Monitoring the Impact of Small Reservoirs Tools Application with Outcome Mapping

Authors

Tonya Schuetz, International Water Management Institute, Ghana

Martine Poolman, Delft University of Technology, The Netherlands

Natasja Sheriff, World Fish Center, Malaysia

Scope: questions/ challenges the tool addresses

The Outcome Mapping (OM) tool has been described as a 'method for tracking behavioral changes in development programs' by Smutylo (2005):

> *Outcome mapping is a methodology for planning, monitoring and evaluating development initiatives that aim to bring about social change. The process of outcome mapping helps a project team or program to be specific about the actors it targets, the changes it expects to see and the strategies it employs. Results are measured in terms of the changes in behavior, actions or relationships that can be influenced by the team or program. The methodology is comprised of several tools, which can be adapted to different contexts. It enhances team and program understanding of team processes, improves the efficiency of achieving results and promotes realistic and accountable reporting.*

Development of the methodology has been led by the International Development Research Center (IDRC) with the aim of providing an approach by which development project teams can monitor actions and activities are linked to development outcomes. It has been widely implemented in Asia, Africa and Latin America, and has prompted the development of an active online discussion group of practitioners who seek to apply and adapt the approach (The Outcome Mapping Learning Community http://www.outcomemapping.ca).

OM was developed to address the complexities of international development, where changes are non-linear, often not realized within the time frame of a project, and frequently not taking the form anticipated. However, the actions of the people involved will pave the way towards longer-term impact. The approach seeks to influence the behavior of actors involved in projects so as to foster sustainable project outcomes. Behavioral changes are more easily monitored than ultimate developmental impacts which may be influenced by non-project factors as well as project outcomes, making attribution difficult or impossible.

The focus on process, learning and change in behavior, relationships, actions and activities of people and organizations, makes OM an innovative approach for assessing and interpreting impact. The methodology is centered on the identification of 'boundary partners' with whom the program interacts directly and which the program hopes to influence[1]. Project participants and beneficiaries are encouraged to reflect on the processes that need to be in place to achieve and sustain developmental impact.

[1] This discussion of Outcome Mapping draws on Smutylo (2005) and Earl et al. (2001).

OM may therefore be a useful approach to apply in the context of the Small Reservoirs ToolKit. It can be used as a means to follow-up on the implementation, usage and impacts of the Toolkit. We provide some initial thoughts on how to monitor the process whereby stakeholders learn about, and learn to effectively use, the tools from the Small Reservoirs ToolKit. Although several examples are given in OM documentation, applying OM requires customizing the content to the specific implementation scenario together with the people involved, and possibly selecting a subset from the set of tools.

Target group of the tool

Researchers, implementers and users of components of the Small Reservoirs ToolKit

Requirements for tool application

Resources - human and financial – for the initial development of the OM monitoring framework, follow-up monitoring visits, facilitation of the process and the analysis of the collected data

Tool: description and application

This tool description abridged version draws on the book *Outcome Mapping. Building Learning and Reflection into Development Programs* by Earl and Smutylo (2001) and the IDRC web site, www.idrc.ca. The examples provided below demonstrate the use of OM in monitoring of the application of a Knowledge Sharing tool "Understanding each other: Creating Common Ground" as part of the Small Reservoirs ToolKit. The Knowledge Sharing tool aims to encourage communication among small reservoir stakeholders, including researchers, reservoir managers, and water users. We perceive OM as a useful way to plan, monitor and evaluate the implementation of the Knowledge Sharing tool, its progress, and the changes in attitudes and behavior of the target group that result from the use of the tool. It is a flexible tool that can be used in many situations and its application to the Knowledge Sharing tool is presented purely as an illustration.

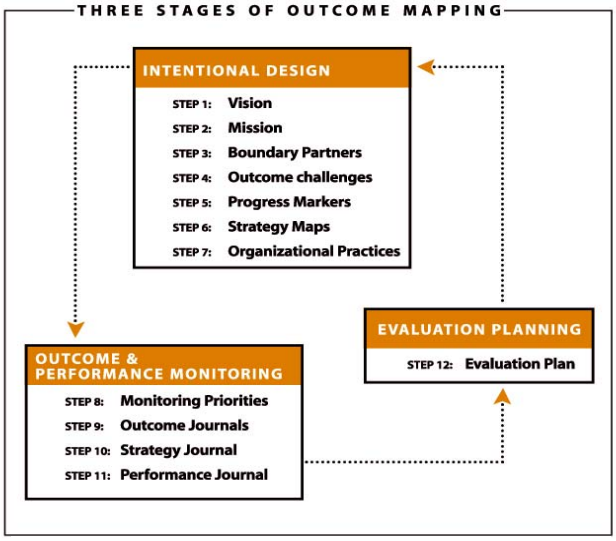

Figure 1: Outcome Mapping Stages and Steps, Source: Earl et al. 2001

OM encourages learning participation, supports users in planning and implementing change, and fosters communication and discussion among stakeholder groups across scales and disciplines. The components of the OM tool can be used sequentially or selectively, depending on project needs.

OM is a three stage process. The first stage, Intentional Design, clarifies the overall objectives of the program/project in terms of the changes it is meant to bring about and the strategies used to achieve these changes (Smutylo 2001). Intentional Design helps to answer the Why? How? Who? and What? of the program/project, defining and developing in OM terms the program's/project's Vision, Mission, its Boundary Partners (those people the project directly interacts with and can influence), a description of how progress can be observed in the Progress Markers, a Strategy Map of how the changes should be brought about, and the Organizational Practices describing how the teams and partners work together (Figure 1). The second stage, Outcome and Performance Monitoring, uses journals to chart changes in the indicators (Progress Markers) defined in stage one. The full OM process includes monitoring outcomes with an Outcome Journal, strategies and activities with a Strategy Journal, and the organizational practice with a Performance Journal. The third stage, Evaluation Planning, sets the program's/project's evaluation priorities.

By focusing monitoring and evaluation activities on identified boundary partners, the project is able to obtain feedback from these partners that can help improve the performance of the activities. It also ensures the involvement and continuous communication with these partners.

The following sections will further describe Stage 1, Intentional Design, covering steps 1-7 of the OM process. First, OM terms are explained. OM application is then illustrated using hypothetical examples based on an actual Small Reservoirs Project. As noted above, examples refer to the Knowledge Sharing tool, which itself focuses on enhancing stakeholder interaction and improving communication among and between small reservoir stakeholder groups, including researchers, reservoir managers, and water users. Examples were drafted but not followed through completely due to limitations of resources. They were used as a way of documentation for different research students working on the same process.

Vision

A description of the development changes (economic, political, social, technological or environmental) that the project envisions.

Example: *In the further development of small water reservoirs in the Upper East Region of Ghana, solutions are often approached from a technical viewpoint. Technical improvements are key to sustainable development of reservoirs and their effective functioning as sources of water supply for dry-season irrigation. However, implementing technical improvements and getting water users to accept them are often difficult to achieve.*

Responsibility for reservoir development is often placed on water users. However, agricultural extension workers, decision-makers at district and regional levels, local research institutes and NGOs can also assist with reservoir development. Compared to water users, these tend to have better access to information about reservoir development. Yet, communication between these groups is often limited and can be hindered by cultural, traditional and educational factors.

Better understanding of each others' aims, views and goals can help improve communication among stakeholders. This can lead to better small reservoir development strategies. However, achieving this understanding depends on: the manner in which stakeholders are able to and are willing to learn; the means of communication with which stakeholders are familiar and comfortable, and to which they have access; the manner in which information (technological or social) is packaged so that people with various

backgrounds can understand it.

Mission

A description of how the project intends to support achievement of the vision. The mission states the areas in which the project will work, but does not list all the activities in which the project will engage.

Example: *This Knowledge Sharing pilot project focuses on the manner in which information and knowledge can be shared between researchers, small reservoir water users, agricultural extension agents, agricultural decision-makers at district and regional levels, local research institutes and relevant NGOs.*

The project's mission is to examine how these stakeholders can be supported:

*in **gathering** information that is relevant to their goals and aims in reservoir development*

*in **packaging** information to which they have access, and that can help improve reservoir development*

*in **exchanging** information and knowledge with other stakeholders with whom they have direct contact.*

Thereby, the project aims to bring about changes in the manner in which information and knowledge are gathered, packaged and exchanged by stakeholders. The project will take account of cultural, traditional and educational factors that may hinder such exchange. To achieve this, the project will work with stakeholders to identify and design relevant, applicable and acceptable means of information and knowledge exchange.

Boundary Partners

Individuals, groups or organizations with which the program interacts directly and on whom the program can anticipate some opportunities for influence.

Example: *Reservoir water users, Agricultural Extension Agents (AEAs), District Departments of Agriculture, Regional Ministry of Agriculture, Technical University Delft, University of Development Studies Navrongo*

Outcome Challenge

Description of the ideal changes in the behavior, relationship, activities and/or actions of a boundary partner. These can be logically linked to a project's activities although they are not necessarily directly caused by it. The changes are aimed at contributing to specific aspects of human and ecological well-being by providing the boundary partners with new tools, techniques and resources to contribute to the development process.

Example: *Reservoir water users exchange information and knowledge with water users of other communities, extension agents, and researchers such that their priorities and needs become clear. They gain an improved sense of ownership of reservoir structures, and become pro-active in developing strategies for reservoir maintenance and/ or securing support from others for such maintenance.*

Example: *Agricultural Extension Agents (AEAs) act more directly as intermediaries between water users and District Departments of Agriculture [packaging and exchanging information]. They respond quickly to questions from water users by securing back-up from District Officers, as necessary. In general, they support water users in their quest for information rather than merely dismissing them as ignorant, simple or naïve. They communicate with water users in a manner as befits their capacities and capabilities.*

Example: *A Regional Ministry of Agriculture learns more about what happens at the district and reservoir levels concerning information and knowledge exchange [gathering] and shares information from regional researchers and from other regional ministries with district departments.*
Example: *University of Development Studies Navrongo students and lecturers become stronger partners in information gathering, packaging and exchange networks that aid reservoir development in the UER. These networks include water users, AEAs, district departments and the regional ministry. They are aware of the obstacles that stand in the way of information exchange (such as cultural, traditional and educational factors) and are able to interact, link up, and realize synergies with other projects in the UER.*

Progress Markers

A set of graduated indicators of boundary partner behaviors that focus on the depth or quality of change. They are a set of statements that describe the progress in boundary partner behavioral change. They also indicate changes in actions, activities and relationships that lead up to the ideal outcome challenge statement. The range of markers may extend from minimum change in boundary partners' behavior ("expect to see boundary partners doing …") to medium change ("like to see …") and maximum change ("love to see …"). Minimum, medium, maximum can also be linked or interpreted as short, medium, and long-term indicators. Agreement is needed on time-frames, e.g., within the current year (short-term), within the lifetime of the project (medium-term), three years beyond the project (long-term).

Examples: See Annex

Outcome Journal

A data collection tool for monitoring the progress of a boundary partner in achieving progress markers over time. The outcome challenge and the progress markers become part of the Outcome Journal (see Figure 2)

Strategy Map

A matrix that categorizes six strategy types (causal, persuasive, and supportive: strategy categories 1, 2 and 3, respectively) that a program employs to influence a boundary partner. Strategies are either aimed directly at the boundary partner (strategy I) or at the environment in which the boundary partner operates (strategy E).

Strategy Maps are meant to outline the project's approach to working with the boundary partner. They show the strategies to be undertaken by the project in achieving Outcome Challenges for each boundary partner. They help in pinpointing strategic gaps in the approach and developing appropriate evaluation methods for tracking and assessing project performance.

Table 1 gives an indication of the type of question/strategy that fits within the above described framework.

Figure 2. Example format for an Outcome Journal:

Outcome Journal: « Boundary Partner »				
Date: « of monitoring »				
Contributors to Monitoring Update: Names: …….. contact, e.g. phone no.: ……..				
Outcome Challenge:				
Evaluation scheme (Example): ***L****ow= 0-40%* ***M****edium = 41-80%* ***H****igh = over 80 %*				
Progress Markers				
L	**M**	**H**	**Short-term –** "Expect to See"	**Who? Observations, comments**
			1.	
			…	
			4.	
L	**M**	**H**	**Medium-term –** "Like to See"	**Who? Observations, comments**
			5.	
			…	
			12.	
L	**M**	**H**	**Long-term –** "Love to See"	**Who? Observations, comments**
			13.	
			14.	
			15.	
DESCRIPTION OF CHANGE:				
CONTRIBUTING FACTORS & ACTORS:				
SOURCE OF EVIDENCE:				
LESSONS & REQUIRED PROGRAM CHANGES/ REACTIONS:				

Table 1: Types of questions and strategies (Source: Earl S., Carden F, and Smutylo T (2001) *Outcome Mapping: Building Learning and Reflection into Development Programs*. International Development Research Center, Ottawa, Canada)

STRATEGY AND ACTIVITIES AIMED AT →	**a specific individual or group (I)**	**an individual or group's environment (E)**
CAUSAL - 1	*What will be done to produce an immediate output?*	*What will be done to change the physical or policy environment?*
PERSUASIVE - 2	*What will be done to build capacity?*	*How will you use the media or publications to promote your work?*
SUPPORTIVE - 3	*How will sustained support, guidance or mentoring be provided to the boundary partner? By whom?*	*What networks/ relationships will be established or used?*

Example: For Reservoir Water Users

Outcome Challenge:

Example: Reservoir water users exchange information and knowledge with water users of other communities, extension agents, and researchers such that their priorities and needs become clear. They gain an improved sense of ownership of reservoir structures, and become pro-active in developing strategies for reservoir maintenance and/ or securing support from others for such maintenance.

STRATEGY AND ACTIVITIES AIMED AT →	**a specific individual or group (I)**	**an individual or group's environment (E)**
CAUSAL – 1	*Gaming activities will be carried out with reservoir water users which will cover aspects of the following tools:* *- stakeholder analysis* *- social network analysis* *- risk assessments* *- communities of practice* *In order to help communities become more aware of information that is available to them, and to work together to find ways to receive, process and disseminate such information within the community.*	*The project aims to change the policy environment of reservoir water users. The project focuses on adjustments in how policy makers (and those who implement these policies) gather, share and disseminate information.*
PERSUASIVE - 2	*Exchange of goals, views, aims and interests between AEAs, researchers and water users will take place. In this way stakeholders will learn more about each other and the manner in which information/ knowledge exchange can take place.* *Reflection sessions will be initiated to learn from experiences and to build on these experiences (individually and collectively).*	*If and where applicable, local radio and word-of-mouth communication will be used to promote the project's work to other water users.* *Papers will be published to share the work with the research world (local and international).* *Close cooperation with local people and departments of agriculture will help in ensuring promotion.*
SUPPORTIVE - 3	*Sustained support, guidance or mentoring will be provided through the AEAs in the long-term. However, during the course of the project, the project team will ask regularly for "after-action" reviews. This will help ensure that continuous improvement in learning and changes takes place.*	*The researchers will establish working relations with the water users.* *The relationship between water user and AEAs will be further strengthened, as will the network between the AEAs and departments of agriculture. This will enable farmer information/ knowledge to be exchanged in a more effective manner.*

Organizational Practices

In Figure 1, the seventh step focuses on "Organizational Practices", that is, organizational or team practices to be used by the implementing agency of the project in order to fulfill its mission and contribute to intended behavioral changes by project boundary partners. Organizational practices are categorized in eight groups with each group representing key activities that enable the project to remain relevant, innovative, sustainable, and connected to its environment.

Example	
1. Prospecting for new ideas, opportunities, & resources	*The project keeps up to date with the developments in African and worldwide development activities, with a focus on technological development – and also developments in social research both within and outside of water management.*
2. Seeking feedback from key informants	*The project works closely with researchers from the region (such as from UDS Navrongo), as well as those who are active in the region (i.e. from SARI and IFPRI). Also feedback will be solicited from the White Volta Basin Officer and members of district assemblies.*
3. Obtaining the support of your next highest power	*Since this project is part of the CGIAR IWMI Knowledge Sharing Research pilot project[2], it already engages IWMI researchers. It also engages those likely to continue knowledge and information exchange in the future.*
4. Assessing and (re)designing products, services, systems, and procedures	*Project staff members communicate regularly, and review activities with boundary partners and with key informants (described in practice 2: "Seeking feedback from key informants."). By reviewing designs with boundary partner, design adjustments can be made.*
5. Checking up on those already served to add value	*Through regular check-ups reservoir communities who have been "served" by the project, along with their AEAs and district Departments of Agriculture, the project will be able to add value to activities that have already been implemented and those yet to be undertaken.*
6. Sharing your best wisdom with the world	*Wisdom that has been gained will be shared through publications, IWMI's "knowledge fair", classes and colloquia held at TUDelft and UDS and a possible conference.* *It is also envisioned that this knowledge sharing pilot project will be the starting point of a number of M.Sc. and PhD theses.*
7. Experimenting to remain innovative	*The project allows the research team ample time and possibilities to reflect on its organizational practices and the manner in which the project in proceeding.*
8. Engaging in Organizational Reflection	*Each intervention and activity is seen as an opportunity to learn. Since the nature of the project is to gather, package and exchange information, this requires continual reflection in order to design an exchange system that suits the goals, aims, views and interests of boundary partners.*

[2] **See http://ictkm.cgiar.org/**

Outcome Mapping for the Small Reservoirs Project was applied to provide continuity of different students working in the field with the same stakeholder groups looking at research questions from different angles. It provided additional documentation and allowed individual students to include their own perceptions. OM was used to capture the changes in behavior and attitude among water users with regards to the application of small-scale solutions (see G. van Dijk, *Small-Scale Solutions for Sustainable Development Improving small water reservoirs with local resources*, 2007). For this purpose the focus was on the Outcome Journals. The initial draft of indicators for the Water Users and the Agricultural Extension Agents, the progress markers, describing the change towards their individual contributions to the vision, were up-dated, adjusted and monitored together with key representatives of the two groups. In total a number of ten people (one from MoFA, two from AEA, seven water users, two women, eight men) contributed and participated in the monitoring and adjustment of the defined indicators. This work is seen to be a starting point for the implementation of other tools included in this Small Reservoirs ToolKit.

Lessons learned

Lessons learned are drawn from the examples provided above, as well as from experiences in OM in other projects[3]:

- Personal meetings during OM implementation steps are very important. It is even more important in project/ program environments with limited or no ICT facilities (telephone, e-mail, internet, fax, computer etc.). This applies to the development of the tools within the Intentional Design stage as well as to the Outcome and Performance Monitoring and Evaluation Planning stages.

- The time and resources needed for capacity building in OM was often underestimated, especially where participation and "speaking up" in the presence of superiors or authorities is an additional process of change in attitude and behavior.

- OM theory contains many technical terms that need to be translated into meaningful simple terms for partners. OM steps or tools are translated into practice for specific target groups and purposes. This is important to enable and encourage participation of partners at different scales. When applying OM at the grass-roots level, it is unnecessary to highlight its underlying theory. For example, participants found it easier to interpret "short, medium and long term" with a calendar time definition (e.g. this year, within the next two years, after five years) rather than the suggested terminology of "expect to see", "like to see" and "love to see".

- Applying the full OM methodology can be cumbersome, especially if it is not the only monitoring and evaluation device applied. It requires a lot of resources – human as well as financial. It is challenging to get partners to participate in such a time-consuming

[3] The lessons learned are also drawn from two other projects, the RUAF *Cities Farming for the Future Program* (Anglophone West Africa Region) and the Challenge Program project *Community-based Fish Culture in Seasonal Floodplains*, led by the WorldFish Center.

process. On the other hand, if less time is spent on reflecting, clarifying and discussing issues raised, the quality of analysis and evaluation may be affected, especially, when various cultures, languages and non-native speakers are involved.

- By creating a future vision of a successful project, project participants were encouraged to reflect on the linkages between their own activities and the achievement of that vision. This step can create a stronger sense of responsibility and empowerment in participants. It allows them to recognize their own role in project success while reducing dependency on external agents.

- OM provides a process to ensure that stakeholders are familiar with project objectives and to identify the participants' varying expectations.

- The identification of Boundary Partners clarifies the role of different stakeholders in the implementation, responsibility and accountability for project success. Bringing together stakeholders from different scales (including researchers) allows groups to articulate their expectations of one another in the achievement of project goals, with indicators identified to formalize the relationships and responsibilities among groups.

- The development of Outcome Challenges and Progress Markers facilitated the identification of constraints that the partners were sometimes not able to articulate and/ or voice before.

Recommendations

- It is important to allocate enough resources for capacity building of local trainers or key partners in OM. Budgets should be shaped so as to support an adequate number of personal meetings and visits for monitoring, follow-up and clarification, especially in a project environment with limited or no ICT facilities and a considerable illiteracy rate.

- When OM is applied in several countries, regions and locations it can be useful to train local trainers as mediators in enabling exchange of experience among local partners. In an environment with limited ICT facilities, personal meetings will be required: this has budget implications (from RUAF Cities "Farming for the Future" Programme).

- To apply OM effectively we found it important to reserve, in each of the various stages, adequate time for reflection and conceptualization of OM usage. OM offers the flexibility to choose from a variety of three stages (with a total of twelve steps) the ones that best fit the purpose of the particular project scenario.

- The issue of illiteracy needs particular attention in implementing OM steps and handling follow-up. We found that working with pictures or drawings can facilitate the participation of partners who are not used to reading and writing (see also the Knowledge Sharing tool in this tool kit).

- Translating OM into local languages, going beyond English, French or Spanish enriches discussion but requires additional time for reflection and action. Additionally, the process

of translating OM workshop outcomes back into the project reporting language is vulnerable to biased interpretation on the part of the person responsible for the translation.

- We have not found any single remedy to solve the issues of dealing with illiteracy or local languages and different cultures, but found that OM offers the flexibility to pay attention to different mindsets and concepts. However, it requires extra time and a lot of going back and forth with partners and possibly professional translators.

- OM is strongly participatory in its application and is a relatively complex process. Where the process is being communicated to a group for whom the language of the trainer/ facilitator is a second language, there is the risk that the concepts that lie at the heart of OM are misinterpreted and mis-communicated. It is necessary to ensure that the ideas and key elements are thoroughly cross-checked to ensure the quality of the developed steps.

- Participatory methods are an expected component of research and development work, yet they require skill and experience if they are to be applied well. Sometimes it is necessary to involve the services of consultants and to gradually build the capacity of project partners.

- The skills needed to guide project participants through the selection of progress markers, without exerting a modifying influence, also take time and experience to acquire. Whilst facilitating with a neutral point of view it is important to ensure the participation and contribution from all participants to the development of the OM steps, i.e. so that more powerful individuals do not use the OM concept of ‘behavioral change’ to exert their influence on weaker members, putting in place markers to influence and control the activities of others.

Limitations of the tool

- The idea of ‘behavioral change’ should be handled with caution if OM does not intend to move into the realm of social engineering, with influence and change externally imposed. However, long terms goals of increased cooperation between community members and greater solidarity will serve to empower and provide a strong base for future community initiated schemes.

- When applying OM to research projects it is important to bear in mind that research is the primary focus and that monitoring tools such as OM should support and improve the research work, e.g. in the way that different stakeholders’ views are reflected and taken into account for the research project and can give guidance for the direction of the needed information the research targets to provide. In its complete form, many scientists are unlikely to take up the OM methodology as part of their project monitoring and evaluation plan.

References

Earl S., Carden F, and Smutylo T (2001) *Outcome Mapping: Building Learning and Reflection into Development Programs*. International Development Research Center, Ottawa, Canada

Sheriff, N. and Schuetz, T. (2008) *Monitoring for change, assessing for impact: the WorldFish Center experience*, Paper presented at the workshop on 'Rethinking Impact: Understanding the Complexity of Poverty and Change', Cali, Colombia 26-29 March 2008. http://www.prgaprogram.org/riw/Abstracts.htm#S

Smutylo, T. 2001. *Crouching impact, hidden attribution: overcoming threats to learning in development programs*. Ottawa, Canada: International Development Research Centre: http://www.idrc.ca/en/ev-26968-201-1-DO_TOPIC.html

Smutylo, T. (2005) *Outcome Mapping: A Method for Tracking Behavioural Changes in Development Programs*, ILAC Brief 7, CGIAR.

Contacts and Links

Tonya Schuetz, t.schuetz@cgiar.org

Martine Poolman, m.i.poolman@tudelft.nl

Natasja Sheriff, n.sheriff@cgiar.org

Annex - Examples Progress Markers

Progress Markers				
Reservoir Water Users	***Agricultural Extension Agents (AEAs)***	***District Departments of Agriculture***	***Regional Ministry of Agriculture***	***Technical University of Delft***
Short-term – "Expect to See"				
▪ *Participating in knowledge/information exchange activities (such as gaming)*	▪ *Participating in knowledge/information exchange activities (such as gaming).*	▪ *Participating in knowledge/information exchange activities (such as gaming)*	▪ *Support knowledge/information exchange activities by making available already gathered information;*	▪ *Take leading role in knowledge/information exchange activities;*
▪ *Acquire more knowledge about the technological information that researchers have or can gather*	▪ *Acquire more knowledge about the technological information that researchers have or can gather.*	▪ *Acquire more knowledge about the technological information that researchers have or can gather*	▪ *Collect and learn from information gathered during the exchange activities;*	▪ *Gather, package and exchange information gathered during the exchange activities with fellow students, lecturers, researchers in Ghana and in the Netherlands;*
▪ *Share knowledge/ information with researchers and AEAs in order to design and develop means of information exchange that are relevant to them*	▪ *Share knowledge/ information with researchers , water users and district directors of agriculture in order to design and develop means of information exchange that are relevant to them;*	▪ *Share present knowledge/information with researchers , water users and AEAs in order to help design and develop means of information exchange that are relevant to them*	▪ *Share present knowledge/information with researchers and district departments to help design and develop means of information exchange that are relevant to them.*	▪ *Share present and gathered knowledge/information with other researchers (local and international), the district departments, the regional ministry of agriculture, the water users, and the AEAs to help design and develop means of information exchange that are relevant to others' goals, aims, views and interests.*

Medium-term – "Like to See"				
▪ *Articulate their goals, aims, views and interests in reservoir development clearly to Agricultural Extension Agents and researchers*	▪ *Articulate their goals, aims, views and interests in reservoir development clearly to the district department of agriculture (mainly the director hereof) and researchers*	▪ Articulate their goals, aims, views and interests in reservoir development clearly to the reservoir water users, the AEAs and researchers	▪ *Articulate their goals, aims, views and interests in reservoir development clearly to the district departments and researchers;*	▪ *Articulate their goals, aims, views and interests in reservoir development clearly to the district departments, AEAs and water users;*
▪ *Request support from AEAs and researchers before problems have grown too large and are difficult to solve*	▪ *Request support from the district director, other district officers (i.e. those who are experts in forestry, livestock, etc.), other AEAs and researchers before problems have grown too large and are difficult to solve*	▪ *Articulate their capacities and means to support reservoir development to researchers, water users and AEAs;*	▪ *Articulate their capacities and means to support reservoir development to researchers and district departments;*	▪ *Articulate their capacities and means to support reservoir development to the district departments, AEAs and water users;*
▪ *Make more use of subjects handled in past workshops organized by the district department of agriculture*	▪ *Build up on the subjects handled in past workshops organized by the district department of agriculture (see the LACOSREP projects)*	▪ Request support from the other districts, the regional ministry of Agriculture, and researchers before problems have grown too large and are difficult to solve;	▪ *Work together with the White Volta Basin Board to support reservoir development and information exchange activities;*	▪ *Work together with the White Volta Basin Board to support reservoir development and information exchange activities;*
▪ *Indicate when they think they lack sufficient information/knowledge to make maintenance and farming decisions*	▪ *Indicate when they think they lack sufficient information/knowledge in order to assist water users in making maintenance, development and farming decisions*	▪ *Build up on the subjects handled in past workshops organized by the district department of agriculture (see the LACOSREP projects) to examine where there are still knowledge lacunae*	▪ *Package information that was gathered as part of other regional agriculture projects concerning reservoir development (such as the LACOSREP projects) and making it available to the district departments;*	▪ *Package information that was gathered during exchange activities and make it available to the district department of agric (this does imply that the information has been packaged in a manner that makes it possible for the department to share it with the AEAs and the AEAs with the water users*
		▪ *Indicate to regional departments and research institutes when they think they lack sufficient information/knowledge in order to assist water users in making maintenance, development and farming decisions*	▪ *Indicate to other regional departments and research institutes when they think they lack sufficient information/knowledge in order to assist district departments in supporting water users;*	▪

Progress Markers				
Reservoir Water Users	***Agricultural Extension Agents (AEAs)***	***District Departments of Agriculture***	***Regional Ministry of Agriculture***	***Technical University of Delft***
Long-term – "Love to See"				
▪ *Have a sense of ownership of the reservoir works so that they feel more empowered to take action in order to maintain, fix or develop the reservoir and its works*	▪ *Help water users develop a sense of ownership of the reservoir*	▪ *Support AEAs in helping water users develop a sense of ownership of the reservoir*	▪ *Support district departments of agriculture in helping water users develop a sense of ownership of the reservoir;*	▪ *Take up some of the lessons learned in courses given to MSc students who want to go to developing countries;*
▪ *Share lessons and experiences with other reservoir communities in the district*	▪ *Share lessons and experiences with other AEAs in the district*	▪ *Share lessons and experiences with departments of agriculture in other districts;*	▪ *Share lessons and experiences at national level;*	▪ *Exchange lessons and experiences with fellow lecturers;*
▪ *Influence reservoir development (research, maintenance and construction) activities at the district and regional level*	▪ *Help influence reservoir development (research, maintenance and construction) activities at the district and regional level by acting as intermediary between water users and the district department of agriculture and researchers*	▪ *Help influence reservoir development (research, maintenance and construction) activities at the district and regional level by using information gathered from AEAs about reservoir communities' aims, goals, views and interests in reservoir development.*	▪ *Help influence reservoir development (research, maintenance and construction) activities at the regional level by using information gathered from the past and from other regions (in Ghana or in similar regions in Burkina Faso).*	▪ *Help influence reservoir development (research, maintenance and construction) activities at the regional level by using information gathered from the past and from other regions and projects.*