies.	
		Social Learning HarmoniCOP Handbook	USF	1	workshop	Knowledge about steps in the unfolding of a collaboration process and on specific issues that need to be addressed, can be transmitted in short introductory seminars. Information on different levels of participation and	www.harmonicop.info

					reflection on the current and local state with regard to participation can put them on their way to more collaboration.	
	MCA AquaDelphos	USF	1	workshop	Allows stakeholders to assess different strategies according to social, economic and physical criteria under conditions of uncertainty.	
	role playing games	public domain	1	workshop	Allows a small group of stakeholders to assess and try out policy in terms of their own or others stakeholders' perspectives and to act out their or others' virtual responses to the policy.	
	Citizens' juries	public domain	1	workshop	Allows small sections of the public to take part in assessing their own management system in the form of juries listening to and judging expert views on problems and solutions. Elicits knowledge about public concerns about problems and their solutions.	van Asselt, M.B.A., Mellors, J., Rijkens-Klomp, N., Greeuw, S.C.H., Molendijk, K.G.P., Beers, P.J. and van Notten, P. (2001), *Building blocks for participation in Integrated Assessment: a review of participatory methods*. ICIS working paper I01-E003 ICIS, Maastricht, The Netherlands.
	public consultation	public domain	1	workshop	Another method of eliciting public responses to strategies from large sections of the public.	Wates, N. (2002) The community planning handbook. How people can shape their cities, towns and villages in any part of the world. Earthscan Publications Ltd, London.

Block 4: Implement Frameworks

Activities in AWRM block:
- Implementation of Action Plan

Block owner: Cranfield

Theme		Tools					
type	**owner**	**type**	**owner**	**Tool Phase ($1^{st}/2^{nd}$)**	**Training Method**	**Description**	**Background Information**
Adaptive-flexible Implementation strategies	Cranfield	Agile Project Management Training	Cranfield	1	workshop and exercises	Training on how to do project management while taking into account uncertainty, unpredictability, multiple stakeholders and feedback.	
Building Implementation Capacity (know-how, legislation, financial)	TU Delft / RBA	ICIW	Alterra	1	workshop	In ICIW the trainees become aware of the links between functions in water management tasks in an institutional setting and apply this in strategies for implementation of adaptive water management	

Block 5: Monitor and Evaluate Progress, Block owner: GEUS

Activities in AWRM block:
Monitoring of Processes
Evaluation of Progress

Block owner: Cranfield

Theme		Tools					
type	**owner**	**type**	**owner**	**Tool Phase ($1^{st}/2^{nd}$)**	**Training Method**	**Description**	**Background Information**
Monitoring of Processes	Alterra	MoST	WUR / GEUS	1	Workshop/ e-learning	Describes the importance of monitoring, indicates which aspects should be monitored and develops a monitoring plan using.	
		AMIS	IRSA	2	Workshop/ e-learning	Describes the importance of monitoring, indicates which aspects should be monitored and develops a monitoring plan using.	
Evaluation of Progress	GEUS	MoST	WUR / GEUS	1	Workshop / w e-learning	Describes the importance of monitoring, indicates which aspects should be monitored and develops a monitoring plan using.	
		Water poverty index	CEH	1	e-learning		
Participatory evaluation	Seecon	Social Learning HarmoniCOP Handbook	USF	1	workshop	Knowledge about steps in the unfolding of a collaboration process and on specific issues that need to be addressed, can be transmitted in short introductory seminars. Information on different levels of participation and reflection on the current and local state with regard to participation can put them on their way to more collaboration.	www.harmonicop.info
		Participatory evaluation techniques	public domain	1	workshop		

[1] In the 1^{st} phase we expect to use existing tools. In the 2^{nd} phase we also can use tools developed by NeWater (WB1 and 2). Where needed tools will be enhanced through NeWater WP4.2

Appendix II: Training Frameworks of Themes

This Appendix is meant as a reference mainly for internal project use, but gives the specification of the training material as described in further detail in the text of this *Training and Dissemination Plan*, deliverable 4.3.1 of the NeWater project.

Within each block there are lettered themes. For each theme the ***Learning Goals*** are give, which is then followed by a description of the ***Course Framework*** for the theme. In this ***Course Framework*** a brief summarisation is given of: a.) the elements that will be taught, b.) the tools/methods that will be taught, c.) the teaching methods, d.) the teaching medium, and e.) the length of the course.

The table directly below gives a quick overview of the Blocks and the themes within those blocks. The organisation that is responsible for these themes is also named.

Block 0	**Overview**		**USF**
	Theme	a. Introduction to integrated and adaptive water resources management	USF
		b. Software learning support	UNEXE
Block 1	**Establish Status/Build Commitment to Reform**		**TU Delft/ RBA**
	Themes	a. Monitoring/ data collection	Alterra
		b. Indicator Development	GEUS
		c. Dealing with multiple actors, ambiguous issues and diverging frames	COPP
		d. Stakeholder and institutional analysis	TU Delft/RBA
		e. Development of Stakeholder Commitment	SEECON
Block 2	**Analyse Gaps**		**Alterra**
	Themes	a. Participatory Integrate Assessment	SEECON
		b. Uncertainty assessment-models	USF
Block 3	**Prepare Strategy and Action Plan/ Build Commitment to actions**		**UNEXE**
	Themes	a. Use of Integrated Assessment (models)	UNEXE
		b. Participatory Integrated Assessment- strategy testing	SEECON
Block 4	**Implement Frameworks**		**CRAN**
	Themes	a. Adaptive Flexible Implementation Strategies	Cranfield
		b. Building Implementation Capacity	TU Delft/ RBA
Block 5	**Monitor and Evaluate Progress**		**GEUS**
	Themes	a. Monitoring	Alterra
		b. Evaluation of progress	GEUS
		c. Participatory Evaluation	SEECON

Block 0: Overview (USF)

Relevant elements from this block will be presented at the start of each training or independent module.

Theme A: Introduction to integrated and adaptive water resources management

Learning Goals

- Why adaptive water resources management
- Introduction to complex system thinking
- Adaptive and integrated planning cycle
- Difference of planning cycle to other planning approaches
- Role of uncertainties in IWRM (types and sources of uncertainties)

Course Framework for Theme A (USF)

Elements to be taught	Tools / Methods to be taught	Teaching Methods	Teaching medium	Length of course
Understanding concept of adaptive and integrated WRM	NeWater Conceptual Model (Management and Transition Framework) NeWater Portal	Workshop/E-learning	– Internet	
	AWRM curriculum	Workshop/E-learning	– Internet	
	Mulino	tbd		
Role and sources of uncertainties		tbd		

Theme B: Software learning support (UNEXE)

Learning Goal

Trainees learn how to use Decision Support System (DSS) in adaptive water management.

Course Framework for Theme B (UNEXE)

Elements to be taught	Tools / Methods to be taught	Teaching Methods	Teaching medium	Length of course
Software learning support	Decision Support System (DSS)	e-learning	– website	

Block 1 – Establish Status / Build Commitment to Reform (TU Delft/RBA)

What this Block 1 should be training is:

The general goal of the block is to:

teach participants, through training, how to lay the foundation for transition to adaptive management.

This foundation is built up on an understanding of the water system, the interests of the other stakeholders involved, and the possible methods that are available to them in order to gain commitment, to collect data and to monitor progress. Therefore, the participants will acquire an overview of:

- methods for planning, evaluating and implementing participation in order to build commitment to a planning process;
- methods through which stakeholder and institutional analyses can be conducted.

The participants will learn about the different interests of the various stakeholders and how a common ground between diverging parties can be found in order to realize an integrated solution. Thereby, insight will be given in the consequences of and reactions on changes in the water system. However, in order to keep track of possible changes in the system and of the progress of the transition to adaptive management, an overview will be given of a number of:

- methods for collecting and monitoring data;
- appropriate indicators to monitor progress towards predefined goals.

Participants will also learn how to consider which methods or indicators could be appropriate for realizing adaptive management in a manner that is appropriate for their specific situation.

Theme A: Monitoring / data collection (Alterra)

Explanation for approach

- In block 1 of the AWRM cycle, a basic inventory is one of the main things to establish. It should be clear that monitoring and data collection need to be included from the start. In the training on monitoring and data-collection this should be clearly stated.
- Typical aspects of AWRM are an integrated approach, risk management, uncertainty analysis, people's participation. With training on monitoring we wish to cover monitoring and data-collection in a wider sense, but we should make sure that these aspects are well covered.
- Preferably the approach followed should be an example of how to do it (walk the talk), therefore a monitoring/evaluation assignment with the participants of the training is to be included.
- Therefore, with regard to monitoring and data collection there are two levels on which monitoring and data collection should take place:

1. Programmes should be selected that can help to analyse the possible changes in water quality and quality. The use of these programmes and the organization of the collection of the relevant data are to be part of the training
2. Further indicators for monitoring the process of the adaptive water resources management cycle should be formulated according to the relevance for the process and the effectiveness in use. Organize data collection for this monitoring. This should also be included in the training

Learning Goals

1. To show why data collection/monitoring for adaptive water resources management (AWRM) is important.
2. Provide information on different monitoring / data collection methods.
3. Practically work on the 'how to do it' question regarding data collection/monitoring for adaptive water management:
    a. analyse needs/requirements on monitoring / data collection;
    b. decision making;
    c. implementation plan.

Course Framework for Theme A (Alterra)

Elements to be taught	Tools / Methods to be taught	Teaching Methods	Teaching medium	Length of course
Importance of monitoring / data collection for AWRM	Monitoring and data collection for AWRM content as well as AWRM process	Inventory from participants (brainstorm and discussion)	– plenary	– 1 hr
Methods for data collection/ monitoring	Analysis of own situation using the Monitoring & Evaluation HarmoniCOP approach WP1.6 (IRSA), 2nd phase	Lecture, self-study and assignment	– combined face to face and electronical	– 1 days
	Present the AMIS tool and compare (MoST, others local tools)	- explanation and exercise through demonstration model	– combined face to face and electronical	– 3 hours
Planning monitoring and data collection	Apply AMIS principles	– Assignment & presentation	– Job integrated assignment for 3 person groups	– 6 weeks

Theme B: Indicator development (GEUS)

Explanation for approach

- Evaluation of water scarcity is difficult and challenging due to the complexity of managing different scales and flow components for catchments exposed to climate change and the rise of the human populations many places, and often requiring transboundary and integrated water resource management. Therefore, investment of resources into more effective and equitable water management is required, which requires a proper selection of indicators for assessment of sustainability, and for monitoring water quality and quantity.
- One of the major challenges facing water managers and economists and others in relation to the achievement of sustainability is to expand the methodology of analyzing resource values (value of natural capital). Methods and indexes for linking the natural resources and socio-economic contexts thus are required. One such method is the water poverty index developed by CEH which is a practical example also describing many of the challenges in a broader context (and as such valuable for training as a written document describing the problems in broad terms)
- The water poverty index attempts to reflect both the physical availability of water, the degree to which humans are served by that water and the maintenance of ecological integrity. The index clusters components in five dimensions (components): access to water; water quantity, quality and variability; water uses for domestic, food and productive purposes; capacity for water management; and environmental aspects. The advantage of this indicator is its comprehensiveness, but as all such indicators a lack of intuitive understanding is a treat. Applications at the community level for pilot sites in Sri Lanka, Tanzania and Southern Africa are available. Stakeholders and developers see great potential in its use.
- Water Poverty index could be linked with the NeWater Portal and the CEH report (Evaluating your water) could be implemented with an introduction to adaptive water resources management and with evaluation based on ongoing WB2 activities and as such providing good and general training material for NeWater to be used by e-learning or to be downloaded and used for workshops and other training activities. Furthermore, the theme water poverty indexes could be further elaborated and explored with links to present material and knowledge bases elsewhere.

Learning Goals

1. Trainees learn about integrated water resource management and poverty indexes
2. Trainees become more aware of the importance of dealing with sustainability and poverty issues
3. Trainees gain insight into practical indicators for monitoring progress and feed back to adaptive water resources management
4. Trainees learn about a wide range of issues important for selecting appropriate management options in river basins.
5. Trainees improve awareness of links between poverty reduction and water management

Course Framework for Theme B (GEUS)

Elements to be taught	Tools / Methods to be taught	Teaching Methods	Teaching medium	Length of course
Water quality and quantity indicators	1. Surface water and groundwater quality and quantity issues 2. Managing water equitably and adaptive 3. Water and ecosystems 4. Water storage and adaptive capacity 5. Linking the natural resources and socio-economic contexts 6. Water, poverty and health 7. Water quality, water pollution and environmental impacts 8. Techniques for adaptive water management	E-learning: Evaluating your water: a management primer for the Water Poverty Index updated and uploaded to NeWater homepage, with AWRM. Discussions using the internet based on selected literature.	– Slides – Written instructions – Examples for pilot test sites (Tanzania and Southern Africa)	– 10 week course (e-learning)
Poverty indexes	Monitoring progress in adaptive water resources management (water poverty index)	Seminar (short lecture)	– Slides – lecture notes or papers, incl. illustrations	– 1 day workshop

Theme C: Dealing with multiple actors, ambiguous issues and diverging frames (COPP)

Explanation for approach

- We assume that the best way to learn how people behave and to discover appropriate ways of interaction is to experience this in real-time and real-life situations. Therefore we use behavioural simulations as learning tools.
- We assume that simulation training creates a safe environment for different stakeholders to learn together and thus build their capacity for acting and reflecting together (social learning). A simulation training focused on a learning task offers to stakeholders a shared experience with relational qualities.
- We assume that not all stakeholders may be willing to engage in simulation training. Getting to know the various concepts at a rational level, e.g. by means of short lectures ('Introductions to multiparty collaboration') may be a good start. However for skill development and for the application of concepts and processes in practice, more in-depth learning will be necessary (reflection on experiences and experimentation with own behaviour).

Learning Goals

- Trainees learn about multiparty or interorganisational collaboration: why (opportunities) and when (conditions).
- Trainees become more aware of the importance of dealing with the differences in an appreciative way.
- Trainees gain insight into interaction patterns between groups and individuals (actors, their representatives and their constituencies).
- Trainees learn about frames and the process of reframing through interaction.
- Trainees improve social skills as listening, dialoguing, connecting, and negotiating.

Course Framework for Theme C (COPP)

Elements to be taught	Tools / Methods to be taught	Teaching Methods	Teaching medium	Length of course
Playing and debriefing the existing simulation	1. Multiparty collaboration model 2. Interaction patterns and skills 3. Frames and (re)framing processes	Hands-on workshop using the Podocarpus National Park simulation as a learning tool	– slides – written instructions – video recordings	– ½ day workshop or - 1 day workshop
Characteristics and challenges of multiparty collaboration	The need for collaboration beyond organisational boundaries, different types of collaboration, the	Seminar (short lecture)	– slides – lecture notes or papers, incl. illustrations	– 1 or 2 hours

	collaborative task system			
How collaboration among multiple parties unfolds step-by-step.	The collaborative process: - problem setting - direction setting - implementation	Seminar (short lecture)	– slides – lecture notes or papers, incl. illustrations	– 2 hours
Specific issues of multiparty collaboration	Finding common ground, Framing and reframing, Dealing with differences, Social identity and inter-group behaviour, Positional versus interest negotiation, Building trust, Representing constituencies, Leadership, The role of the convenor	Seminar (short lecture)	– slides – lecture notes or papers, incl. illustrations	– 2 hours
Learning together to manage together. Improving participation in water management.	Approach as described in the HarmoniCOP handbook: initiating, organizing and evaluating a participation strategy that fosters social learning	Workshop: - lecture - reflection on current practice	– slides – HarmoniCOP handbook	– ½ day workshop
The importance of framing in natural resource management	Uncertainty and ambiguity in natural resource management Different actors, different frames Types of frames Issue framing: selecting, focussing, embedding Relational implications The use of language Negotiating frames in conversations	Seminar (short lecture)	– slides – lecture notes or papers – illustrations	– 2 hours

Strategies for dealing with frame differences	1. Action strategies: cognitive problem-solving, persuasive communication, dialogical learning, negotiation and conflict 2. Interaction patterns for 'doing differences' 3. Relational practices, learning for interdependence	Seminar (short lecture)	– slides – lecture notes or papers – illustrations	– 2 hours
Playing the existing simulation with an enhanced debriefing focused on identifying framing processes	1. Frames and (re)framing processes 2. Multiparty collaboration model 3. Interaction patterns and skills	Hands-on workshop using the Podocarpus National Park simulation as a learning tool	– slides – written instructions – video recordings – written training material	– ½ day workshop or – 1 day workshop
Playing a new simulation with a structured debriefing focused on framing processes, dealing with uncertainty and building learning capacity.	1. Frames and (re)framing processes 2. Social learning model 3. Multiparty collaboration model 4. Interaction patterns and skills	Hands-on workshop using a new simulation as a learning tool. This simulation will build on a situation of water management in a context of change and uncertainty.	– slides written instructions – video recordings – written training material	– 1 day workshop or – 2 day workshop

Theme D: Stakeholder and institutional analysis (TU/Delft and USF)

Explanation for approach

For this theme there are two training approaches, the approach as worked out by USF gives trainees an overview and information about a number of different tools that are available for carrying out institutional and stakeholder analyses. The second approach, that of the TU Delft/ RBA , looks at the use of one type of tool: the role-play, to realize enhanced stakeholder analysis.

Learning Goals

USF approach:

- to introduce trainees to principles of institutional and stakeholder analysis;
- to introduce trainees to practical methods;
- to teach trainees how to carry out a stakeholder analysis

TU Delft/ RBA approach:

To give trainees an increased insight in the consequences of and reactions on an extreme change in the water system, whereby trainees gain insight in:

- the influence of the network of stakeholders on the water system;
- the influence of the water stakeholders and their interdependence through the water system;
- their own and each other's points of view, interests, resources and strategies;
- the influence of an extreme change on the system (i.e. floods, droughts, demand increase through population pressure);
- the influence the change in the system has on the network of stakeholders.

Course Framework for Theme D (USF and TU Delft/RBA)

Elements to be taught	Tools / Methods to be taught	Teaching Methods	Teaching medium	Length of course
Characterization of individual stakeholder groups o goals o interests o resources o organisation structure o etc.	o Formalised methods, e.g. DANA o Interviews o Document/Text analysis	o Seminar o Hands-on tool workshop		– ½ day

Characterization of stakeholder interactions o type of networks o conflicts o power structure o etc.	o Formalised methods, e.g. DANA, o social network analysis	o Seminar o hands-on tool workshop		– ½ day
Characterization of regulatory frameworks o laws, directives o (ISO)-norms o etc.	o Document/Text analysis o interviews	o On-line documentation		– ½ day
Enhanced stakeholder and issue analysis	- Understanding the water system; - Influence of system on stakeholders; - Importance of understanding stakeholder network; - Understanding the collaboration process; - Importance of Action Planning.	Role play; Group discussion; - Individual/ group reflection; - Rope Exercise (understanding why joining forces is necessary).	- Scale model; - Written instructions; - Flip-overs; - Black/white boards	1 day, - max 2.

The purpose of the enhanced stakeholder-issue analysis tool is to show in what manner the water system influences and is influenced by the network of stakeholders. To understand this, the stakeholders thus need to learn about the network within which they find themselves and how the goals, interests and aims of the various stakeholders show the pluriformity, mutual dependency, closedness and the dynamics of the stakeholder network structure.

Theme E: Development of Stakeholder Commitment (SEECON)

Explanation for approach

- we assume that the best way to build commitment is through participation in the whole planning process,
- we assume that it is necessary to first have a broad overview of the vast range of methods for building commitment through participation,
- we assume that organized stakeholder and the general public need different approaches,
- we assume that the best way of learning these methods is via implementing them ('learning by doing') and therefore not only will the trainees use the tools within workshops, but also be encouraged to use them in their own case study as part of supervised project work.

Learning Goals

- Trainees have an overview of the range of methods for planning, evaluating and implementing,
  - organized stakeholder participation,
  - general public participation, for the purpose of building commitment to a planning process.
- Trainees learn how to select between methods depending on the goals of the planning process and goals of participation, and commitment goals.
- Trainees have hands-on experience of a selection of methods in both areas a) and b) such that they know how to build up commitment within both groups of stakeholders.

Course Framework for Theme E (SEECON)

Elements to be taught	Tools / Methods to be taught	Teaching Methods	Teaching medium	Length of course
What type of commitment can or needs to be built up? – Why build commitment? – Advantages? – Pitfall to avoid?		seminar	– slides – written training material	– 1/3 day workshop
Methods of building up commitment in organized stakeholder groups and in the general public	– Overview of Methods	Seminar, discussion	– slides – written training material	– ½ day workshop
Methods of building up commitment in organized stakeholder groups	Organized stakeholder-groups: – cognitive mapping – group model building	– seminar – hands-on tool	– slides – written training	– ½ day workshop

	– group moderation	workshops	material – training versions of the tools	
Methods of building up commitment in the general public	General public: – water calculator – large group response exercises – organizing public involvement campaigns	– seminar – hands-on tool workshops	– slides – written training material – training versions of the tools	– ½ day workshop
Starting up social learning processes	– Social learning handbook – how to start	– seminar	slides – workshop	½ day workshop
Building processes to encourage commitment	How to integrate what has been learnt into the trainee's own work	– long term project work e.g. via e-learning – exchange of experiences in concluding seminar	– e-learning internet server – e-learning material	– project work: over four month period

Block 2 – Analyse Gaps (Alterra)

Gaps analysis is to identify the gaps in management functions required for the (future) IWRM framework in the light of problem analysis, scenario development, goal formulation, and constraints identification. Consequently one has to select the tools to be used in the overall AWRM process for data management systems, monitoring systems, flood related systems, participation modelling management of trans-boundary water resources and the general framework for overall integration.

What this Block 2 should be training is:

To identify the gaps of tools such as 'concepts, models or methods' needed for:

- problem formulation, data collection and analysis
- scenario development, goals formulation and identification of constraints
- integrated assessment
- social learning, participatory and interactive processes

Theme A: Use of integrated assessment – models (Alterra)

Explanation for approach

Integrated assessment is creating a science/policy interface across sectoral boundaries. In every situation it needs to be defined what is to be 'integrated' and 'assessed'.

Learning Goal

How to use integrated assessment for adaptive water management – based on scenario analysis.

Course Framework for Theme A (Alterra)

Elements to be taught	Tools / Methods to be taught	Teaching Methods	Teaching medium	Length of course
What is integrated assessment?	WP 2.6: Scenarios analysis applied on Integrated modelling WaterGAP	workshop	face to face, oriented towards a practical situation	– 1 or 2 days
Present different scenarios				
How are scenarios put together?				

The role of models used in scenarios				
How to carry out a scenario analysis				

Theme B: Participatory Integrated Assessment (Gaps analysis) (SEECON)

Explanation for approach

- participatory integrated assessment is the use of organised and public stakeholders to:
- elicit the different interest group and social, economic and environmental perspectives concerning policy or management options

We assume:

- that it is necessary to first have a broad overview of the vast range of methods for participatory integrated assessment,
- that organized stakeholder and the general public need different approaches,
- that the best way of learning these methods is via implementing them ('learning by doing') and therefore not only will the trainees use the tools within workshops, but also be encouraged to use them in their own case study as part of supervised project work.

Learning Goals

- Trainees have an overview of the range of methods for carrying out participatory integrated assessment (PIA) for:
  - organized stakeholder participation,
  - general public participation.
- Trainees learn how to select between methods depending on the goals of the PIA process;
- Trainees have hands-on experience of a selection of methods in both areas a) and b) such that they know how to carry out PIA with both groups of stakeholders.

Course Framework for Theme B (SEECON)

Elements to be taught	Tools / Methods to be taught	Teaching Methods	Teaching medium	Length of course
Intro to PIA – Why do it? – Advantages? – Pitfalls to avoid?		seminar	– slides – written training material	– 1/3 day workshop
Methods for PIA with organized stakeholder groups and in the general public	– Overview of Methods	Seminar, discussion	– slides – written training material	– ½ day workshop
PIA with organized stakeholder groups	- Organized stakeholder-groups: – role playing games – MCA (AquaDelphos) – envisioning exercises	– seminar – hands-on tool workshops	– slides – written training material – training versions of the tools	– ½ day workshop
Participatory modelling to increase stakeholder involvement in decision making process under uncertainty	Bayesian network analysis	seminar	- slides - written training material	? day workshop
Social learning for gaps analysis	- social learning: how to manage	- seminar	- slides - handbook	½ day
PIA and the general public	General public: citizen's juries public consultation	seminar hands-on tool workshops	- slides - written training material - training versions of the tools	½ day workshop
Doing PIA for real	How to integrate what has been learnt into the trainee's own work	– long term project work e.g. via e-learning – exchange of experiences in concluding seminar	- e-learning internet server - e-learning material	– project work: over four month period

Theme C: Uncertainty assessment –models (USF)

Explanation for approach

Uncertainty assessment is derived from climate data derived from GCM models. The results give extreme weather events which are input on hydrological models resulting discharge estimations.

Learning Goal

- How to understand the process of predicting extreme weather events– based on scenario analysis
- How to analyse the discharge variation

Course Framework for Theme C (USF)

Elements to be taught	Tools / Methods to be taught	Teaching Methods	Teaching medium	Length of course
What is Uncertainty assessment	WP 2.2: variable Infiltration capacity VIC-model	workshop	face to face, oriented towards a practical situation	– 1 or 2 days – 3 weeks on-the-job assignment
How to deal with input data				
How analyse the effects on extreme discharge are				

Block 3 – Prepare Strategy and Action Plan / Build Commitment to ActionS (UNEXE)

What this block is training about the activities in AWRM cycle, such as Integrated Model Assessment and the Assessment of Measures: Hydro / Social / Economic, Fund Raising, Political / Stakeholder, Acceptance / Adoption.

What this Workblock 3 should be training is:

- how to prepare strategies and action plans at the river basin scale,
- how to assess the trade-off between different (hydraulic, social, economic, political) measures,
- how to address uncertainty in the decision making process
- how to increase adaptive capacity in integrated water management.

Theme A: Use of Integrated Assessment (models) (UNEXE)

Learning Goal

- Trainees have an overview of models and optimisation techniques for the purpose of decision making under uncertainty.
- Trainees learn how to select and use models and techniques in the decision making process.
- Trainees have hands-on experience of a selection of methods and application to case studies.
- Trainees learn to link-up Waterwise to the available hydrological software and provide data input (hydrologist)
- Trainees learn to provide the options for input and use the outcome of Waterwise (planners)
- Trainees learn to select Waterwise as a useful instrument for the given conditions
- Trainees learn that each intervention in land and water management ask for additional and supportive actions. Unexpected interventions force to adapt their strategies.

Course Framework for Theme A (UNEXE)

Elements to be taught	Tools / Methods to be taught	Teaching Methods	Teaching medium	Length of course
Waterwise Interface applications	- Waterwise interface - Applied models - Relevant input data	Hands-on exercises face to face, oriented towards a practical situation	Software, computer	– 5 days guidance during 3 months application process
(planners) Characteristics of Waterwise	- Waterwise input-output characteristics - selection of relevant software and data	- presentation of WaterWise and selected software - workshop on selection of input-output data	Presentation and discussion	– 0,5 day
AWRM process group	Conditions and possibilities of WaterWise	Presentation and discussion	Slides	– 1 hour
- Identification of interrelation between factors affecting the management of land and water use in a delta. - Adjustment of strategies	Splash! (computer game on land use and water management)	Introduction, game competition and evaluation on result and process	Computer game available on disc (e-learning)	– 0.5 day
Optimisation techniques to generate different management scenarios	Evolutionary algorithms	e-learning	– website	

Theme B: Participatory Integrated Assessment - strategy testing (SEECON)

Explanation for approach

This theme will focus on teaching about participatory integrated assessment and the use of organised and public stakeholders in order to:

- Learn about how to increase stakeholders involvement in the decision making process;
- Discuss and evaluate the pros and cons of different policy or management options from different interest group and social, economic and environmental perspectives;
- To come to a decision on preferred policy and strategies.

We assume that:

- it is necessary for trainees to first have a broad overview of the vast range of methods for participatory integrated assessment,
- organized stakeholders and the general public need different approaches,
- the best way of learning these methods is via implementing them ('learning by doing') and therefore the trainees will not only use the tools within workshops, but also be encouraged to use them in their own case study as part of supervised project work.

Learning Goals

- Trainees have an overview of the range of methods for carrying out Participatory Integrated Assessment (PIA) for
  - organized stakeholder participation,
  - general public participation.
- Trainees learn how to select between methods depending on the goals of the PIA process
- Trainees have hands-on experience of a selection of methods in both areas a) and b) such that they know how to carry out PIA with both groups of stakeholders.

Course Framework for Theme B (SEECON)

Elements to be taught	Tools / Methods to be taught	Teaching Methods	Teaching medium	Length of course
Introduction to PIA Why do it? Advantages? Pitfalls to avoid?		seminar	slides written training material	1/3 day workshop
Methods for PIA with organized stakeholder groups and in the general public	Overview of Methods	Seminar, discussion	slides written training material	½ day workshop
PIA with organized stakeholder groups	- Organized stakeholder-groups: role playing games MCA (AquaDelphos)	seminar hands-on tool workshops	slides written training material training versions of the tools	½ day workshop
Social learning for Strategy selection	- social learning – how to manage	seminar	slides handbook	½ day
PIA and the general public	General public: citizen's juries	seminar hands-on tool workshops	slides written training material training versions of the tools	½ day workshop
Doing PIA for real	How to integrate what has been learnt into the trainee's own work	long term project work e.g. via e-learning exchange of experiences in concluding seminar	e-learning internet server e-learning material	project work: over four month period

Block 4 – Implement Frameworks (Cranfield)

Workblock 4 will deliver training in:

- Knowledge and practical know-how in order to respond to change in the context of project management.
- Knowledge and understanding on building up implementation capacity in terms of:
  - local know-how for implementation
  - influencing legislation
  - getting funding and exploiting synergetic effects of multiple funding options

  This block is split into two themes, each of which addresses different aims from the above list.

Theme A: Adaptive Flexible Implementation Strategies (Cranfield)

Explanation for approach

- Long term planning is no longer appropriate and flexible management is required
- Project management methodology must be coherent with uncertainty and practitioners need to work with flexible, adaptive tools in order to respond to change easily.

Learning Goals

- Knowledge and understanding on how to implement strategies at the river basin scale.
- Knowledge and understanding on how to implement strategies so that they are flexible enough to be revised or altered as a result of the monitoring and evaluation carried out after implementation.
- Knowledge and understanding on how to implement strategies as part of an experimental 'learning by doing'-approach.

Course Framework for Theme A (CRAN)

Elements to be taught	Tools / Methods to be taught	Teaching Methods	Teaching medium	Length of course
Responding to change in plans and practice	Agile Project Management	Presentation, workshop and exercises	- slides - written instructions - large paper templates workshop materials	1 or 2 days depending on case study needs and availability

Theme B: Building Implementation Capacity (TU Delft / RBA)

Explanation for approach

For the implementation of adaptive management, implementation capacity needs to be build.

- We assume that leading principles in organising water management apply, for which changing conditions for water management need to be included
- We assume that capacity can be build, and that participants can formulate their own activities through the presentation of an analytical framework linking the relations between problems, functions, tasks and organization, with a practical reflection approach. People learn from typical case studies presented by staff combined with sharing the experience of the participants and reflection on this.

Learning Goals

ICIW: Trainees become aware of the links between functions in water management and tasks in an institutional setting and apply this in strategies for implementation of adaptive water management

Course Framework for Theme B (TU Delft / RBA)

Sub-themes to be taught	Tools / Methods to be taught	Teaching Methods	Teaching medium	Length of course
– Functions in water management – Tasks and approaches – Institutional set-up including users associations	ICIW: [framework presentation, practical assignment, video (to be made), presentation and discussions]	Workshop related to functions of water and tasks in management organisations may have.	face to face, oriented towards a practical situation, e-learning component for documentation ad literature search	3 days

Block 5 – Monitor and Evaluate Progress (GEUS)

Block 5 will deliver training in how to monitor and evaluate the effect of measures in an iterative fashion within an Adaptive Water Management Framework.

Theme A: Monitoring (Alterra)

Explanation for approach

- In block 1 of the AWRM cycle, a basic inventory is one of the main things to establish. It should be clear that monitoring and data collection need to be included from the start. In this block 5 monitoring is more related to the evaluation of the results in relation to the process.
- Typical aspects of AWRM are an integrated approach, risk management, uncertainty analysis, people's participation. With training on monitoring we wish to cover monitoring and data-collection in a wider sense, but we should make sure that these aspects are well covered.
- The approach followed should preferably be an example of how to carry the monitoring and evaluation out (walk the talk); therefore a monitoring/evaluation assignment with the trainees is to be included.
- Therefore, with regard to monitoring and data collection there are two levels on which monitoring and data collection should be discussed:
    - the possible changes in water quality and quantity: the use of these programmes and the organization of the collection of the relevant data
    - the process of the adaptive water resources management cycle should be formulated according to the relevance for the process and the effectiveness in use.

Learning Goals

- To learn why data collection/monitoring for adaptive water resources management (AWRM) is important;
- To receive information about different monitoring / data collection methods;
- Practical work on the 'how to do it' question regarding data collection/monitoring for adaptive water management;

- analyse needs/requirements on monitoring / data collection
- decision making
- implementation plan

Course Framework for Theme A (Alterra)

Elements to be taught	Tools / Methods to be taught	Teaching Methods	Teaching medium	Length of course
Importance of monitoring / data collection for AWRM	– Evaluation of the monitoring system as it functioned in the process on AWRM content as well as AWRM process	Presentation of field assignment and discussion	–	– 1/2 day
Methods for data collection/ monitoring	– Analyse the outcome of the applied monitoring methods such as AMIS, MoST, etc.	Lecture, self-study and assignment	– combined face to face and electronical interaction	– ½ day
Planning monitoring and data collection	– Advise for improvements in monitoring system or plan		–	–

Theme B: Evaluation of progress (GEUS)

Learning Goals

- Trainees learn about monitoring and evaluation of progress towards IWRM against suitable indicators;
- Trainees will learn to apply MoST for various purposes (comprehensive modelling for seven domains).
- Adaptation of MoST to IWRM cycle for evaluation of uncertainty and emerging unforeseen feedback from participation

Course Framework for Theme B (GEUS)

Elements to be taught	Tools / Methods to be taught	Teaching Methods	Teaching medium	Length of course
Introduction to MoST	Introduction to MoST (existing training material)	E-learning	Internet (MoST)	½ day
Groundwater domain of MoST	Introduction to groundwater modelling	Workshop	Internet + Workshop	½ day
Use of MoST for recording AWRM with IWRM	Application of MoST as a general recording tool	Workshop	Internet + workshop	1 day

Theme C: Participatory Evaluation (SEECON)

Learning Goals

- Trainees have an overview of the range of methods for evaluating processes using;
  a) organized stakeholder participation,
  b) general public participation, for the purpose of building commitment to a planning process.
- Trainees learn how to make a selection of the methods;
- Trainees have hands-on experience of a selection of methods in both areas a) and b) and learn about:
  - role of social learning in AWRM
  - processes in Social Learning (SL) and Public Participation (PP)
  - barriers and constraints to SL and PP.

Course Framework for Theme (SEECON)

Elements to be taught	Tools / Methods to be taught	Teaching Methods	Teaching medium	Length of course
How to Evaluate planning projects using stakeholders and the public	Participatory evaluation techniques	- seminar - workshop: hands on use of tools	slides case studies	½ day
Social learning	- social learning – how to improve – monitor and evaluation of process	- seminar	slides handbook	½ day
Building up evaluation processes	How to integrate what has been learnt into the trainee's own work	long term project work e.g. via e-learning exchange of experiences in concluding seminar	e-learning internet server e-learning material	project work: over four month period