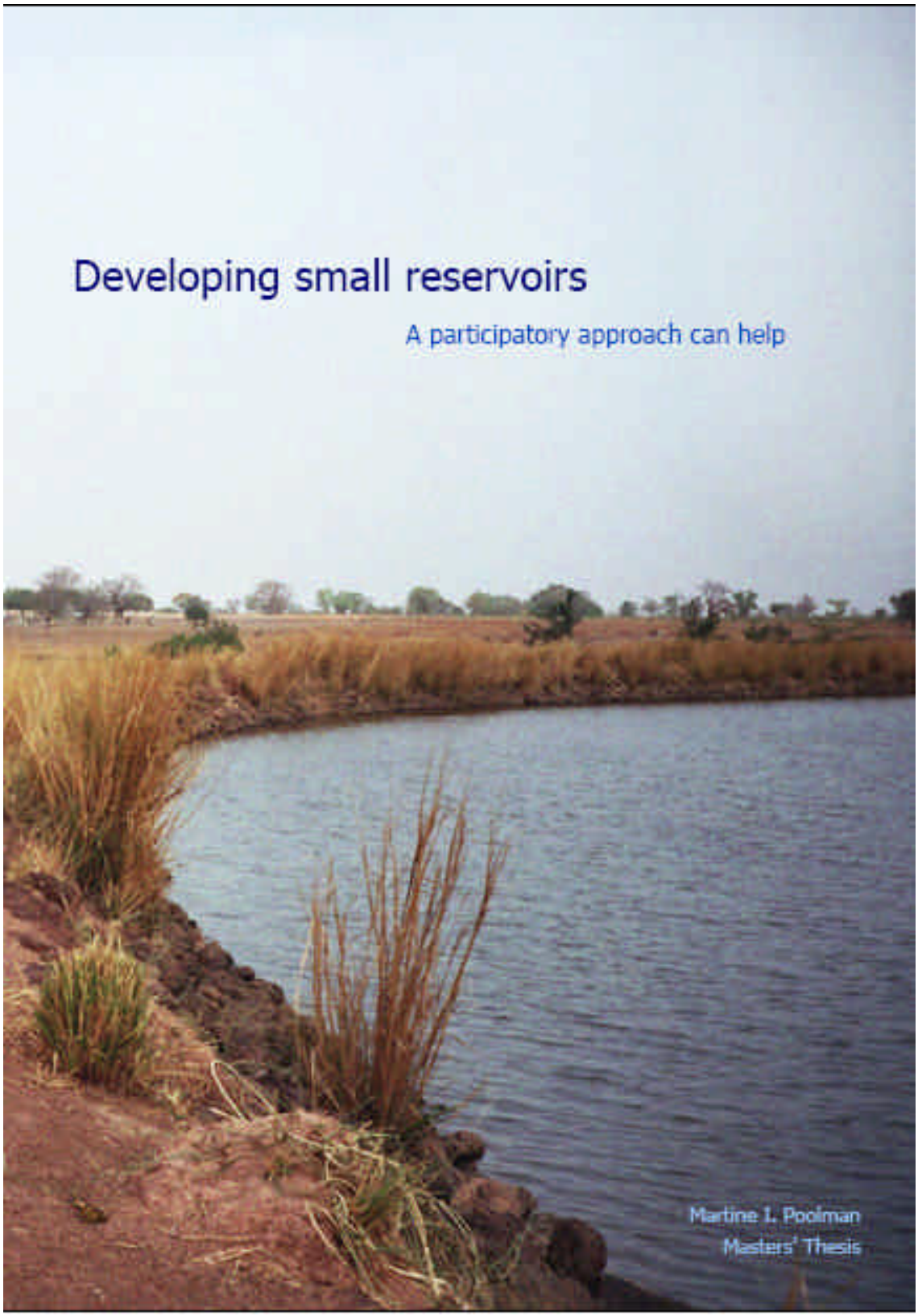
Developing small reservoirs

A participatory approach can help



Martine I. Poolman

Masters' Thesis

Developing small reservoirs

A participatory approach can help

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July 2005, Delft, the Netherlands

Masters' Thesis
Section: Policy Analysis
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SMALL RESERVOIRS PROJECT
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You can't solve the problems of today by thinking the way you thought when the problems were created.

~ Albert Einstein

Acknowledgements

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First of all, I would like to thank the graduation committee for their time and comments. Secondly, I'd like to thank those who allowed me to interview them. Also my gratitude goes to the people in Ghana from IWMI, GLOWA and Small Reservoirs Project who took the time to inform me on the present situation, to drive me around, discuss with me the various issues at hand, and showing me various dam sites. Also, thanks to the students and faculty at Water Resource Management of Civil engineering, where I spent most of my time working behind one of their computers and drinking their coffee and tea And to those who have helped with lay-out and drawings.
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Executive Summary

"Freshwater is indispensable for human survival"; this was not only Ghana's theme for the International Year of Freshwater (2003), but also the key theme behind why there is a growing trend in Ghana to manage this vital resource with care. In an area such as the Upper East Region of Ghana, where the population lives with highly variable rainfall and experiences drought, catching and storing freshwater that falls as rain during the rainy-season is essential in order to live through the dry-season. The stored water can help bring security to the livelihoods of the people since it can be used for irrigation, domestic use, and livestock watering during a period where otherwise there would be very little water available.

However, the volume of water that becomes available for storage varies from year to year and therefore project such as the Small Reservoirs Project (SRP)[1] are working in the region to create methods for growing food with less water and to develop these small storage reservoirs. This thesis research was carried out for the SRP with the aim to answer the following question:

> **What kind of participatory approach will be most useful to a District Assembly to achieve sustainable development of small reservoir systems?**

A literature study and a field study were carried out in order to gain better understanding of the small reservoir systems and the institutional structures in the Upper East Region at the district and at the regional level that could allow for participation to take place, and an analysis of these structures was carried out. Because of the affiliation with the Small Reservoirs Project, this research also focused more on the most useful participatory approach that the SRP can help the District Assembly to achieve or implement.

In the first place, from looking at the evaluations of two projects that were carried out in the past it was determined that the most essential component to successful participation is creating a willingness, enthusiasm and commitment to participatory approaches both at local communities and within the supporting organisations. Commitment can be enhanced through use of incentives and through creating a mutual understanding and agreement as to what is to be done, why, and within which time span. However, It should be realized that capacity building and training activities take time to implement and that it also takes time before water users learn to become water managers.

Secondly it was uncovered that in order for the District Assembly to make informed decisions about development of small reservoir systems it would need information in the form of data (quantifiable and qualitative facts about characteristic of water resources), information (interpreted data), knowledge (information held in the mind) and wisdom (agreement and commonly accepted methods of using water resources to ensure sustainability). These types of information would be needed in order to understand:

- The physical aspects of the system (hydrology, geology, soils, etc);
- Possible water related problems that could be solved or arise due to development of the small reservoir systems (water-borne diseases, pollution, erosion, social disputes etc.);
- Possible technical solutions to aid in solving problems;
- Possible organisational solutions to aid in solving problems and realizing sustainable development;
- Managerial aspects of development (regulations, finances, etc.)

[1] Full name of the SRP: *Planning and evaluating ensembles of small, multi-purpose reservoirs for the improvement of smallholder livelihoods and food security: tools and procedures.*

In the third place, from a local level institutional analysis and a regional level institutional analysis it was determined that that the current institutional structures offer the District Assemblies three possibilities for participation to take place:

1. Public participation via the districts' Department of Agriculture
2. Public participation via the unit committees and area councils
3. Stakeholder participation in the form of the Water Resources Commission's proposed White Volta Basin management board.

Because the first approach is already being invested in by the International Fund on Agricultural Development (IFAD) via the LACOSREP[2] II project and because the second approach focuses on too broad information about development problems in the district in general and not more specifically water resources issues, it was determined that a *stakeholder participation in the form of White Volta Basin management board is the most useful of the three identified approaches for the Small Reservoirs Project to invest in, in order to assist District Assemblies in development of small reservoir systems.*

The board provides the opportunity for representatives of various stakeholders interested in water management in the region to combine their knowledge, experience and efforts in order to understand developments in the basin. For the District Assemblies, as well as for the SRP, such sharing of knowledge can be very useful in order to gain better understanding of the greater water system that is to be managed by receiving information about the problems others have faced in management of parts of the system and the problems that could be solved or could arise due to development of the system. An advantage is that the board has been proposed but has not yet been set-up; there is in fact still room for adjustments.

However, a number of weaknesses of and threats to the proposed set-up of the board were identified that could still be tackled and taken into account before the basin board is made operational. The main point of concern is that not necessarily all stakeholders who may have information, data, knowledge and wisdom in fields that are of importance for development of water resources are included in the proposed board. Furthermore, the coordination of the stakeholders and leadership by a chairman in shaping the project and generating a common view as of the nature of the problem is quiet essential in order for the board to work in an efficient and effective manner. Yet, no guidelines for such leadership appear to have been developed yet for the board, therefore the accountability of the board is questionable.

As a result, a number of recommendations for the Small Reservoirs Project, the District Assemblies of the Upper East Region and to those who are setting up the White Volta Basin Management board were given. In the first place, it is recommended that the Water Resource Commission consider a new set-up in which there would be a *daily board* that can be held accountable and is responsible for keeping records, keeping contacts with relevant stakeholders, scheduling meetings, coordinating that stakeholders work together and for making sure that work is being carried out and that information is being passed from stakeholder to stakeholder.

Besides this daily board, other members of the board would be advisory; forming sub-committees to carry out work in certain fields about which they are specialised, knowledgeable or can provide relevant background information, such as informing other stakeholders about land- and water-use rights, for example. This would mean that stakeholders that have relevant information for the development of water resources in the region are included, yet their inclusion is related to certain projects and does not mean that a board is to be made up of an uncountable number of members.

It is also recommended that in order for the board to be set up in such a manner, the Small Reservoirs Project, the District Assemblies and the Water Resource Commission work together in order to find a facilitator who can assist in this set-up. This facilitator should be someone ho has experience with leading such types of boards and preferably is NOT already involved in other aspects of water resource management in Ghana. This last is strictly because attention needs to

[2] Upper East Region Land Conservation and Smallholder Rehabilitation Project, phase 2

be paid to the set-up and functioning of the board and not necessarily the (self)-interest of the facilitator. It is possible that research institutes and donors can be asked to help find someone capable of filling this position, though this may be tricky considering what was written in the previous sentence.

However, no matter what set-up is eventually chosen, it is recommended that members of the board should be stimulated to become aware and remain involved in the activities of the board. This could be done through: regular excursions to create understanding of the water system or in order to see what others in the region are doing to manage water resources; setting up smaller goals within short time span enables achievements to be crossed-off, which stimulates members to work further towards achieving larger goals over loner periods of time; and monthly seminars during which various stakeholders present what information they have gathered and interpreted and applied.

And finally, the development of the institutional structure of the District Assemblies and the information-flows from the public to the DAs via the unit committees and area-councils need investment too. Though this may not be directly in the interest of the SRP, it is recommended that this be point of discussion within the basin board as well as being brought up by the DA's at meetings with other DA's and with sponsors in the region because this disfunctioning can affect the development of the region on a whole, which should ultimately also be of importance to all DA's and any research organisation wanting to support development.

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List of abbreviations

AEA	Agricultural Extension Agent (MoFA)
AMRC	Australian Mekong Resource Centre
CGIAR	Consultative Group on International Agricultural Research
DAs	District Assemblies (have legislative power)
DADO	District Agriculture Development Officer
DANIDA	Danish International Development Agency
DCD	District Co-ordinating Director
DCE	District Chief Executive
DCO	District Cooperative Officer
DDA	District Director of Agriculture
DDPO	District Development Planning Officer
DfiD	Department for International Development (UK)
DIDO	District Information and Database Officer
Dos	District Offices (of decentralised ministries)
EPA	Environmental Protection Agency
FAO	Food and Agriculture Organisation of the United Nations
GEF	Global Environment Facility
GIDA	Ghana Irrigation Development Authority
GVP	GLOWA Volta Project (the Global Change in the Hydrological Cycle Project)
GWP	Global Water Partnership
HDI	Human Development Index
HIPC	Highly Indebted Poor Countries Initiative
IFAD	International Fund for Agricultural Development
IFPRI	International Food Policy Research Institute
IIMI	International Irrigation Management Institute (HQ Sri Lanka)
IMF	International Monetary Fund
IPTRID	International Programme for Technology and Research in Irrigation and Drainage
IWMI	International Water Management Institute
IWRM	Integrated Water Resource Management
LACOSREP	Upper East Region Land Conservation and Smallholder Rehabilitation Project (in two phases)
MAPP	Mobilizing for Action through Planning and Partnerships
MDGs	Millennium Development Goals
MoFA	Ministry of Food and Agriculture
NALAG	National Association of Local Authorities of Ghana
NCWD	National Council on Women and Development
NEPAD	New Partnership for Africa's Development
NGO	Non-governmental organisation
OECD	Organisation for Economic Co-operation and Development
RBM	River Basin Management
PIP	Policies, Institutions and Policies
PRA	Participatory Rural Appraisal
SRP	Small Reservoirs Project

UER	Upper-East Region
UNDP	United Nations Development Programme
UNESCAP	United Nations Economic and Social Commission for Asia and the Pacific
WECD	World Commission for Environment and Development
WRI	Water Research Institute (Ghana)
WRC	Water Resource Commission (Ghana)
WUAs	Water User Associations
ZEF	Zentrum für Entwicklungsforschung of the University of Bonn, Germany

Part 1

Introduction

~ Reinout de Kraker

1 Background

"Freshwater is indispensable for human survival"; this was not only Ghana's theme for the International Year of Freshwater (2003), but also the key theme behind why there is a growing trend in Ghana to manage this vital resource with care. In an area such as the Upper East Region of Ghana, where the population lives with highly variable rainfall and experiences drought, catching and storing freshwater that falls as rain during the rainy-season is essential in order to live through the dry-season. The stored water can help bring security to the livelihoods of the people since it can be used for irrigation, domestic use, and livestock watering during a period where otherwise there would be very little water available.

However, the volume of water that becomes available for storage varies from year to year and therefore research organisations such as the Consultative Group on International Agricultural Research (CGIAR) have started programmes in order to create methods for growing food with less water. This means that water can be used more efficiently and so livelihoods can be more secured.

The CGIAR has set up a programme called the *Challenge Programme on Water & Food*, which focuses on creating research-based knowledge in order to uncover how to grow food with less water. (CGIAR website) Within this programme is the Small Reservoirs Project (SRP)[3] for which this master's thesis has been carried out. In the Small Reservoirs Project various institutes are working together to find ways to improve the planning process of construction and management of small reservoirs (storage places for water) in the Volta River basin, the Limpopo River basin and the Sao Francisco River basin during a time span of four years (see SRP website).

Part of the assignment received from the Small Reservoirs Project for this thesis was to analyse the information needs of the local governments (the Districts Assemblies) in the districts of the Upper East Region (UER) of Ghana and how these needs could be met, especially with respect to investments in small reservoirs. (SRP website>news, Feb. 2005) The Upper East Region (UER) lies within the (Red &) White Volta Basin, which is one of the four basins of the Volta River.

> NB: The Volta Basin is the largest of the 16 major river basins in Ghana. Figure 1-1 shows the Volta basin, its location in Ghana, the White Volta River basin, the UER and the districts that lie within the region.

If the information needs of the local decision-makers are not understood, then it may turn out that the data or information gathered by a project such as the Small Reservoirs Project is not "needed" or desired in order to make decisions. The gathered data could be interpreted in an unusable or incomprehensible manner for the decision-make, which may mean that gathered data/information is then not applied. This in turn may mean that resources applied (i.e. financial and human) to gather and interpret the data have then been wasted.

Thus, by understanding the institutional information needs concerning planning, operation and maintenance of small reservoirs, the SRP and the local decision-makers can work towards gathering relevant information in the fields of hydrology, economics, ecology and health needed for decision-making about small reservoir systems at the district level.

[3] Full name of the SRP: *Planning and evaluating ensembles of small, multi-purpose reservoirs for the improvement of smallholder livelihoods and food security: tools and procedures.*

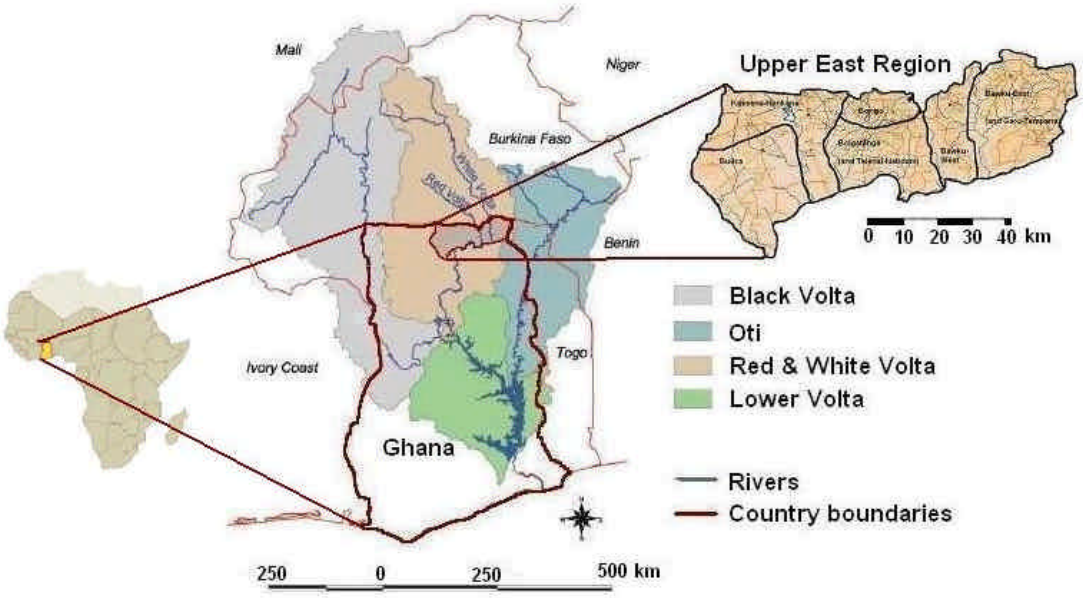


Figure 1-1: Africa, the Volta Basin, Ghana and location of UER there within (adapted from Liebe, 2002. p.88*)*

Further specification of the assignment from SRP was to focus mainly on the District Assemblies of three districts that lie within the Upper East Region and within the White Volta Basin; Kassena-Nankana, Bolgatanga and Bawku-West, see Figure 1-2.

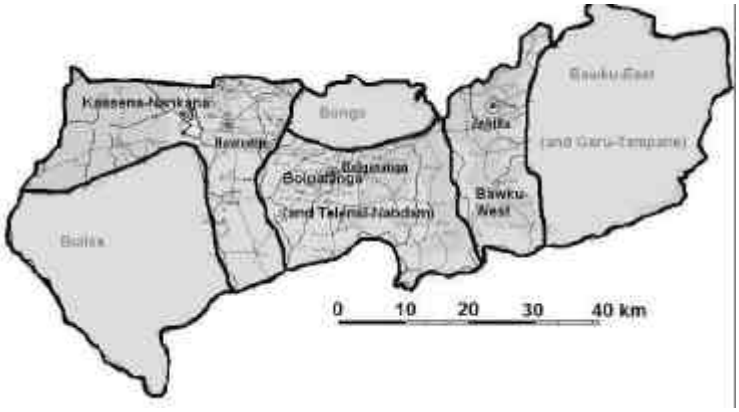


Figure 1-2: Districts in Upper East Region

The reason behind this specification was that partners of the SRP (such as the GLOWA-Volta project, see Appendix C) are already active in these districts. Due to this activity it would be easier to more clearly view what is going on in these districts in terms of research being carried out. The location of a guesthouse in Navrongo (Kassena-Nankana district), the fact that Bolgatanga is the region's capital and which lies in the similarly named district, and that the Regional Ministry of Agriculture recommended including Bawku-West were also determinant for the choice of districts.

1.1 White Volta Basin

The White Volta River finds its origin in Burkina Faso and runs through the UER before the Gambaga Escarpment forces it to the east, where it meets the Red Volta, the Tono and the Sisili

rivers before heading further south through West-Mamprusi District (which is in Ghana's Northern Region) and finally drains to the Lower (Main) Volta River.

In the past the White Volta River ran dry during the dry-season, however, due to regular water releases from the Bagre Reservoir in Burkina Faso, the river now runs year-round. This of course has caused changes in the ecology of the river and also in the manners in which the water is now used by the local population.

The basin is the site of many different projects such as the Ghanaian Water Resources Commissions' (WRC) Basin Pilot Project and the GLOWA-Volta research project (led by ZEF-Bonn), the latter aiming to assist the former in achieving sustainable water resource management in the entire Volta Basin, starting with the White Volta Basin. The main aim of the GLOWA-Volta project is the development of a Decision Support System (DSS) that will help the authorities in Ghana, Burkina Faso and the other riparian countries to optimise water allocation within the basin.

Also, another CGIAR Challenge Programme on Water & Food project is present in the region, the IFPRI/ZEF Integrating Governance and Modelling Project. The project's goal is to "improve the livelihoods of rural poor women and men through more productive and equitable water use by facilitating hydro-economic cooperation between nations sharing transboundary water resources in sub-Saharan Africa and beyond." The Small Reservoirs Project works closely together with the abovementioned projects, especially when it comes to small reservoir development in the Upper East Region.

1.2 Upper East Region

The Upper East Region covers an area of 8,842 km^2, which is approximately equal to 3,4% of Ghana's land mass and serves as the gateway to Ghana from Burkina Faso which is a traditional crossroads for the trans-Saharan trade route. An estimated 1,4 million people live in the UER (based on a 1998 estimate and an annual growth rate of 3%) leading to a mean population density close to 165 people per km^2, though one should realize that in rural areas the density is slightly lower than in more urban areas. However, 87% of the UER is rural.

The regional capital is Bolgatanga, which lies in the similarly named district. The local government system is made up of a Regional Co-ordinating Council, a four-tier Metropolitan and a three-tier Municipal/District Assemblies structure. The District Assemblies (DA) are either Metropolitan (population > 250,000), Municipal (population > 95,000) or District. (Ghanaweb, website). The Upper East Region has 8 districts; Builsa, Kassena-Nankana, Bongo, Bawku-West, Bawku-East, Talensi-Nabdam, Garu-Tempane and Bolgatanga. Please note that Talensi-Nabdam and Garu-Tempane have only been formed as of 2004, during the field study and from others it was not possible during this research to determine where their borders lie, though it is known in which "old" district they can be found.

The borders of the districts are roughly similar to the spread of the various ethnic groups found in the region: Kasem, Frafra, Buli, Kantosi, Tumulungu, Sisaala, and Mamprusi. Despite different ethnic groups the main religions practised in the region are Christianity and Islam; traditional religions are less commonly practised.

1.3 Why small reservoirs?

The Upper East lies within the Guinea Savannah Ecological Zone, which has such climate patterns that the people of the region live with highly variable rainfall, experience drought and floods. The zone is associated with a total annual rainfall of 1 000 – 1 300 mm/annum (Siaw, 2001. p.6), averaging to 1 044 mm/annum which is suitable for a single rainy season crop. Most rain, however, falls within three months (July-September). This short rainy season is marked by

many fluctuations in arrival time, duration and intensity of rainfall. Together with the poor water retention capacity of the soils, these fluctuations cause large inter-year variations in the agriculture production potential (IFAD website), which in turn lead to insecure livelihoods of the region's inhabitants.

Small reservoirs can provide an opportunity to deal with inter-year rainfall variation by providing storage for a significant quantity of water. This water can then be used during the dry-season for various activities. Furthermore, the small reservoirs have a significant effect on downstream flows since they provide a buffer so that floods are delayed and diminished because water can be (temporarily) stored (see Figure 1-3). This is necessary because the intensity of the rain can exceed the absorptive capacity of the soil, creating high amounts of runoff with erosion being one of the most significant agricultural constraints in the region.

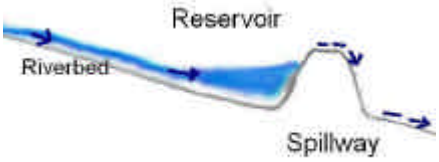


Figure 1-3: Small reservoir and spillway

The reservoirs are a widely used form of infrastructure in the Upper East Region for the provision of water mainly for irrigation and for livestock watering, fishing, and domestic-use. But also serve a purpose for wildlife watering, harbouring crocodiles, recreational purposes and for contracting purposes. Also, if the water levels in the reservoirs run low, the reservoir's bed can be exploited in order to make bricks out of the clay-rich soil.

Such array of uses of the reservoir and its water, does, however, sometimes lead to problems concerning maintenance, payment and ownership of the water and land surrounding the small reservoir. Another factor that leads to such problems is the movement of farmers away from the dry-season irrigation area during the rainy season, and their return to prepare the dry-season fields as soon as it becomes evident that rain-fed farming nearer to their homes becomes impossible. However there is often a lack of capital to buy proper inputs and for land preparation.

1.4 History of reservoir development in UER

At the moment there are approximately 160 small reservoirs (volume < 0,01 km^3, see Figure 1-4) in the Upper East Region. Most of these small reservoirs have been constructed in the past in a series of projects funded by different agencies in order to help bring security to the livelihoods of the people in the region.

Figure 1-4: Picture of a small reservoir in the Upper East Region (Small Reservoir Project website)

In the 1960s and 1970s various development cooperation organisations were involved in funding projects whereby dams were constructed in order to help rural communities in supplying sufficient water to meet their demand. However, not all systems remained functional, which engineers often based on a lack of experience and interest on behalf of the farmers to maintain the irrigation infrastructure.

During the 1980s, however, it was realised that the problems were not due to incompetent farmers per se, but were caused by the fact that the knowledge of the farmers had not been used and that local economic, social and cultural contexts had not been taken into account in designing the systems. As a result, organisations such as the World Bank, FAO and IIMI from the 1990s on started to invest in rehabilitation of the existing systems (Diemer, p.6) and in improving the planning, operation and maintenance of the systems.

The question remains why improvement in the planning, operation and maintenance of small reservoirs systems are desired to be achieved at all. What do development cooperation organisations and especially the SRP, envision to achieve through such improvement? The following chapter will deal with these questions in further detail.

2 Problem Description

This chapter describes in the first place why improvement in the planning, operation and maintenance of small reservoirs systems is desired to be achieved by development cooperation organisations and by the Small Reservoirs Project. Section 2.2 then describes the problem owner who is responsible for carrying out these improvements in the Upper East Region of Ghana, giving a reason as to why these improvements are a "problem" situation for this stakeholder. Furthermore, section 2.3 describes a manner in which it is though by the SRP that the improvements can be achieved and how this leads to research's problem statement which is further described in section 2.4. And finally, the delineation of the research is given.

2.1 Why improvement?

The history of small reservoir development and the fact that a significant number of small reservoirs are functioning sub-optimally and/or are falling into disrepair have motivated development cooperation organisations to want to improve the planning, operation and maintenance of small reservoirs systems in a "sustainable manner". Furthermore, improvement is desired in order to assist the region in:

1. Providing food security;
2. Providing environmental sustainability;
3. Improving the productivity of water (in crop, livestock and fisheries production systems and ecosystem services) within the basin.

The driving force behind the "want" for improvements comes from a growing willingness of international development cooperation organisations to invest in the African Water Sector via New Partnership for Africa's Development (NEPAD), for example. This willingness, in turn, stems from the agreement made by United Nations member-states in 2000 to work towards achieving the eight Millennium Development Goals (MDGs). Further background to these principles will be given in Chapter 0.

"The MDGs are used by the international development community as a common framework to guide its policies and programmes and to assess our effectiveness." (OECD website) The eight goals constitute an ambitious agenda to significantly improve the human condition by 2015, setting clear targets for reducing poverty, hunger, disease, illiteracy, environmental degradation, and discrimination against women. (Millennium Project website)

For small reservoir development the Small Reservoirs Project translates these targets into the following goals:

1. To ensure the long-term sustainability of local water supplies and adequate downstream flows;
2. Increasing the production of food;
3. Reducing poverty;
4. Ensuring human health;
5. Improving rural livelihoods by providing (easier/closer) access to water, and
6. To achieve positive economic effects (e.g. cost savings) obtained by merging companies or centralising individual operations.

(SRP Research Proposal as found on SRP website, 2004)

In order to achieve these targets the SRP aims to a) make (more) water available to smallholders in a "sustainable" manner and b) to generate and apply knowledge on how to manage trade-offs and promote synergies to enhance water productivity.

Through collaboration between decision-makers at the local, basin and national scale and local communities, the Small Reservoirs Project aims to improve methods for institutional, financial, and economic analyses and to build confidence in a science-based approach to planning reservoir systems. The information gathered via the analyses will enable the SRP to develop two purpose built sets of analytical tools and implementation procedures.

Furthermore, if the tools and procedures are based on a) sound economic and biophysical research and b) focused on individual reservoir management (SRP website), it is believed that they will assist decision-makers and stakeholders to properly site, build and manage small reservoirs and contribute to increasing rural livelihoods and pro-poor development. However, which stakeholder or decision-maker in the Upper East Region is actually responsible for the planning, operation and maintenance of the systems? Is it also in this stakeholder's interest to achieve improvement of planning, operation and management of small reservoir systems?

2.2 Problem owner

Management of water resources in the district is important in order to achieve overall development of the district since many economic and livelihood activities are based on use of water that comes from these reservoirs. In the Upper East Region, it is the District Assembly (DA) of each district that has to take the responsibility for the overall development of the district. The DA is the district's legislative power, meaning that it has to:

- Play a role in the formulation of the district composite budget;
- Mobilise and utilise human, physical and financial resources for economic and social development;
- Provide basic infrastructure municipal works and services;
- Develop and manage human settlements, maintaining security and public safety.

(The 1993 Local Government Act)

The districts and District Assemblies were created in 1988 as part of the Ghanaian government's decentralization program in which the responsibilities of 22 line ministries from central government were de-concentrated to the district level. This shift of responsibilities also means that the DA is responsible for formulation and execution of plans, programmes and strategies for the effective mobilization of the resources necessary for the overall development of the district (1992 Constitution).

Small reservoirs can contribute to the overall development of the district because they provide an opportunity for the district to deal with inter-year rainfall variation by providing storage for a significant quantity of water. The stored water can be used during the dry-season for irrigation, livestock watering and domestic use. Especially the first activity can aid the district in development because if local communities are given the opportunity to grow crops year-round, then they can sell the excess which is not needed for own consumption year-round. This means that the livelihoods of these people will become more stable because they will have a more constant food supply and receive some income during the entire year instead of only during the short rainy-season (which also implies that they do not necessarily have to leave the district during the dry-season in order to find work). It is therefore in the interest of the District Assemblies (on order to fulfil its responsibilities) to look at how planning, maintenance and operation of small reservoir systems can be improved and how to enable long-term use of such systems. However, in what manner can this improvement be achieved? The answer to the question will be handled in section 2.3.

2.3 Collaboration

One manner in which it is thought (by SRP) that planning, operation and maintenance of small reservoir systems can be improved in the Upper East Region is through communication and collaboration with the stakeholders involved in local and regional water management. Through collaboration information concerning the systems can be gathered and interpreted, which can then aid the District Assembly in making decisions concerning the small reservoirs. The idea of collaborating with stakeholders stems from one of the Dublin Principles (established at the 1992 International Conference on Water and the Environment), which states that "water development and management should be based on a participatory approach involving users, planners and policy makers at all levels." (Solanes, et al, 1999)

> NB: the Dublin Principles and the context in which they are further applicable to this research will be described further in section 3.2.

Approaches such as collaboration enable those interested in developing the small reservoirs (i.e. the DA and projects such as SRP) to uncover the farmers' and other small reservoir system users' knowledge and to take the social, cultural and economic contexts surrounding the systems more readily taken into account in designing the systems. This also implies that the dysfunction of the systems as discovered in the 1970s can be curbed.

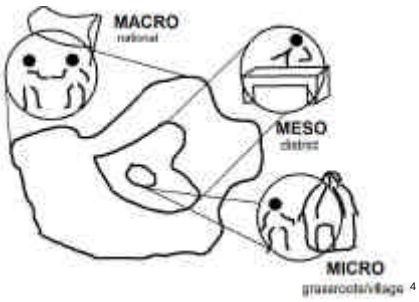
Webster's Dictionary gives the following definition of collaboration: *To work together, especially in a joint intellectual effort*. In development activities, this type of working-together is often defined as participation that can function as a sequence of negotiations among multiple stakeholders in analysing situations, developing problem definitions, finding alternative solutions and implementing those solutions. (Craps, M [Ed.] 2003)

Participation can take place at different levels; the macro, meso and micro (see Figure 2-1). Within these three levels different stakeholders can be identified who collaborate and negotiate with each other. When relating these levels to water management in the Upper East Region the following examples of participation can be given;

1. Since the White Volta River finds its origin in Burkina Faso, collaboration between this country and Ghana is necessary in order to manage the common water source. If transboundary cooperation (**macro**-level) does not take place then it is possible that the downstream country (Ghana) is negatively affected by decisions made by the upstream country (Burkina Faso).
2. At the **micro**-level various grassroots communities or villages could be in collaboration concerning a certain issue that affects them. Often these stakeholders have different interests as to why they should collaborate but are dependant on each other in order to reach their goals.

But what is more of interest for this research is participation that takes place at the **meso**-level since this is where one will find the District Assemblies. At this level the DA could be working together with other district stakeholders such as the public and private sector institutions, research institutes, NGOs etc. in order to provide basic infrastructure or agricultural inputs or to manage the water resources.

In a sense, participation within the levels such as the abovementioned examples can all be considered stakeholder participation since different stakeholders can participate with each other. However, from this point forward stakeholder participation in this thesis refers more specifically to participation that takes place at the meso-level. Further description of this stakeholder participation is given in section 3.3.



[4]

Figure 2-1: Levels at which participation can take place

Collaboration, however, does not have to take place only **within** the levels, it can also occur **across** the levels. A District Assembly (from the meso-level) could, for example, aim towards participation with the public (micro-level) in order to achieve feedback from the villagers on decisions that have affect on them. The involvement of citizens in governmental decision-making processes is defined by Mobilizing for Action through Planning and Partnerships, MAPP (see MAPP website) as public participation.

In summary, in order for the Small Reservoirs Project to achieve its goals, it, on the one hand, aims towards stimulating stakeholder participation in the form of collaboration between stakeholders such as decision-makers, research institutes, NGO's, etc. at the local, regional and national scale. On the other hand, it aims towards stimulating public participation via collaboration between decision-makers and local communities.

The District Assemblies could largely benefit from public participation in order to acquire information about and feedback on decisions concerning small reservoir systems from the villagers. This kind of information is important to take into account since the water users are largely dependant on the small reservoir systems for water during the dry-season. Knowing what they know and taking it into account during decision-making may ensure that decisions made will be more accepted by these people.

On the other hand, the DAs could also largely benefit from stakeholder participation in order to acquire, assimilate and apply existing knowledge and experiences from other DA's or from research institutes in the region and the basin. This knowledge and experience should concern issues that affect or influence small reservoir management, planning, operation and maintenance.

2.4 Problem Statement

Since the District Assembly could benefit from public participation as well as from stakeholder participation the question arises as to which participatory approach is most useful for a District Assembly in the Upper East Region to focus attention on at the moment in order to achieve improved planning, operation and maintenance in a sustainable manner? This has led to the problem statement of this research:

> **What kind of participatory approach will be most useful to a District Assembly to achieve sustainable development of small reservoir systems?**

It is hereby assumed that a participatory approach can assist the DA in achieving sustainable development, be it mainly because such an approach enables information concerning small reservoir systems to be gathered from various levels of society. However, in order to answer the problem statement one must consider:

- What tools/options are available to a DA in order to achieve participation?
- What kinds of approaches have been used in this area (or similar areas) in the past?

[4] After the cover of FAO Resource CD-ROM

- How do (or can) the past experiences relate to the present situation?
- What lessons can be learned from past experiences?

The SRP states “a sustained effort to plan and manage small reservoirs will have a positive impact […] if decision-makers have the information they require to make good decisions.” However;

- What are good decisions?
- What information does the DA require in order to make good decisions?
- Where (or with whom) can this needed information be found?
- In what manner can a participatory approach assist in finding this information?

Furthermore, once having uncovered what type of participatory approach could be useful to the development of small reservoir systems, and in order to answer the problem statement, the following questions are also to be explored:

- Who make(s) up the “community” that needs to participate?
- What issues can hinder or delay participation?

By answering these questions and by studying the community that is involved in participation, advice can be given as to what type of approach is most useful to the District Assembly for development of the small reservoir systems. However, in order for a project such as the Small Reservoirs Project to want to invest in such an approach, the decision-makers who are involved in this approach should also strive towards good governance. This is because development cooperation organisations worldwide are striving to achieve the Millennium Development goals by 2015. One of these goals (number eight) underlines the responsibility of developing countries to pursue poverty reduction and good governance. (OECD website)

Of course one could argue whether or not these development goals then are realistic and whether they fit in the social, cultural, traditional and possibly even the economic context of the studied region or country. However, what is realistic (or possibly real) is that at the moment governments of many African countries, including Ghana, are appealing to the Group of Eight (G8) rich nations, the International Monetary Fund and the World Bank to increase aid and debt relief in order to combat poverty and spur economic growth. (Ghana Homepage, June 2005) However, to receive this aid or debt relief the countries are required to show that they are taking steps to reduce poverty, increase governance and uphold human rights. (Youthink website) Though one could question whether debt relief is the “solution” since it is not always clear as to how these debts were built up, the fact of the matter is that governments *are* working (and want to work) towards better governance in order to receive increased aid and debt relief. Therefore instead of trying to stop them from doing so it may be more useful that projects work towards helping governments find the “best” manners in which they can achieve better governance. It is therefore also in interest of SRP and the District Assembly to understand how good governance could be achieved at the district and regional levels. One such step could be through information gathering via a participatory approach.

2.5 Delineation

This research cannot possibly look at all aspects that the Small Reservoirs Projects covers, so while the SRP looks at the Limpopo, Sao Francisco and the Volta Basins, this research will only cover a small part of the SRP project’s work in the Volta Basin. The small section that is covered is a selection of the districts that make up the White Volta Basin, namely the districts of Kassena-Nankana, Bawku-West and Bolgatanga.

Because of the affiliation with the Small Reservoirs Project, this research also focuses more on the most useful participatory approach, which the SRP can help the District Assembly to achieve or implement. This means that the fields of interest of the Small Reservoirs Project are also taken into account when making a selection.

Even though water management implies to look at all aspects of water in a region, the focus of this research will remain on dams and reservoirs for water provision since this is the focus of the Small Reservoirs Project. The reason that the SRP looks mainly at these dams and reservoirs is because these are the main sources of water for irrigation during the dry season, which is in turn the focus of the Challenge Programme on Water & Food.

In the Upper East Region there are also some larger dam and reservoir systems that are used for irrigation. These are, for example, the Tono and Vea schemes. These irrigation schemes, however, are not taken into account during this research. Instead when speaking of *small reservoirs* reference is made to reservoirs that have volumes less than 0,01 km^3.

Though a field study was carried out in the Upper East Region, it should be noted that information retrieved and especially the interpretation of the gathered information is marked by the fact that this research is being carried out in a developing African country by someone who is not from such a country. Even though an attempt was made to understand as much of social and cultural aspects as was possible in 6 weeks things may have been overlooked in the interpretation.

2.6 Report set-up

Most likely it has been noticed that the thesis has been split into 4 parts. The first part has just introduced the reader to the research, the area in which it takes place and the reason why there is a problem and by whom it is perceived as a problem. Part 2 describes the theoretical framework on which the thesis is built up and chapter 4 describes the methods that were used in order to carry out the research and to answer the sub-problem questions.

Part 3 gives the results of the analyses carried out during the research period. In chapter 5 of this part a study was done looking at participation whereby evaluations of two projects, the “People’s Participation Program” (1994) and “The 50 Well Project” (1988), were looked at in order to determine what lessons could be learned from the past experiences. Also, pitfalls to participation were identified as well as alternatives and tools to participation. Chapter 6 shows what type of information is needed by the decision maker in order to make informed decisions about the planning, operation, maintenance and management of the small reservoir systems.

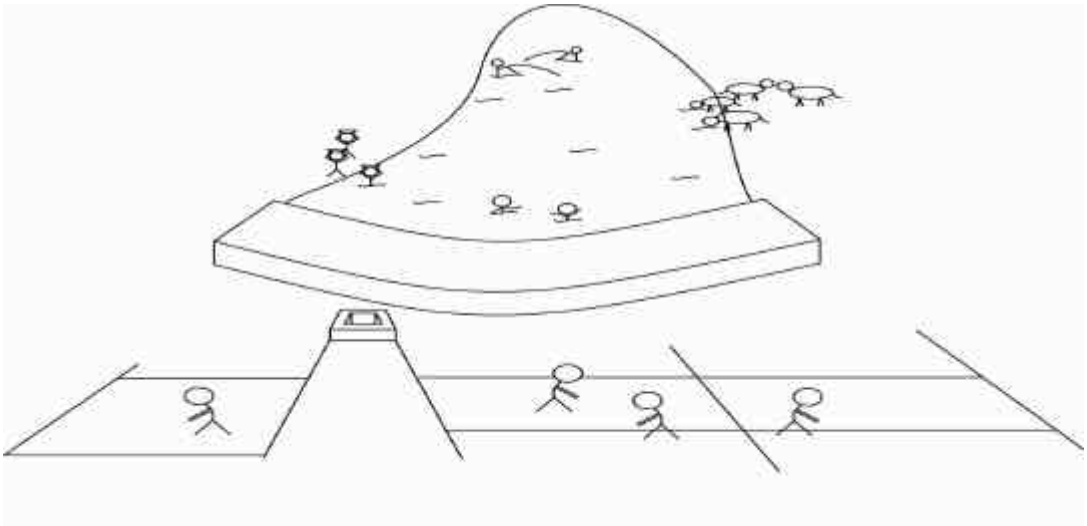
For those interested in further understanding of the small reservoirs systems as necessary for this research, one is referred to Chapter 7, and for those interested more in the institutional structures that offer possibilities for the District Assemblies to stimulate and implement participation are described in chapter 8 (local level institutions), chapter 9 for a brief intermezzo which offer a brief glance at the stakeholders involved in water resource management at the national scale and chapter 9, which describes more in detail the institutional structure through which stakeholder participation at regional level can be possible.

And to round off this part of the research, chapter 11 gives an impression of the types of dilemmas that the District Assemblies and the development organisations (such as SRP) could be faced with during implementation of the participatory approaches described at local and regional level.

The information and analyses described in part 3 lead to Conclusions and Recommendations which are explained in part 4. Also, at the end of the thesis a brief reflection on the research is given. This reflection may give an idea as to what was learned from this research and how things might have been done differently.

Part 2

Methodology



~ Sanneke van Well

3 Theoretical Framework

By being active in developing countries, the Small Reservoirs Project has committed itself to helping achieve a number of goals that are associated with development in and of those countries, such as achieving sustainable development and so also to assist in achieving the Millennium Development Goals. Development as described with these goals requires sustainable development of the environment as well social and political sustainability.

This chapter describes the theories of sustainable development (section 3.1) and how it leads to the principles that lie within integrated water resource management (IWRM) on the one hand, see section 3.2. On the other hand, sustainable development also leads developing countries and the development organisations (or donor countries) who assist them in development to pursue and work towards achieving good governance (see section 3.3).

3.1 Sustainable Development

Sustainable development is a dynamic and evolving concept with many dimensions and interpretations. It reflects locally relevant and culturally appropriate visions for a world[5] in which development "meets the needs of the present generation without compromising the ability of future generations to meet their own needs." (World Commission on Environment and Development, 1987 p. 43)

Because of the nature of the Small Reservoirs Project and its goals, sustainable development in this thesis refers to finding manners in which water and agricultural needs of the present generation of water-users can be met without compromising the ability of future generations to meet their own needs. Hereby the “greatest challenge” is to make decisions and design policies though which food and environmental security can be provided and ensured.

Furthermore, decisions made now concerning these reservoir systems should be made in such a manner so that in 30 years time there is no need for another research team that is faced with identical problems as those that the SRP is facing now. Decisions and policies should therefore, be designed and implemented so that they are successful in the short -, but especially in the long-term. That is why the manners in which food and environmental security can be provided should reflect the locally relevant and culturally appropriate visions of development. After all, because the social, cultural and traditional contexts were not taken into account during design of the small reservoir systems in the past many are now not functioning as they should.

The Millennium Development Goals (adopted by UN member-states in 2000) provide a pathway to attaining sustainable development since they focus on social aspects and policy coherence and integration. (OECD website) In the first place this means that while a number of issues are to be tackled, implementation of solutions should realize that social, cultural and traditional aspects also play a role in how development can or cannot take place. Secondly, reference is made to the fact that policy should be coherent and integrated. This is further emphasized in goal eight of the MDGs which “underlines the shared responsibilities of developing countries to pursue poverty reduction and good governance and of developed countries to support the efforts of developing countries; by increasing aid, opening trade to exports from developing countries, and providing debt relief.” (OECD website) This means that further understanding of good governance is required, which is described in further detail in section 3.3.

However, projects such as the Small Reservoirs Projects are, in their attempt to assist in achieving the MDGs, looking at resource based development as one of the key issues in their

[5] UNESCO: “Framework for a Draft International Implementation Scheme” UN Decade of Education for Sustainable Development, July 2003

involvement in Ghana's Volta Basin, focusing especially on water as the resource. It is therefore also in the interest of the project to understand the principles behind Integrated Water Resource Management

3.2 Integrated Water Resources Management

Integrated Water Resource Management (IWRM) is based on the perception of water as

a. an integral part of the ecosystem,
b. a natural resource and
c. a social and economic commodity; the quantity and quality of which determines the nature of its utilisation. IWRM is a process that promotes the co-ordinated development and management of water, land and related resources, in order to maximise the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems. (GWP, 2000)

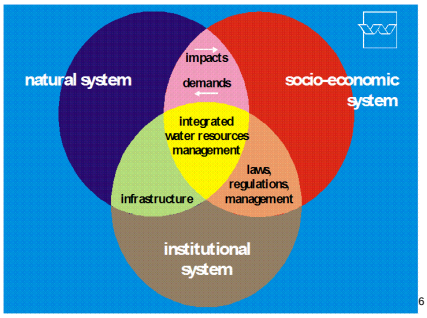


Figure 3-1: Integrated Water Resource Management Systems

Figure 3-1 shows how the natural system, the institutional system and the socio-economic systems are intertwined. This reflects how IWRM requires developing countries and those assisting them in achieving sustainable development of natural resources to focus not only on the natural resource, but also on the manner in which:

- this resource is affected by or affects the socio-economic system and,
- the institutional system can balance socio-economic interest with environmental interests.

Decisions made concerning the water resource should therefore be made with consideration to the consequences that they might have on each of the three systems. Alternatives should be explored and possible trade-offs made in order to determine the "best" manner in which to achieve sustainable development.

Furthermore, such requirement needs further specification through principles that lie in line with IWRM and sustainable development. Principles such as the Dublin principles or those of River Basin Management stress that better water management can be achieved through better understanding of the resource and the social system which makes use of it, on the one hand. On the other hand, better water management should be possible through sustainable development of the institutional system that is responsible for it. This also implies that the institution should strive towards achieving the 8 characteristics of good governance as best as possible.

i. Dublin Principles

The Dublin Statement and Conference Report provide a framework for water-related actions and serves as a "holistic, comprehensive and multi-disciplinary approach [to water resources

[6] sheets van Van Beek, 2004

problems worldwide].” (Solanes et al, 1999 p.1) The framework is based on four principles that cover social, political and economic issues at hand:

- Fresh water is a finite and vulnerable resource, essential to sustain life, development, and the environment …
- Water development and management should be based on a participatory approach, involving users, planners and policy makers at all levels ...
- Women play a central part of the provision, management and safeguarding of water …
- Water has an economic value in all its competing uses and should be recognised as an economic good … (Solanes et al, 1999)

These principles were established at the 1992 International Conference on Water and the Environment and now form a basis of the Millennium Development Goals. Just like the MDGs, the Dublin Principles are dynamic and should be adjusted accordingly to the situation wherein they are applied. To this extent, the principles also support the lessons given at the faculty of Technology, Policy and Management of the TU Delft, which often refer to the fact that theory is dependant on the situation in which one wants to apply it. During research, one should take the wishes, demands and capabilities of the different groups that are involved into account.

ii. River Basin Management

The ideas of including users, planners and policy(decision)-makers at all levels can be found in River Basin Management which has become increasingly concerned with bringing in stakeholders to key decision making processes.”(Website AMRC) Accordingly, dialogue within a river basin trends toward:

- Decentralized natural resource management
- Democratisation in various spheres of life
- Recognition of the failures of overly bureaucratic approaches
- Awareness of the knowledge potential of those who use and live most closely to the resources

Dialogue in a river basin context might be considered the interaction between different stakeholders to address specific problems related to competing interests and competing views on how basin resources should be used and managed. (Website AMRC) It is this dialogue what the SRP aims towards, in conjunction with development of tools that will enable and facilitate this communication.

Communication is of interest to enable interaction between various stakeholders and different decision-makers. The manner in which this interaction takes place, however, is inherent to the manner in which the decision-makers are organised. Goal eight of the Millennium Development Goals emphasises a shared responsibility to pursue good governance so that “corruption is minimized, the views of minorities are taken into account and that the voices of the most vulnerable in society are heard in decision-making.” (Website UNESCAP)

3.3 Good governance

In development literature the term “good governance” is being used more and more commonly. In the same manner that major donors and international financial institutions are increasingly basing their aid and loans on the condition that reforms will ensure sustainable development, reforms should now also ensure that governments are taking steps towards "good governance." (Website UNESCAP)

Many question marks can be placed as to the validity of development cooperation organisations demanding that good governance be achieved worldwide via 8 characteristics, which are

described below. These question marks highlight that the (most often western) development organisations demand from developing countries that they take steps to reach goals that have proven to be very difficult to achieve also in "developed" countries.

However, since governments of developing countries such as Ghana have decided to participate in programmes such as the "Highly Indebted Poor Countries Initiative" (HIPC),[7] they have already pledged to take steps towards changes that encourage sustainable economic growth to help reduce poverty. Such reforms could include *introducing sound macro-economic policies, creating a sound legal system, establishing a reliable and accountable financial system. Detailed plans are formulated to improve the access and quality of public services and to improve the quality of life for the poor*. (Youthink Website) When the pledged reforms are achieved the countries should receive debt relief from the International Monetary Fund, the World Bank and the G8. Once the pledge has been made, governments have already committed themselves and it may be more useful for other development organisations or projects to assist them in achieving their pledged reforms rather than to "fight against" the goals that lie at the foundation of these pledges.

The definition of governance is; exercise of authority; a method or system of government or management. (Webster's dictionary, 1996) To uncover what this method or system looks like, an analysis is required which looks at those who are involved in the process of governing, those who are governed and those who can assist in governing, and then studies the manner in which they interact. However, once the analysis is carried out, how does one determine if the governing body can be seen as practicing "good governance"?

i. 8 characteristics

According to the United Nations Economical and Social Commission for Asia and the Pacific (UNESCAP) good governance can be determined based on 8 characteristics. The characteristics of a "good" governing body are that it be participatory, consensus oriented, accountable, transparent, responsive, effective and efficient, equitable and inclusive and that it follows the rule of law. This can be reflected in the following octagonal structure (see Figure 3-2):

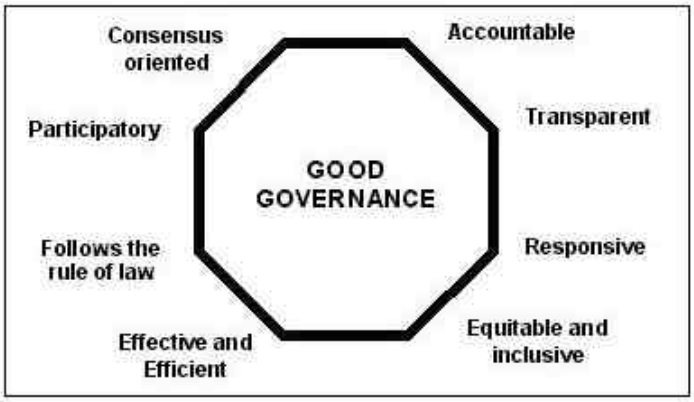


Figure 3-2: Characteristics of Good Governance (UNESCAP)

In other words, the characteristics point towards a governing system that:

- Includes representation of all of society's members (especially the most vulnerable members) and which represents their different interests and aims to reach a broad consensus within society,
- Sets up a fair legal framework,
- Protects human rights, allowing for free and understandable information flows,

[7] HIPC: The HIPC Initiative was first launched in 1996 by the IMF and World Bank, with the aim of ensuring that no poor country faces a debt burden it cannot manage. (see also the IMF website)

- Will be able to be held accountable for its actions,
- Aims to ensure that its results will meet the needs of the society while making the best use of the resources that are available to it (thus; aim towards sustainable development).

Communication is key because without a communication strategy and infrastructure it would be impossible for a decision-maker such as the District Assembly to gain the information needed in order to ensure that the governing system can achieve the 5 abovementioned points.

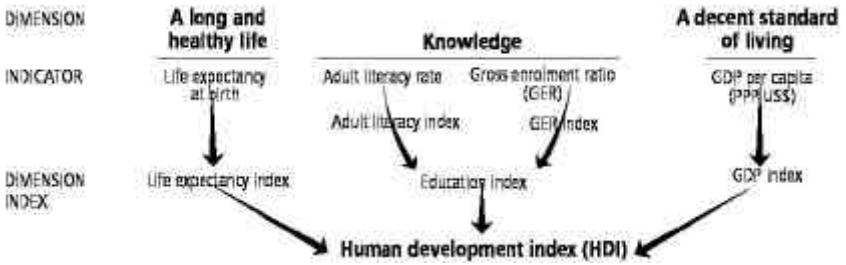
ii. Measuring good governance

Actually measuring good governance requires the use of "good governance indicators." Such indicators are use to measure:

- **Performance**: these indicators are evaluative, and indicate how a the quality of governance of a governing body rates with respect to, for example, corruption levels; (Indicators of governance and institutional quality, World Bank website)
- **Process**: these indicators are descriptive of the "institutional inputs that produce governance outcomes". An example of such an indicator is the average pay of a civil servant, relative to the private sector or to per capita income. (World Bank website)

Over the years many different type of indicators have been developed over the years and many different indexes and indicators have been used. For example, reference is made by the World Bank public sector to Kaufmann, Kraay and Zoido-Lobaton (1999a, 1999b) who had constructed six aggregate indexes from numerous indicators collected from 14 different sources, including the ICRG (International Country Risk Guide) indicators, indicators from the Business Environmental Risk Intelligence (BERI), Freedom House and others. Such indicators, however, are based on a certain quality of governance that has already been "predetermined". This is a weakness, however, because such quality is subjective.[8]

Instead, descriptive (process) indicators may be a better option, since they relate a measurement to relative factors. For example, if the cost of living is low then the pay of a civil servant in that country can be justifiably lower than there where the cost of living is higher. This example does, however, require information to be available concerning the standard and cost of living. Such indicators can be found in, for example, the Human Development Index "HDI" designed by the United Nations Development Programme to reflect "the condition of an average person in a country." (Human development reports website) Figure 3-3 shows the HDI is constructed out of various indicators.



[9]

Figure 3-3: Calculating the Human Development Index

The advantage of such an index (and indicators) is that it emphasizes that "people and their capabilities should be the ultimate criteria for assessing the development of a country, not economic growth." (HDR Office website)

[8] http://www1.worldbank.org/publicsector/indicators.htm#User's%20Guide, retrieved march 2005.
[9] Human Development Report, 2004. p. 260 (Technical Note 1)

The disadvantage, however, of such indicators is that they have been calculated for countries in general, and most often not for only regions of the country. This is unfortunate, especially in the case of the Upper East Region, since this region is far more rural than the southern part of the country and most likely has different levels of literacy, life expectancy and GDP. The average of the county thus does not accurately reflect the situation in the north (and respectively most likely also not in the south).

3.4 Participation

In the Agenda for Development of the Secretary General of the United Nations (1997) under point 176, participation is considered: “an essential component of successful and lasting development. It contributes to equity by involving people living in poverty and other groups in planning and implementation. Participatory decision-making, together with the rule of law, democracy, and transparent and accountable governance and administration in all sectors of society is an important requirement for the effectiveness of development policies.”

Through participation a decision-maker can acquire, gather, collect, distribute and share information concerning that which is to be developed (such as a small reservoir system). This includes information about the system that is to be developed itself, about how development of the system affects or may affect the natural, socio-economic and institutional systems (as described in IWRM), as well as information about possible alternatives as to how development can or should take place in a sustainable manner.

According to Peter Harold (Country Director of the World Bank in Ghana in 2001) the effort at entrenching and increasing participatory processes must therefore begin with building the capacity of the institutions of Government and organisations of civil society to:

- Understand the issues at stake;
- Value these issues as desirable in the process of nation-building and,
- Increase their commitment to engage in collaborative ways towards addressing the issues of social and public accountability. (Gariba and Abdul-Nashiru, 2002. p. 7)

These propositions as to the increasing of participation in the decision-making process arise from two assumptions. The first is that the process can be improved through the inclusion of the different perspectives and knowledge that would otherwise go missing. The second is that support for the adopted policies would be stronger if the stakeholders or public would be better informed and have better access to the decision-making process, which would increase their understanding. (Mumpower, J.L., 2001, p. 67)

In section 2.3 an introduction was given to two forms of participation each defining a “community” that is involved in participation at that level:

- Public participation, in which citizens (and more specifically for small reservoir development, the water users) are involved in governmental decision-making processes and,
- Stakeholder participation, wherein DAs could be working together with other district stakeholders such as the public and private sector institutions, research institutes, NGOs etc. in order to provide basic infrastructure or agricultural inputs or to manage the water resources.

They will be expanded on in the following paragraphs, keeping in mind the problem statement of this research which aims to uncover which type of participatory approach will be most useful to the District Assemblies to achieve sustainable development of small reservoir systems in the Upper East Region of Ghana.

i. Public Participation

According to the International Association for Public Participation (IAP2) there are 5 different forms of public participation, through which a decision-maker can achieve certain goals. They are to: inform, consult, involve, collaborate and/or empower the public (see Figure 3-4). These forms are given in the following spectrum whereby the level of public impact increases from left to right. The extent to which the public is involved can be dependant on the kind of information that a decision-makers feels it needs to acquire from or give to the public in order to make informed decisions and to give information about these decisions.

INFORM	CONSULT	INVOLVE	COLLABORATE	EMPOWER
Goal:	Goal:	Goal:	Goal:	Goal:
To provide the public with balanced and objective information to assist them in understanding the problems, alternatives and/or solutions.	To obtain public feedback on analysis, alternatives and/or decisions.	To work directly with the public throughout the process to ensure that public issues and concerns are understood and considered.	To partner with the public in each aspect of the decision including the development of alternatives and indication of the preferred solution	To place final decision-making in the hands of the public.
Promise:	Promise:	Promise:	Promise:	Promise:
We will keep you informed	We will keep you informed, listen to and acknowledge concerns and provide feedback on how input influenced the decision.	We will work with you to ensure that your concerns and issues are directly reflected on the alternatives developed and provide feedback on how input influenced the decision.	We will look to you for direct advice and innovation in formulating solutions and incorporate your advice and recommendations into the decisions to the maximum extent possible.	We will implement what you decide.

Figure 3-4: IAP2's Public Participation Spectrum

Within this spectrum the decision-maker (such as the District Assembly) determines which goal it wants to reach or can achieve and should set-up its plan of action towards including the public accordingly. By doing so the local government uses public participation to develop a more transparent government process that is sufficiently open to citizens' participation in the decision-making process. (OECD, October 2002)

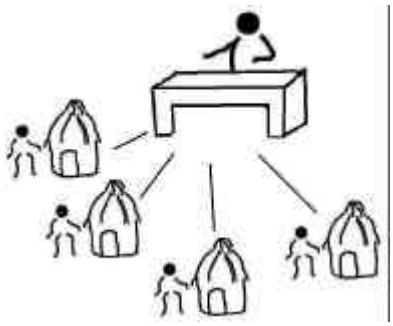


Figure 3-5: Public participation community

The District Assemblies could largely benefit from public participation in order to achieve information about and feedback from the water users on decisions concerning small reservoir systems. This is depicted in Figure 3-5, where the people next to the houses are the public, and the person behind the desk represents the District Assembly who "collects" information from and also distributes it to the public. This does, however, mean that at least consultation with the public is necessary, because through only informing the water users the DA will not acquire any relevant information *from* the water users.

ii. Stakeholder Participation

Involvement of the public in the decision-making process is not the only concern of a District Assembly when trying to make decisions concerning water management. There are also various private and public stakeholders without whom the DA cannot fulfil its tasks since they possess knowledge and information (or the means to gather it) that could be useful to the DA in order to make informed decisions.

This *select* set of stakeholders can be public or private advisory committees, research institutes, regulatory bodies, donor organisations and/ or service institutes who (could) work together with the DA on specific issues, such as those concerning water management in the district or in the region. These stakeholders also need the District Assembly since the DA is the legislative power through which activities in the district can take place. Such interdependence is one characteristic of networks as defined by de Bruijn and ten Heuvelhof. (1999. p. 30) Figure 3-6 represents that network of stakeholders, where the person behind the desk not only represents the various District Assemblies in the region but also the other meso-level stakeholders

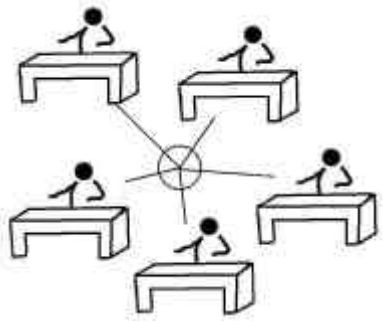


Figure 3-6: Stakeholder participation community

What kind of stakeholder network does a District Assembly in the UER find itself in? For water management this would ideally be one where the District Assembly meets and works together with the various stakeholders in order to address the water management related problems at hand. These could be other DAs, water research institutes, regional water managers, regulatory bodies, interest groups (traditional authorities, environmental organisations, agricultural organisations, women's organisations) etc. Each stakeholder wants something from the other in order reach a number of goals concerning water management and the relevant context surrounding the water source, realizing that their tasks can no longer be fulfilled alone and that problems also cannot be solved alone. (Koppenjan and Klijn, 2004. p. 3)

Similarly, Creech and Willard (2001, p.1) value the potential of "networks to foster changes in policy and practice, supportive of sustainable development, beyond what any single institution would be able to accomplish." This value comes from the possibility of network members to combine their knowledge, experience and efforts in order to have a greater and more sound-based impact on policies and programmes. This is then also why such a network can be referred to as a knowledge network, with the aim to:

- Increase stakeholders' *ability to acquire, assimilate and apply existing knowledge and experiences,*
- Work together to understand developments in the region or field and to change policies and programmes in order to achieve sustainable development,
- Promote a communications infrastructure that *provides a means for members to share experiences and draw on each other's strengths, expertise, and skills,*

(GNESD[10] website)

[10] Global Network for Energy on Sustainable Development

However, in order to make use of the network's potential, attention must be paid to the network's structure, work plans, timelines, deadlines, monitoring and internal evaluation. The network needs a manager, whose task it is to ensure that the work plan is being implemented. Furthermore, the formation of a network should not be seen as a single project, but requires regular attention and support.

The District Assemblies could largely benefit from stakeholder participation in order to acquire, assimilate and apply existing knowledge and experiences from other DA's or from research institutes in the region and the basin. This knowledge and experience should concern issues that affect or influence small reservoir management, planning, operation and maintenance and water management issues in general in the basin or region.

Nonetheless, the different interests and goals of the various stakeholders may imply that there are different perceptions of what the water management problem may be and how it can be solved. Participation in the network is therefore not only a question of acquiring, assimilating and learning how to apply existing knowledge and experiences from others, but also a question of finding out how to actually work together to reach a common goal.

3.5 Conclusions

In the above paragraphs the theoretical basis of this master's research has been given. With these in mind the research has been conducted in the search to find the "most useful participatory approach that can aid the District Assembly to achieve sustainable development of small reservoir systems." The following chapter will describe the methods that were used and the steps that were taken to conduct the research.

4 Methods

This chapter will cover the methods and techniques that were used in the course of the thesis research in order to answer the problem statement and to answer the sub questions stated in the problem description. Activities that have taken place in Delft, such as the literature study, will be described as well as the activities undertaken during the 6 week field study. The last few months of the thesis research were spent arranging the received information and uncovering in which manner this information could best lead to a number of conclusions and recommendations.

4.1 Literature study

Before going to Ghana a draw-up was made of possible stakeholders involved in Water Resource Management in the region. This draw up was made based on information that could be found via the Ghanaian Government (website, documents etc.) and on the analyses of others who have looked more closely at the social structure of the Upper East Region and from whom I had received documents. Also, a day was spent at the Zentrum für Entwicklungsforschung (ZEF) of the University of Bonn, Germany talking with Dr. S. Engel, Osman Gyasi and Wolfram Laube who were working on projects that look at institutions involved in natural resource management in Ghana. This information, along with advice given, was used as background and as an orientation as to what to “expect” or to be aware of during the field study.

Furthermore, a study was done as to what types of project are at the moment being carried out in the region and also in the country. From this study it became clear that there are various large (and often well known) organisations working on or which have worked on projects that look at participation of the public in order to reach certain development goals. Not all projects were directly relevant to my research, but reading about them brought more insight as to the issues that are being tackled; such as empowering women, increasing access to sanitation and drinking water, increasing livelihoods through improved fishing and irrigation/farming, reducing deforestation and desertification, protection of wildlife, etc.

From this study a further study was done concerning participation; to uncover what has been done in Ghana in the past concerning participation and what has happened in other countries over the world in this field. An initial search was carried out via the internet, looking at sites of development co operations and donors such the World Bank, the Food and Agriculture Organisation of the United Nations (FAO), the United Nations Development Programme, the Global Water Partnership, etc., resulted in finding many different types of projects carried out that include “participation” in some way or another.

Thus, the decision was made to search for documents that gave a reflection and evaluation as to how participation was implemented in developing countries and how successful it “appeared” to be. A number of these documents were found via internet sites of the abovementioned organisations and others such as the International Institute for Sustainable Development (IISD) and the International Association for Public Participation, but also via the libraries. However, of all those projects that were mentioned, few of them had taken place in Ghana and even less had been evaluated, which was deemed important in order to learn lessons from them which would be applicable to this thesis research. However, two *were* found; the “People’s Participation Program” (1994) and “The 50 Well Project” (1988).

Also, not all information gathered from the articles, reports and books was used directly; however, the World Bank’s Participation Sourcebook and good practice notes found in the document “The World Bank and Participation” of the world Banks Operations Policy Department, 1994, were valuable sources for identifying the pitfalls of participation as described in section 5.2. As well as the information from the FAO’s Participation CD-ROM.

4.2 Field study

During the 6 weeks spent in Ghana semi-structured interviews were held in the Upper East Region and in Accra, the country's capital. The aim of these interviews was to receive information concerning how water resources in general are managed in the UER and how water resources such as small reservoirs are managed and have been managed. Through the former information it was possible to identify the present institutional structures through which participation could be achieved at the local level as well as at the regional level. The latter information was to provide background as to what has happened in the past and why past actions failed or were successful. However, this last type of information was difficult to find and therefore is not directly mentioned in the research.

Time was also spent talking to representatives from the Water Resources Commission, the World Bank, the Ghana Irrigation Development Authority and the Regional Ministry of Food and Agriculture to gain information as to the various projects being carried out in the country that concern water resources and irrigation at all levels. This too was done in order to get a better feel for what had happened and is happening concerning water management in general, and if possible, more specifically of course, concerning small reservoir development.

While in the Upper East Region, more specific information concerning the District Assemblies was gathered via the District Assembly officers such as the District Chief Executive, the co-ordinating director, the cooperative officer, the budget officer and development planning officer. The names of those who were interviewed can be found in Appendix B. Information concerning the regional level institutions that would enable water management to take place was gathered from the Water Resources Commission and from a number of informal discussions with people from Small Reservoirs Project and the GLOWA-Volta Project.

Also, research was done as to achieve a better understanding of the small reservoir systems. Some information was gained via interviews with the directors of Agriculture at the districts' departments of Agriculture via the deputy director. However, a better understanding was achieved through site visits. Mr. E. Dalaba, the District Director of Agriculture of Kassena-Nankana gave me the opportunity to "follow" a training given to the Water User Association of Paga-Nania. This training was given by the District Cooperative Officer who gave an impression of how such trainings were organised and how they were carried out. Mr. Dalaba also allowed me to join a field trip whereby farmers from Paga-Nania went to Goo in order to discuss with other farmers why certain things were being done as they were.

By spending time at the Toende and Tanga dams in Bawku-West further information was gathered to gain an understanding of the properties of the reservoir structures, the water uses and of the environmental properties that influence the reservoir system. These all determine the volume of water that could reach the reservoir, the volume that could be stored and the volume that is desired to be stored in the reservoir. One will find this information especially in chapter 7, the System Description.

Through observation a number of social, cultural and traditional aspects were also "discovered" or rather experienced. Though these are not necessarily made explicit in the research because they were not directly linkable to what was written in the previous chapters, however, the chapter serves as an outlet for indicating dilemmas that are also of importance especially to organisations such as the Small Reservoirs Project to understand the "problems" that a decision-maker could be faced with when wanting to implement or take part in a participatory approach. Also, for the District Assembly the dilemmas may also be of importance to understand that, for example, donor assistance also brings with it a number of negative aspects that may not be at all desirable.

4.3 How to achieve good governance

As described in the Theoretical Framework, various indicators and indexes are generally used in order to measure if steps towards good governance are being taken. However, since these indicators often are based on statistics gathered for the entire country and not for specific region such as the Upper East, these indicators were not used to measure or compare whether or not good governance is to be achieved via implementation of a participatory approach. Instead, indicators as to which steps should be undertaken in order to be able to indicate that good governance is underway will be described.

Analyses were done especially on the institutional structures that deemed useful for the Small Reservoirs Project to invest in, in order to assist the District Assemblies with development of small reservoirs system. A number of strengths and weaknesses of these structures and a number of threats and opportunities that development of such institutional structures had for participation were identified, these can be found in the SWOT (strength, weakness, opportunities and threats) analyses in the appendices. It was then determined in what manner strengths and weaknesses could be utilised and in which manner the threats and opportunities could help lead to achieving the 8 characteristics of good governance. One should note that the implementation of a participatory approach to some extent already implies that the “participation” characteristic of good governance is being worked on. The question as to by whom good governance is to be achieved is dependant on whether the approach should be implemented at the district level or at the regional level in the form of a stakeholder approach such as a basin management board. It is however, in interest of the District Assembly, being the local decision-maker and the most influential governing body in drawing up development plans and carrying them out, that any participation activity in which the DA is involved show in some way that it steps are being taken towards achieving good governance and the Millennium Development Goals.

Part 3:

Analyses

5 Participation

Participation has a long history, relating to public involvement in early democratic movements. The authorities of empires, kingdoms and countries across the world and through time have included and still include forms of citizen involvement and even shared power by the citizens in decision-making.

In development activities, however, participation was not always obvious. For example, in the 1960s development organisations had not consulted the farmers in the Upper East Region when designing the small reservoirs systems. Local economic, social and cultural contexts were too easily by-passed in the design and planning phases, which is considered a cause for the malfunctioning of a number of small reservoir systems since their design and construction.

Now, however, participation is seen as an essential component of successful and lasting development (Agenda for Development of the United Nations Secretary General, 1997). As a result it is high on the agenda of international development organisations and as well as of national and local governments across the globe.

Yet, the term “participation” does not only make reference to the involvement of citizens, but also to the involvement of other stakeholders who have interests in development of a village, a region or a country in the decision-making process. When it comes to development of small water reservoirs in the Upper East Region of Ghana, focus is then on participation from the local farmer who uses the water from the small reservoir as well as on participation from decision-makers (District Assemblies) and stakeholders from across the region in order to achieve improved water management.

Before describing the institutional structures present at the small reservoir systems and in the region that may allow for participation, this chapter will discuss a number of lessons that have been learned from past attempts to implement participation in Ghana. Also, it describes a number of pitfalls that a decision-maker should be aware of when wanting to implement participatory approaches (section 5.2) and what other type of approaches a decision-maker could implement otherwise (section 5.3). Furthermore, section 5.4 gives an introduction to the tools that are available to stimulate participation and the chapter concludes with the conclusions in section 5.5.

5.1 Participation in Ghana

Examples of how participatory approaches were applied in other countries across the world have been published by organisations such as the World Bank in its Participation Sourcebook (1996) or the Food and Agriculture Organisation of the UN (FAO, 2001). This section describes two examples of participatory approaches that have been implemented in Ghana. These are, the “People’s Participation Program” (1994) and “The 50 Well Project” (1988).

The reason for choosing these examples is firstly because they take place in Ghana and secondly because they have been evaluated. Furthermore, the first project was chosen because it gives an indication of how application of tools that are developed by western organisations in a western setting do not always lead to desirable application in non-western situations such as in Ghana. The second example was chosen because it indicates that cultural aspects in the Upper East of Ghana cannot be changed easily; even though implemented policies during a project seem to be successful, later evaluation shows that this is not always the case.

i. People’s Participation Programme

In early 1982 the Food and Agriculture Organisation (FAO) of the United Nations established the People’s Participation Programme (PPP) Project in Ghana based on recommendations of the

World Conference on Agrarian Reform and Rural Development (held in 1979 in Rome) that called on greater participation of the rural people in their own development. (Muller, 1994)

The PPP project in Ghana established a number of pilot projects which were to promote the "formation of small, self-help groups that would allow members to develop income-generating activities (IGAs), receive services from other development agencies, and serve as a voice for dealing with local authorities," with a credit component that would distribute income based on performance of members. (Miller, 1994 p. 1)

In 1994 a post-project study, *People's Participation in Ghana: A post-project study of sustainability*, was published in which a number of lessons learned were described. The main lessons are as follows:

- The credit component, which was originally designed in Rome by FAO officials, severely limited the ability of local individuals and organisations to participate in the project design and resulted in a credit component that was inappropriate for the local conditions.
- From a cost effectiveness perspective, however, many development professionals familiar with the project felt that the PPP development approach was a relatively expensive and ineffective methodology. This general perception was the single largest factor limiting the project's replication and institutionalisation.
- Quite a number of the self-help groups "failed." This was often due to lack of incentive to continue the group once credit incentive had "disappeared" with the ending of the project. Many PPP self-help group members remarked that since the project had failed to meet its commitment to continue supplying credit, they did not feel obligated to continue the activities required to receive that credit such as organising and holding group meetings and developing IGAs;
- The development of groups at the farms did not foster long-term sustainability. The traditional organization of agricultural labour in Ghana is individual, not communal. While individuals have traditionally worked together on each other's farms, individuals still control their own land and harvest;

Furthermore, the paper reflects that the programme's success was dependent more on the enthusiasm and commitment of the group promoters (thus from the FAO) than on the participants. This enthusiasm and commitment was often lacking due to lack of accountability between the FAO and implementing NGOs and between NGOs and project participants, as well as due tot fact that the project actually covered a short scheduled life span that forced project activities to focus toward the less important objectives of the project, such as the paper-work involved.

As a result the paper emphasizes that participation from the local people should not be considered a goal on its own, but rather a means of producing locally recognizable benefits.

ii. The 50 Well Project

In July 1988, "The 50 Well Project" (also known as the Bolgatanga Community Water Supply and Sanitation Pilot Project) was started by the Ghana Water & Sewage Corporation, the United Nations Development Programme/ World Bank (UNDP/WB) Water and Sanitation programme, and some local authorities which included the Department of Community Development, Environmental Health Division of the Ministry of Health, Department of Social Welfare. (Yanore, 1995. p.190)

The project was carried out in order to see whether or not communities in Bolgatanga were willing (and able) to take responsibility for managing their water supply and sanitation systems. The objective was to transfer management of water and sanitation to the communities. The project was set up in 1988 and in 1995 the success and failures were assessed.

From the research done, Yanore (1995, p. 192) concluded that:

- “Sustainable community management hinges on capacity building of the water committee which also depends on resources, time and the effort put on extension work.”
- “Consultation and joint decision making, where roles and rights are agreed upon with the communities as partners generally provide more realistic solutions to sustained self interest in management”;
- “Sustainable community management is easily realized where the community and their selected committee members have common self motivation factor. Without that factor, awareness creation through trainings is usually a process of many, many years.”
- Communities were relatively reluctant to raise funds in order to carry out preventive maintenance, but more willing if major intervention was needed.

As it turned out, investing in capacity building for decision-makers as well as for water committees and water users was more important than initially thought. For this to succeed, however, self-confidence and self-motivation was needed as well as support from outside. But when wanting to invest in training and self-confidence building a project should realize that it takes time in order for communities to become water managers rather than only users of the water systems.

iii. Conclusions

These evaluations show that even though after the development co-operation organisations had become more aware of the necessity to involve the public in design of development “strategies,” mistakes were still made and it was proven that efforts to involve the public could still be unsuccessful. Also, it is shown that not only should the public be involved but also the committees, trainers and decision-makers in order to ensure the sustainability of the project’s work and results; once the project has officially come to an end, there is a need for a group to keep stimulating that activities take place. However, in order for these groups to continue stimulating the activities, time (and money) should be spent *during* the project to support their development and training so that they have the basic skills needed to carry out work independently from the project.

Both project evaluations come to the conclusion that even though community involvement and management have bottlenecks, they are probably the only known sustainable activities and arrangement for ensuring development in the rural areas of Ghana. One could argue whether this is truly the case; maybe regulation enforcement and a strict regime could show to be better in order to ensure a constant water supply. Trying this out, however, is not realistic and it is also not realistic that the government in Ghana would consider this type of experimentation. Especially not since it has indicated its willingness to work towards achieving the millennium development goals, which focus on transparency, fairness, and accountability of governance (as mentioned in section 2.4).

Though the projects were carried 10 to 20 years ago, the context in which the projects and their assessments took place is still relevant to understand how to involve community members of the Upper East Region today. The reason for this is that cultural and traditional aspects play such an important role in the region that it takes a long time for things to change. Though local communities easily adapt to having radios and cellular telephones (when enough money is available), aspects of social, cultural and traditional life are more imbedded and take longer to adjust or change.

5.2 Pitfalls of participation

May be the lessons learned from the two previous examples are not new to a local decision-maker such as the District Assembly. Rather, they could be of more use to the institutions that are willing to support the DA in stimulating participation in order to achieve improved development.

However, what may be then of more interest for a decision-maker is to understand the disadvantages that a participatory approach brings with it.

The following pitfalls were identified based on the World Bank's Participation Sourcebook, 1996 (which described what type of projects were implemented in the past and what the Bank has learned from participation), the document written by The World Bank Operations Policy Department "The World Bank and Participation" (1994), as well as on the FAO's Resource CD-ROM "Participation: Sharing our resources" (2004) and the field study carried out the Upper East Region during February and March of 2005.

- Partaking in participation may be seen as an activity that should always be compensated (financially, for example) since it asks them to spend time that could otherwise be spent doing other activities; (FAO CD-ROM, 2004)
- Organisations envision that participation will stimulate the "community" as a whole to work towards maximizing benefits, however, such visions underestimate the effect and perceptions of the individual; (FAO, 2001)
- Participation can be hampered by local hierarchies, different ethnic groups with difference in interests and negotiating power between users;
- Participation brings with it the risk of generating or aggravating conflicts between stakeholders of different priorities and interests; (World Bank, 1994)
- Local people may see participation as a threat because foreigners are involving themselves in local issues. This may lead to difficult negotiations, which defeat the purpose of promoting increased participation; (World Bank, 1996)
- Passive stakeholders, the silent majority for example, may not be taken into account during participatory approaches while the active ones always are. This may mean that some important information is not acquired.

Responsibility for participation is often laid at the local governments (World Bank, 1996), such the District Assembly (DA). This means that in order for participation to be sustainable the DA must remain involved in keeping it going or let it go when the set-up appears to be able to sustain itself. However, during the field study various sources have indicated that there is in some cases a lack of resources, capabilities, means and capacity to carry out participation at local governments. Donors could assist in funding and training.

Yet, donor assistance does bring a number of disadvantages with it. For example, funding is generally temporary and often requires that sustainability be achieved within a relatively short period. Such short-sightedness and short-term thinking, however, go directly against the ideas of sustainability. Instead, targets should be set realistically (by donors as well as District Assemblies) to fit the funding time-limit, even if this means that maybe not all steps needed to achieve "full sustainability" can be taken during the course of one project. Rather, different projects may have to elaborate on steps taken before. The risk here, however, is that none of the donors or projects feel (or can be held) responsible for the complete carry-through needed to ensure sustainability. Therefore, it is up to the District Assembly to work towards ensuring that projects build up on past projects. This means that the DA has to also work towards achieving its own development, and not solely rely on activities undertaken by others.

Furthermore, it is also useful for the District Assembly to understand that not all supporting organisations and agencies can carry out similar types of projects. For example, as was indicated from the field study, technically oriented agencies do not always have participatory-minded staff, and participatory-minded agencies do not always have the technical knowledge in order to teach the public or decision-makers about the technical possibilities to solving solutions. It is therefore of interest to the DA to find technically oriented organisations as well as participatory-minded agencies to inform and advise them as to how development could take place.

5.3 Alternatives to participation

If there are so many pitfalls to participation, why would a District Assembly want to implement a participatory approach? There are other approaches that it could adopt in order to reach development of the small reservoir systems. For example; a top-down approach, a mixed approach or an incremental approach (Bonfiglioli, 1997, after Midgeley,1988).

The advantage of a **top-down approach** could be that it aims towards achieving immediate and concrete results, such as the construction of dams or other infrastructure. However, this approach is most like the approach towards reservoir development taken in the 1960s and which has proven not to be sustainable.

A **mixed approach** combines certain aspects of participatory approaches with a top-down approach. So on the one hand participation is to be implemented as well as reaching a number of concrete and (predetermined) goals and results. On the other hand however, the approach could use "certain tools and techniques of popular participation, but only for the ulterior purpose of serving pre-defined official political and economic goals" Bonfiglioli (1997).

> NB: When working in developing countries one should be aware that a mixed approach can occur (most often unintentionally) because decision-makers do not always have the understanding of what a participatory approach truly entails nor do they have the means (human an financial resources) to carry such an approach out. Terminology may then appear to be used in order to ensure donor involvement and (financial) support.

An **incremental approach** includes undertaking activities as they are raised or requested by stakeholders. The advantage of this approach is that not too many activities run at the same time and mainly are tackled when they arise. Such steps may be useful to carry out construction once the design of the small reservoirs has been agreed upon by all stakeholders, but it is not a desirable approach in order to learn what stakeholders want, know or how they can or will participate in development. During development of the small reservoirs many activities will need to take place simultaneously in order to gain sufficient knowledge and information about the system, about possible effects of the system and about possible solutions to problems

However, supporting or donor countries and organisations have, through development assistance guidelines (take the Millennium Development Goals as an example), basically required decision-makers to carry out a **step-by-step participatory approach** since it takes into consideration the difficulties of integrating participation and involving the communities in the development process (Bonfiglioli, 1997). Various steps are therefore taken simultaneously in different aspects of that which is to be developed in order to deal with these difficulties. This then means that the District Assembly has to work closely with the stakeholders of the participating community and has to work towards capacity building of all stakeholders using knowledge and skills from the various stakeholders to do so.

5.4 Tools to participation

So, if the District Assemblies are "required" to take a step-by-step approach, there are numerous methods and tools available to the District Assembly in order to achieve participatory development in such a manner. These tools and methods have been identified by organisations such as the World Bank (Participation Sourcebook, 1996) and the FAO (CD-ROM, 2004). The International Association for Public Participation (IAP2 website) also has a Tool Box for practitioners specifically focused on public participation tools. These tools and methods range from *activity matrices* which help inventory who does what in a community to workshop-based methods such as *objectives-oriented project planning* which ask stakeholders to set priorities and plan for implementation and monitoring.

Choosing which of the tools and methods are desirable to use (for any type of participation) depends on:

- The purpose and application for which the tool is to be used (i.e. to get an idea of a social, physical, or economic profile, or for planning, for monitoring or for a collection of these activities);
- With which focus they are to be applied (i.e. as training, for communication, or for research);
- During which phases of a *project* they are envisioned to be used;
- The envisioned degree of participation (see as example the participation spectrum in section 3.4);
- The scope of action (micro, meso, or macro).[11]

Depending on the abovementioned points, certain tools and methods that are defined by the World Bank of FAO or IAP2 may or may not be of use for the DA at different stages of decision-making. There is also a difference between the tools and methods that are applicable if the DA wants information from the public or if the DA is one stakeholder in a stakeholder network. From literature it was discovered that various tools[12] have been applied in Ghana in the past, however since they have not been evaluated (or the evaluation cannot be found) it is difficult to determine their success. However, taking the abovementioned pitfalls to participation into account may help in application of whichever tool is to be chosen to be of use for stimulating participation.

At the moment a number of tools are being applied in the Upper East Region relevant to development of small reservoir systems. For example, the district's Department of Agriculture and the District Assemblies are working together with the International Fund for Agricultural Development (IFAD) to train water user associations via community workshops and field trips to other irrigation sites in the districts (at least in Kassena-Nankana District).

The goal of this training is that the Water User Associations will become self-reliant and in the future can manage themselves and deal with water issues concerning the small reservoir systems (see chapter 8 for more detailed description). It is through these associations and the Agricultural Extension Agents that the District Assembly can acquire (and distribute) information concerning the small reservoirs from the water users (public).

A method or approach that is (planned to be) applied for stakeholder participation in the Upper East Region is the proposed set-up of a White Volta Basin management board. It is envisioned that through this board District Assemblies, research institutes, regulatory bodies, and service providers at the district level can convene and exchange information, expertise, wisdom and knowledge in order to develop a better understanding of Integrated Water Resource Management and to develop action plans that will improve water management in the basin. See chapter 9 for further description of this management board.

5.5 Conclusions

In summary, from the projects carried out in the past and the evaluation thereof, it can be determined that the most essential component to successful participation is creating a willingness, enthusiasm and commitment to participatory approaches both at local communities and within the supporting organisations. Commitment can be enhanced through use of incentives and through creating a mutual understanding and agreement as to what is to be done, why, and within which time span. It should be realized that capacity building and training activities take time to implement and that it also takes time before water users learn to become water managers.

Despite the pitfalls, participation at various levels is still desirable for a District Assembly, be it via a step-by-step approach because it helps ensure that development of systems such as the small reservoirs is successful and lasting by covering/ dealing with different aspects of development step by step. Thereby, consultation and joint decision-making with those who are affected by different aspects of development generally provide more realistic solutions to sustained self-

[11] FAO, Participation CD-ROM, 2004.
[12] Such as a practice-research engagement approach (Gariba, 2002) or a town meeting held in Navrongo (Papa Sene, 2003).

interest in management. (50 Well Project) By creating ownership amongst the stakeholders and an understanding of the system that is to be developed, development will less likely come to an end as projects are “completed” and instead continue as stakeholders remain involved in developing the system.

However, what is it that the stakeholders and public are to participate about? Also, before making a selection as to the type of tool or method to apply the District Assembly should find out what kind of information it would “need” in order to make informed decisions, who has this information and in what manner this person or persons can best be approached in order to gather the information (NB: this could be through use of participatory approach). Also, it is of interest and importance to uncover what kind of (or which) stakeholder has the expertise to gather the information from the information-“holder.” In the following chapter these points and questions will be described in further detail.

6 Information

Integrated Water Resource Management principles, as referred to in chapter 0, require that decision-making concerning the development of water resources should be made with consideration to the consequences that these decisions might have on the natural, institutional and socio-economic systems that surround this resource. Alternatives should be explored and possible trade-offs made in order to determine the “best” manner in which to achieve sustainable development. The decision-maker (District Assembly) would therefore need to be well-informed in order to make decisions concerning development of the water resource, in this case the small reservoir systems. There are, however, a number of questions:

- What does this information include?
- Where or with whom can this information be found?
- In what manner can the information be gathered? (i.e. what apparatus needs to be set up, or how can an information “holder” be approached in order to gather the information)
- Who has the expertise to gather the information?”

The third question relates especially to the participation tools and methods that are possibly applicable in the situation at hand. And, when it comes to information gathering from a stakeholder, question 3 above also questions the manner in which a participatory approach can assist in finding or gathering this information.

Section 6.1 gives a brief description of the areas about which information is needed in order to make informed decisions concerning development of small reservoir systems in the Upper East Region. Section 6.2 then goes more into detail as to the type of information that can be acquired, while section 6.3 discusses the risks that a District Assembly should be aware of concerning the quality of information.

6.1 Areas about which information is needed

The reasoning behind wanting to develop the small reservoir systems in the Upper East Region has been indicated in section 2.1. But when interested in developing the systems and in order for the District Assembly to make informed decisions concerning that development, it needs to understand the *system that is to be developed.* Furthermore it would need information that aids in understanding the following areas;

- The problems that could possibly be solved through development of such systems,
- The problems that could arise due to development of such systems,
- The technical and institutional solutions that can aid in solving those problems and,
- The managerial aspects that are required in order to realize those solutions.[13]

Through understanding of these areas the decision-makers can identify more accurately who has the needed information, how it can be gathered and how it should or could possibly be acquired.

i. Small reservoir systems

In order to understand that which is to be developed (the small reservoir systems), information is needed on the hydrology of the systems (water cycles and quantities), about the geology in which the system can be found, on that which influences the water quality, on the effects of the system on ecology and the systems’ ecology. Understanding the system leads to the possibilities for identifying and determining how the system could be developed and understanding how development of one aspect of the system could influence another aspect.

[13] with information from the WES brochure

Furthermore, understanding how water flows into and out of the reservoir systems and how these flows affect the larger system (at a higher district or regional level) is required to prevent decision-makers from making decisions that may negatively affect the downstream population which may not lie within their interest group.

For example, during already heavy rainfalls in 1999, the spillway openings of the Bagre Dam (which lies in the White Volta River in Burkina Faso) had been opened to relieve pressure behind the dam. This action exacerbated the problems that the people of the Kassena-Nankana district were already experiencing due to the rains, causing many to be surprised by flash floods that were created due to the releases. If decision-makers had been more aware of the influence of water releases on those living down stream of the dam, maybe other measures would have been taken (or would have been taken earlier) to relieve the pressure behind the dam. (BBC website, 1999) As a result, however, of these floods, there are more regular releases from the dam, which also now means that the White Volta Rivers runs year round. (Learned during field study)

The abovementioned is an example of how transboundary decision-makers need to work together at the macro-scale, and need to be aware of the influence changes in their systems has on the downstream level. This is also needed at the local level. Especially if wanting to construct new reservoir systems or improve malfunctioning ones, decision-makers should realize what the downstream system looks like, what happens here and whether or not (re)construction affects (or will affect) these activities.

ii. Water related problems

Development of small reservoir systems could most likely solve a number of problems, but will most likely also bring a number of problems with it. For a District Assembly it is important to realize what problems could be solved, but also to realize what problems development and possible future construction of small reservoir systems could bring with it. The latter type of problems could range from water borne diseases and possible (flash) floods to social problems that arise as land ownership, land use and water use practices and rights are exercised. Erosion and sedimentation can also create problems and the affects of pollution and eutrophication need to be understood as well. These problems as well as a description of the reservoirs system will be given in Chapter 7, System Description.

iii. Technical and organisational solutions

There is an array of solutions that could be used in order to solve the problems that are related to development of small reservoirs. The most appropriate solutions, however, vary from place to place and are dependant on a wide range of circumstances (Kay 2001, p. 2) and can be found in traditional life or as modern solutions.

Solutions may range from those that “solve” or deal with erosion and sedimentation, with water shortages, flooding, over fishing, pollution and eutrophication to dealing with water related diseases, social problems, land use and spatial planning and land ownership. The solutions may include organisational structures that are used (traditional authorities, village structures or institutional structures of the District Assembly) or may include technical solutions in the form of old and new technologies. The institutional structures that at the moment are present at the district level and that are of direct importance for small reservoir development will be further elaborated upon in Chapter 8, while Chapter 9 looks at a possible institutional structure for water management in the Upper East Region. Analyses of both institutional structures will also look at the managerial aspects that a District Assembly (at district and regional level) has to be aware of knowledgeable about.

iv. Management aspects

Understanding of regulations, land and water rights and how this relates to social and traditional aspects of life in the Upper East region is necessary in order to make informed and sustainable decisions concerning reservoir systems and water resources in general. Realising solutions

(technical or organisational), however, also requires support from local, regional, national or foreign institutions or governments in the form of finances, education, and capacity building and communications investments. Also, the decision-maker has to find out which stakeholders (by name) can actually provide this kind of support, and in which manner.

The information gathered about the abovementioned area, however, also needs to be applied and collected in relevant action plans and needs to be set out in tasks. Doing so does require that the District Assembly has the means to do so, these means are in terms of capacity, financial capacity and institutional understanding of why plans need to be made and how to make sure tasks are carried out.

An important aspect to realise is that development of small reservoir schemes, as with many other smallholder schemes, takes a long time to develop; the process of improvement is often slow and incremental, usually in response to farmer demand. This may conflict with the specific and tight schedules and budgets of donors and supporting governments. (Kay, 2001. p. 34)

6.2 What kind of information?

Having described the areas within which information is to be gathered, the question is what kind of information there is to be gathered. According to the Global Water Partnership (2003, p. 141), information can be defined in 4 broad types of information which are needed for Integrated Water Resource Management:

- **Data:** quantifiable and qualitative facts about characteristic of water resources
- **Information:** interpreted data
- **Knowledge:** information held in the mind
- **Wisdom:** agreement and commonly accepted methods of using water resources to ensure sustainability.

Engineers, hydrologists, meteorologists, geologists, economists and supporting institutions through research, can for example, gather **data**. Such research may include field research where the data is gathered through use of relevant data gathering equipment, such as rain gauges to measure the rainfall, or by using devices such as a Parshall flume to measure the flow of water in an open channel. However, local community members may also have some (in their mind, based on experience and wisdom) of the relevant data. Such data, however, may most effectively then be gathered by international and local researchers who can then interpret it.

Data can also be gathered from the local people via interviews (structured or semi-structured) or through group meetings whereby specific topics concerning the relevant data are brought to discussion. Data can then, for example, be set out in economic, social, political, institutional physical, natural resources profiles (FAO, CD-ROM, 2004) that give an impression of the village or community.

International and local researchers who gather the data also have knowledge and wisdom that is based on experiences in other countries or regions. This can contribute greatly to defining possible technical and organisational solutions and in interpreting the data (for example that is set out in the profiles) so that the DA can use it to make informed decisions. Interpreted data becomes **information** for the DA.

Most **knowledge** and **wisdom** in the above mentioned areas could be found with those who have had experience with the system or area that is in question. For example, local community members and governments may be able to apply their (conventional) wisdom and knowledge in order to indicate what type of technical solutions have been implemented in the past, indicating why this was done, whether it was successful and the possible reasoning behind using such technologies or not. Engineers may be of use due to their experience and knowledge based on

past experiences and theory. From this perspective they too could indicate what technical solutions they see as plausible to implement in the specific situation.

6.3 Risks

A decision-maker should be aware of the fact that quality of the information received is essential in order to make well-informed decisions. However, it is possible that the interpreted information or the gathered data is questionable. For example:

- Quality of data does not meet requirements, it may be incomplete (some data are available), incorrect (information is wrong), missing (information is not available), inaccurate (accuracy is not high enough), inaccessible: (information available though not accessible);
- Data cannot be transformed (interpreted) into usable and requested information;
- Provided and requested information are unrelated;
- Discrepancy between the information that was requested and that is required.[14]

Koppenjan and Klijn (2004. p. 43-44) state; “Problem solving can fail as a result of insufficient information about the nature of the problem situation and the effects of solutions…” Therefore a DA must be aware of these potential risks; basing policies on inaccurate or false information may lead to greater problems as polices may not relate to the true situation.

But how can a District Assembly distinguish if information is of *good* or *bad*? One way would be for the DA to verify received information with other sources to see if they have received similar results. For example, experts (who weren’t the one who gathered the information) can give their advice about the validity or integrity of the received information.

Verification with other Districts Assemblies may also be of interest since they could be faced with similar problems or could have faced such problems earlier on. From the field study it was determined that the districts in the Upper East Region are, however, at different stages of their own institutional development. This would imply that some districts that are further ahead in their own development may also be further ahead in solving problems that a district could be faced with, also concerning water management or small reservoir development. The experiences that these DA’s have and the lessons that they learned may be of use to the lesser-developed DA’s. Chapter 9 will go into further detail about one possible institutional structure through which DA’s can share experiences and knowledge.

6.4 Conclusions

The information can be summarized in the following table to indicate what should be “known” about the different areas, what type of stakeholders can be useful in gathering and acquiring this information, and in what manner this is so.

Table 6-1:

Areas	Who can be useful?	In what manner?
Small reservoir systems - hydrology - geology, soils etc. - water quality and quantity - water cycles (also includes climate) - ecology	• Environmental specialists • Hydrologists • Meteorologists • Geologists	To gather data using equipment and to interpret data based on knowledge and education.
	• Water users • Local community members	Have knowledge and wisdom

[14] Lohman, 1999. p 3- 8.

Water related problems - water borne diseases - drought - floods - erosion and sedimentation - pollution and eutrophication - social problems - land use water use (disputes) - traditional aspects	• Environmental specialists • Health specialists	To gather and interpret data, and to give (possible) solutions and teaching and training.
	• Water users • Traditional chiefs and land lords	Have local knowledge and wisdom
Technical solutions (solutions for water related problems)	• Engineers	To gather and interpret data and to give possible solutions, teaching and training.
	• Planners	Have to carry out plans and use interpreted data to design and plan.
	• Local community members	Have local knowledge and wisdom on what was done in past
Organisational solutions (solutions for water related problems .. related to technical solutions)	• Local governments • Planners at various levels (international, regional, district, local)	Have knowledge on what was done in the past, have experience with local (regional and national) situations.
	• Local community members	Have knowledge and wisdom as to what has happened at system level in the past
	• Supporting institutions	For financial support, capacity building etc. Also have knowledge and experience that could be applicable.
Management aspects - regulations (land and water rights) - finances - education (local people) - organisational structure building - capacity building - communication	• Economists • Regulatory bodies • Governments, institutions or NGO's involved in local, regional or national water management	Can provide support based on experience and expertise. Support can (in the case of the last group) be financial or more specified to capacity building, for example.
	• Local community members	Know how traditionally certain land and water use issues (for example) have been handled in the past.

Also, each area could possibly achieve support from (other) governments or NGO organisations involved in environmental protection, nature conservation, sustainable development, water supply sector and agriculture.

A distinction is made between the people have the needed information or can gather, analyse and interpret it; the local people are the experts based often on experience and practice, while specialists such as hydrologists are experts based more on theoretical background and practice. Both types are useful for gathering, interpreting data and information that can assist the District Assembly in understanding the areas described. However, a District Assembly should be aware of the risks that are involved with using information that has been collected and interpreted by others.

Though a rough idea is sketched as to the type of persons needed, the question is who these stakeholders actually are in the Upper East Region and who then actually makes up the community involved in public participation and involved in stakeholder participation. That is why Chapter 8 will look into the local (at district level) institutional structures and Chapter 9 at a proposed regional institutional structure through which DA's can share experiences and knowledge and so will identify the actual stakeholders. But first, Chapter 7 will look more closely at the first two areas: small reservoir systems and water related problems.

7 System Description

In Africa, thousands of poor communities rely on small reservoirs for reliable water supply and improved food security. In the past efforts to small reservoir rehabilitation have not succeeded due to poor understanding of hydrology, lack of data and understanding of variability of water supplies in the dry *zone.* (SRP website) The Small Reservoirs Project is working on gathering this information in order to assist the decision-making process concerning planning, operation and maintenance of the small reservoirs.

A brief description of the dams, the history of their development and present reservoir development was given in Chapter 1. This chapter, however, aims to look more at the physical system in which the small reservoirs are found and what influences this system, whereby a number of water-related problems are identified. Also, a further description is given of the kind of information that a decision-maker would need about the system in order to make informed decisions concerning development of small reservoir systems in the UER.

Section 7.1 will describe the drainage system of the Upper East Region and the White Volta Basin and how the small reservoirs fit into this drainage system. In section 7.2 the types of dams that can be found at the small reservoirs are briefly explained. The factors that influence the volume of water that is available for irrigation will be described in section 7.3, while section 7.4 indicates for what other purposes water is needed.

7.1 Drainage System

The drainage system in which the small reservoirs of the Upper East Region can be found is characterised by the by inselbergs[15] of Birmian (birrimian) rocks or granite (EPA, 2000 p. 22) that can be found at 105 to 183 metres above sea level. The birmian rocks are generally covered by soils with low inherent fertility status and low potential productivity, according to a case study on semi-arid Ghana carried out for the University of Development Studies in Tamale (p.15). The low fertility status and potential productivity are, however, mainly due to the region's unfavourable moisture regime as a result of the erratic rainfall pattern; an average rainfall of 1 044 mm/ annum and an evaporation potential of around 1 700 mm/ annum. (FAO, Water resources database) This gives an indication that per year more water could evaporate than that precipitates, indicating also why the region is dry.

i. Stream order

Because of the region's Birmian underground the White Volta River's drainage forms a rather dendritic stakeholder (Knighton, 1998 p. 10, taken from Liebe, 2002 p.15). A dendritic stakeholder typically forms if there are homogenous rocks or flat lying sedimentary rocks (USGS website) and resembles the branching of a tree as shown in Figure 7-1, where a first order stream (labelled with number 1) doesn't have any tributaries and as the river increases in relative size its stream order increases. (NB. There are 12 orders given to rivers in the world, where the biggest is the Amazon River)

[15] An inselberg is a residual relief feature--an isolated hill, knob, ridge, or small mountain that rises abruptly, like an island, from a gently sloping or virtually level surrounding plain (inselberg is a German word meaning "island mountain". www.tec.army.mil/research/products/desert_guide/lsmsheet/lsinsel.htm

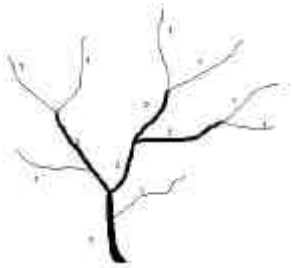


Figure 7-1: Strahler stream order representation

Liebe (2002, p.20) postulates that the lower in the hierarchy of a drainage stakeholder dam sites are located at, the smaller they are in area and volume, and the larger is their occurrence in number, and vice versa. In his research this appears to be the case also in the Upper East Region, where most small reservoirs are indeed located and number 1 order streams, which in turn gives an indication of the shape and volume of the reservoirs. The shape and volume is of importance to studying the hydrological “dimension” to which the SRP refers in her research proposal.

For this research this information is of importance to understand that the White Volta has the highest stream order in the region; its main sources of water being the rivers of lower orders in which many small reservoir systems can be found. Besides, it is also important to realize that since the small reservoirs serve as water storage, less water will flow through the White Volta during the rainy-season than originally (or naturally) was the case. In the dry-season it is possible that some of the water that leaves the small reservoirs reaches the White Volta, though it is more likely that this water leaves the system via the ground or evaporation before it can reach the White Volta River. Nonetheless, nowadays the river does flow year-round due to regular releases from the Bagre dam in Burkina Faso (developed mainly for irrigation and hydroelectric power).

ii. Run-off

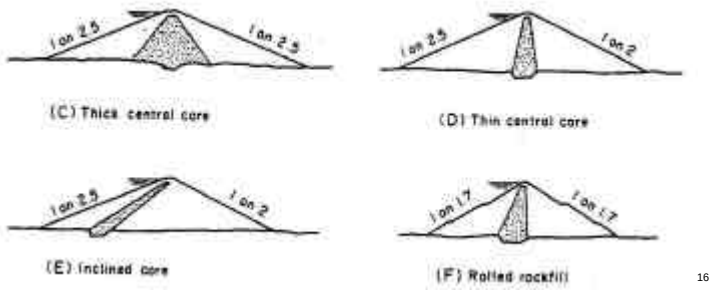
The amount of water that reaches the small reservoirs is the run-off, which is dependant on the absorptive capacity of the soil, the rain intensity and -duration and also on the vegetation in the catchment area. Not all of the run-off that pours into the reservoir will remain in the reservoir. If the run-off causes the height of the water in the reservoir to exceed the height of the spillway, water will pour from the reservoir through the spillway into the riverbed beyond the irrigable fields and (most likely) to the next small reservoir that is located down-stream (see Figure 7-2, though note that the distance between the two reservoirs can be quite large). The spillway’s construction should be so that it can handle the torrential run-off sufficiently so that the reservoir’s dam is not damaged by the overflow of excess water.

Figure 7-2: Cascade

Advantage of the reservoirs is that they provide a buffer so that floods could be delayed and smaller because water can be (temporarily) stored. However, since run-off does not flow freely through the riverbed anymore and water is stored instead, the recharging of the downstream soil moisture content is reduced. This low moisture content can exacerbate the erosive capacity of the water that does overtop the spill-way, considering that the velocity of this water is larger than it would be without a reservoir to hinder it.

7.2 Dam type

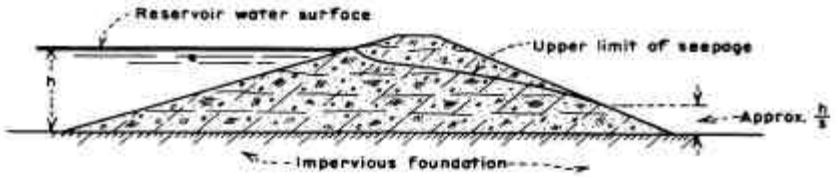
The dams in the Upper East Region are all earth fill dams. They can either be built up in layers of different types of materials (sand, clay, silt, rocks) or built up with different layers and have a relatively thin impervious core (see Figure 7-3) or be homogeneous (see Figure 7-4).



[16]

Figure 7-3: Earth dams with various impervious cores

The impervious core holds back the water and can made of various materials from a thin bitumen zone to a thick (wide) clay core. The dam is most often made up of sand and grit. An impervious core, however, does require protection of that zone; this can mean the use of filters between the core and the rough grained layers or protection against anything ranging from ants and termites to plant growth, wave attack and drying-out if the core is located on the slope of the dam (such as in E of Figure 7-3).



[17]

Figure 7-4: Homogenous earth dam

It is not always known what types the dams in the Upper East actually are since in many cases records of the old dams have not been kept at the locations (this of course does not apply if the dam has recently been rehabilitated). However, since the materials available in the region for dam construction are often clay-like soils it is quite likely that most dams are homogenous. This means that sufficient measures should be or should have been taken to ensure sufficient drainage. It also means that drainage water is seen at the downstream side of the dam, which was the case at a number of dam sites visited during the field study.

Water at the downstream-side of the dam can also point to leakage from the outlet works, which is not desired because it means that these works have not been protected or maintained sufficiently. The question here arises whether the losses through such leakages are small enough that they can be negated.

7.3 Water Availability

The amount of water that is available in the Upper East Region is dependant on the rainfall, the run-off and evaporation potential of the region as described above. During the dry-season, water can be found in the boreholes or wells, the small reservoirs and also in rivers such as the Red

[16] van Duivendijk, 2001 p.103
[17] van Duivendijk, 2001 p.104

and White Volta. These are then also the most important water “spots” to take into account for water management in the region in general. However, at this point focus is more on the small reservoir systems and the amount of water that is available to farmers for irrigation

The amount of water that is available to the farmers for irrigation is also dependant on run-off, rainfall and evaporation potential, but also on more specific properties such as;

- The reservoir capacity,
- The volume of water that leaves the system through the floor of the reservoir (infiltration), via evaporation and through the dam and its structures (seepage).
- The amount of water that is used for livestock watering and domestic use,
- The volume that should remain in the reservoir in order to maintain the fish and crocodiles, and

Figure 7-5 depicts the various water-flows into and out of the small reservoirs. The first two points can be determined by researchers (local or international) while most often information concerning the last two points can be gathered from the water users who have experience with such issues and know how much water livestock needs and is used for domestic use.

> NB: one should note that local knowledge might not always be expressed in terms of metric measures. The amount of water used for domestic use, for example, may be known by villagers in terms of number of basins filled per day. Information gatherers, however, can convert this to metric volumes if necessary.

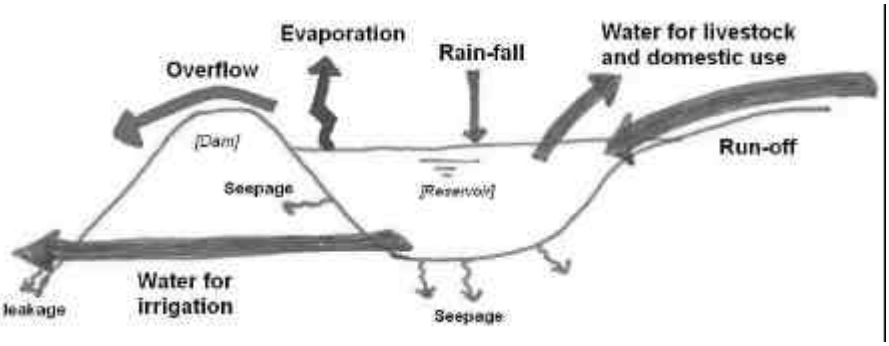


Figure 7-5: Water flows into and out of reservoir

Sakthivadivel et al, (1997, p.16) state two indicators that can be used to determine whether there is sufficient water supply. However, to apply these indicators it should be known what the effective runoff, the irrigation requirement and the storage capacity are.

- Water supply adequacy

  Effective runoff: R_o (= run-off, less spillway losses, less water releases into the environment and water released for other purposes)

  Irrigation requirement: I_t

  If $R_o / I_t > 1$ then enough water to meet irrigation requirements

- Storage capacity S_t

  If $S_t / I_t > 0,3$ this means that reservoir has capacity to hold at least 30 % of the irrigation requirement (farmers may indicate that a reservoir should have a capacity to hold a certain amount of weeks of irrigation requirement).

One should note that even though the reservoir was constructed with a certain storage capacity in mind, siltation may have (and most likely has) taken place. This will increasingly limit the volume of the reservoir over the years. Siltation may also lead to blockage of the outlet structure for irrigation and since the silt is gathered at the reservoirs, the fields below the reservoirs may be deprived from the sometimes nutrient-rich soil. Also, erosion of the catchment area may lead to

the build up of soil in the reservoir. This can be partially prevented by protection of the reservoir's catchment area by planting trees.

NB: Catchment protection is also important in order to maintain the quality of the reservoir's water.

7.4 Water needs

Water from the small reservoirs is used for irrigation and for livestock watering, fishing, and domestic use. These four will be further described in the paragraphs below. However, the small reservoirs can also serve a purpose for wildlife watering, for harbouring crocodiles (which is sometimes turned into a tourist attraction as at Paga in Kassena-Nankana), for recreational purposes (mainly swimming facilities for children, whether or not there are crocodiles present), and for business purposes (water for contracting purposes). Also, if the water levels in the reservoirs run low, the reservoir's bed can be exploited in order to make bricks out of the clay-rich soil.

i. Irrigation

The amount of water that is needed for irrigation (irrigation requirement) is dependant on the type of crops that are grown, the sizes of the plots in which they are grown and the number of plots that need to be irrigated. The latter is also related to the number of farmers that make use of the irrigable fields near the small reservoir.

How many farmers make use of the irrigable fields not only depends on the physical capacities and limitations of the reservoir (to provide enough water) or of the fields (fertility) but also on the organisational structure involved. From the field study in Kassena-Nankana and Bawku-West it became evident that the better the water users have organised themselves, the more users would join the irrigation scheme. This can, in some cases, put a strain on the physical capacities of the small reservoir system (water availability and land fertility) but well organised water user associations (WUAs, further explained in section 8.1) appear to be able to limit the number of farmers before it becomes critical. Of the crops that are grown during dry-season irrigation (such as tomatoes, peppers and onions) a portion is produced for own consumption, but generally the larger portion is produced for sale.

ii. Livestock Watering

Many farmers and also others living in the vicinity of the reservoirs own livestock according to their means (pigs, goats/sheep, poultry, cows, oxen, donkeys: most often free-range, except for some pigs), which rely on the water for drinking. To some extent the livestock also plays an important role in lives of villagers. Often they are the only "property" someone or a family may actually own themselves.

iii. Fishing

80% of the reservoirs are also used for fishing. Some fish exist in the reservoirs "naturally" but they may also have been placed there as part of a fishing scheme. For example, at Vea (located in the Bongo district) there is a fish hatchery which may supply a reservoir with fish if the water users association (WUA) or fishers' association of that reservoir can provide the funds for doing so and can indicate that there are measures taken to ensure that the fish population will be properly maintained.

In some cases the choice will be made to stop irrigation in order to allow for sufficient water levels in the reservoir for livestock watering and for maintenance of the fish population. (Mr. J. Apam, Toende, Bawku-West) This does mean that the farmers have to harvest what crops they can before water supply is stopped, which may imply that they have less crops to sell.

iv. Domestic Use

"Water for domestic use" most often does not refer to use as drinking water, but generally for washing, cleaning and cooking. Most drinking water is achieved from the various wells/boreholes that have been dug in and around the villages. However, one must realize that amount of water used for consumption is also based on the distance from a house to the nearest water pump and to the small reservoir. If the latter is further than the former, then there is a greater chance that water for consumption will be retrieved from the small reservoir.

7.5 Conclusions

The water-flows into and out of the small reservoir system are dependant on environmental factors as well as human interaction factors; this is depicted in Figure 7-6. These factors give an indication as to what should be "known" about the small reservoir systems in order to understand them and to make decisions concerning them.

The information concerning these factors can be determined through research where data is gathered using apparatus, but quite a lot of information can also be gathered from local community members (farmers, fishers, women who gather water for domestic use, livestock owners etc.) who have experience with and knowledge about what has happened in the past. Interpretation of the gathered information can be done by researchers, but should be verified by reservoir-user knowledge to see whether the interpretation is accurate for the circumstances.

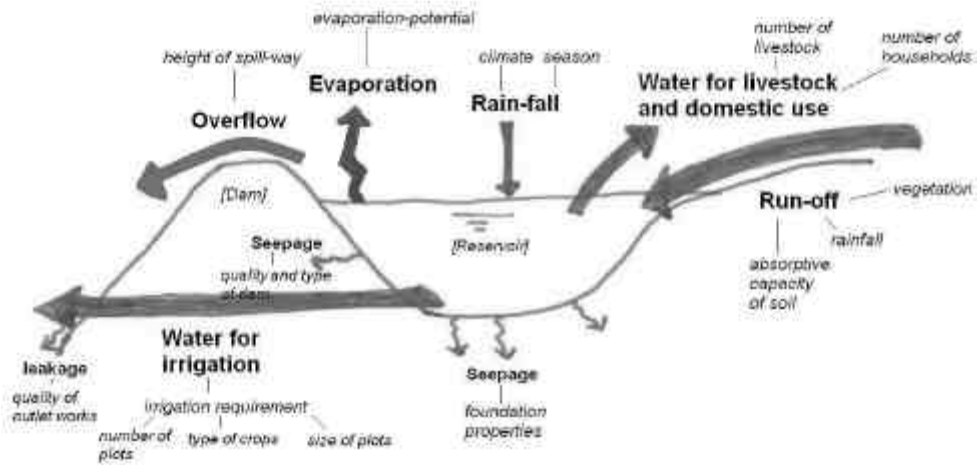


Figure 7-6: Factors that influence the reservoir's in- and out-flows

> Note that the qualities of the structures, though not indicated in the figure are also dependant on their initial construction and maintenance.

However, construction of dams does bring with it ecological and social changes. For example, in the ecosystem: water becomes available year round where traditionally it was not. This also means that the land surrounding the reservoir is more intensively used and that there is an increase in certain aquatic fauna and flora. Also, socio-economic changes will take place as the population around the dam increases and land tenure and ownership patterns are changed or even disrupted to allow everyone to make use of the irrigable fields. Furthermore, standing water brings with it an increase in waterborne disease such as in malaria and bilharzia. Because of these problems health specialists, environmental specialists (local and international) and those with knowledge on traditional and "modern" land use practices and on water and land rights are needed. The following chapter will look at the stakeholders present in the UER in order to uncover who is actually can receive the information concerning the small reservoir systems at the moment.

8 Local level institutional analysis

Koppenjan and Klijn argue that uncertainty for problem solving is not simply caused by lack of knowledge and information, but also by “the strategic and institutional features of the context in which these issues are articulated and dealt with” (2004, p.15) A general identification of those who *should* be involved in water management in the Upper East Region (and also more specifically for small reservoir development) was given in Chapter. 6.

This chapter more specifically gives an indication of institutional structures in which the stakeholders involved in management of the small water reservoirs in the Upper East Region at the local level can be found. This is based on an institutional analysis carried out during the field visit that included gathering the information from various members of the District Assemblies (see Appendix B for the list of names and functions).

An administrative and institutional analysis was carried out in order to determine which organisational structures are present in the districts of Kassena-Nankana, Bawku-West, and Bolgatanga through which information from the public can reach the District Assemblies. The public, who is dependant on the water that small reservoirs hold, is a valuable source of information as to how to plan, operate and maintain these systems.

The analysis can be seen as an inventory of tasks in acquiring information concerning issues related to management of small water reservoirs, showing which departments, organisations or people are involved. During the 6 week field study two parallel institutional structures were identified which enable information from the public concerning the problems they are faced with to reach the District Assembly via various sub-institutional bodies. One such structure is through the district’s Department of Agriculture, the other is via the representative bodies that are elected and appointed by the people and the local government.

8.1 Department of Agriculture

Information from the water users and concerning the small reservoirs can be acquired by a District Assembly via its department of Agriculture. The department came into being due to the decentralisation process in Ghana in 1988, which led to the handing down of responsibilities of the ministries to the District Assemblies. The responsibilities that now fall under the department of Agriculture used to fall under the Ministry of Food and Agriculture (MoFA); the department is, to some extent, still connected to the ministry. However, it is now also concerned with veterinary services and fisheries and not solely agriculture and relevant irrigation. This is also of interest for small reservoir development as fishing and livestock watering are important aspects of reservoir water use (see section 7.4).

The information concerning small reservoirs is gathered by the department’s Zonal Advisors, who in turn, receive their information from the department’s Agricultural Extension Agents (AEAs). The AEAs are responsible for identifying the problems that are affecting the communities surrounding the small reservoirs, which is done through observations made in the small reservoir communities, but also through communication with the Water Users Associations (WUAs) at the small reservoirs (see Appendix D for more detailed description). The flow of information can be depicted as in Figure 8-1 whereby it also is indicated what type of stakeholder could be found at the different levels.

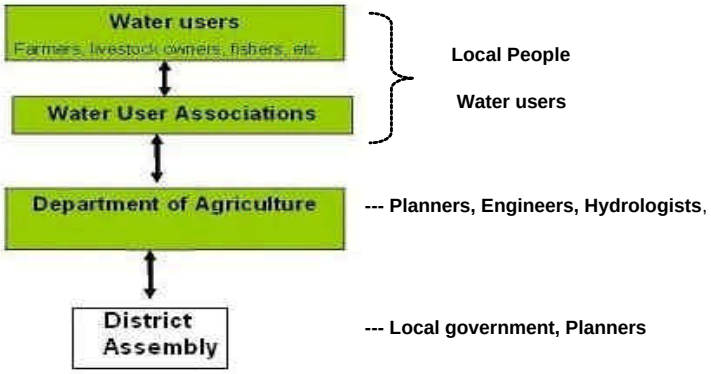


Figure 8-1: Information flow between water users and decision-maker (the DA).

Within the District Assembly, the various departments (of Agriculture, Planning, Education, Health, etc.) convene and representatives of the departments form committees who give advice to the district's policy-makers, the General Assembly. When it comes to small reservoir issues, representatives from, for example, the department of Environmental Health (which provides education to communities to prevent pollution and waterborne diseases) and the department of Agriculture may come together to discuss and generate advice as to how problems identified in the small reservoir communities can be approached. The General Assembly will then take this advice into consideration when drawing up the formulation and execution of plans, programmes and strategies for development that includes small reservoirs.

Also, the departments in each district in the UER are receiving assistance in getting communities organised in the form of training from IFAD via the LACOSREP II project. IFAD is the International Fund for Agricultural Development that is supporting the Upper East Region Land Conservation and Smallholder Rehabilitation Project (LACOSREP) phase 2. The objective of the project is to "empower rural populations in the UER to increase and stabilize their incomes and develop social infrastructures to improve their living conditions as well as their environment." See also Appendix C.

However, at the moment not too much information about actual problems concerning small reservoir systems is reaching the District Assembly. The main reason for this is that in most districts the Department of Agriculture is spending a lot of time on the development of the Water User Associations (so that information can actually flow from these associations to the departments) rather than on gathering information about the problems identified at the small reservoirs. This implies also that the department has not yet set-out to achieve one of the goals within the public participation spectrum as shown in Figure 3-4. However, from the interviews it became evident that the department (and possibly the District Assembly via the department as well) wants to work towards collaboration. This means that it is planning to partner with the public in each aspect of the decision-making process, which includes the development of alternatives and the identification of the preferred solution.

8.2 District Assembly

The District Assembly also has an institutional structure through which it is possible to acquire information concerning all types of issues or problems in the villages or communities; this is via the unit committees and the area council (see Figure 8-2). The figure also indicates what type of stakeholders such as those identified in section 6.1 could be found.

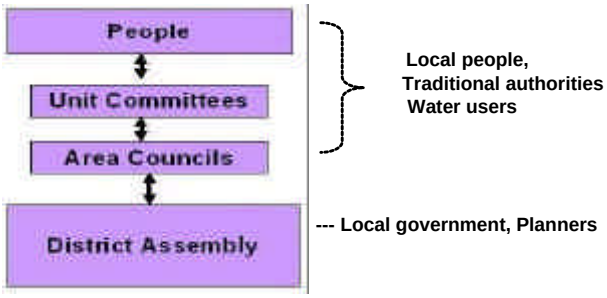


Figure 8-2: Institutional Structures enabling information from public to reach the DA.

The unit committee is made up of representatives from a village's units. A village generally can consist of approximately 4 units. Each unit committee in turn has a representative in the area council. The area council is made up of a number of electoral areas and can be called Town or Urban area councils depending on size. Representatives in the council are furthermore made up of those who have been;

- elected from electoral areas for General Assembly;
- elected for town area council;
- appointed by District Chief Executive.

Appendix E gives a more detailed description of these committees, councils, and the internal structure of the District Assembly, which is made up of a General Assembly and Executive Committee and Directorate. The Department of Agriculture is one of the DA's departments that make up the Executive Committee and therefore has the responsibility to carry out the policies made by the General Assembly (which is the decision-making body within the District Assembly) in the field of food and agriculture.

i. Information flow

While the Department of Agriculture is spending time on setting up and training the Water User Associations, it could be assumed that the information flows between the department and the District Assembly are also being worked on and to some extent utilized. However, from the interviews it became clear that the three studied districts are at different phases in which they can receive information and in which it can indicate what type of information it would want to receive.

In one district the officers indicated that they could not receive information or determine which information they wanted because the assembly is dealing with problems in setting up its internal framework. These problems were attributed mainly to the lack of financial means. Without sufficient financial means the DAs were experiencing difficulties in

- Hiring (or being able to pay) civil servants to fill the vacancies at the various offices,
- Buying office supplies, and in
- Obtaining office furniture and machines such as copiers and computers.

The reason for the lack of financial means was attributed to the fact that the amount received by the district from the Ghanaian national government is (considered) insufficient in order for the DA to carry out all its responsibilities. 10% of the national budget goes towards the 100+ district assemblies in the country; this is called the Common Fund. Approximately 20% of this support is for agricultural development. (Ghana Homepage)

ii. Different phases of development

However, these financial problems were not found in all districts. From the interviews, it was determined that some districts were ahead of others mainly due to received help from donors. This help is often based on preferences by donors due to the connections they have with Ghanaians from that district or with other donors who are already involved in a district. However,

preferential treatment does create an “unequal” balance; leaving the “less fortunate” districts even further behind the districts that have already received some support and assistance.

Nonetheless, in all three districts it became evident from the interviews that there are no databases or information gathering “systems” which can facilitate the storage and accessibility to gathered information. At the moment (or at least at one of the DAs) it was possible to rummage through filing cabinets filled with documents, without an index being available. However, no one was or is taking the time to rummage through these file cabinets or to make an index, which means that in the long term no one knows what information is stored or why and valuable information could go unnoticed or is lost.

8.3 Conclusions

One should remain aware that the above-described institutional structures are parallel structures, at least in the sense that the water users make up part of the local people and that the department of Agriculture is a small part of the District Assembly. This is depicted in Figure 8-3.

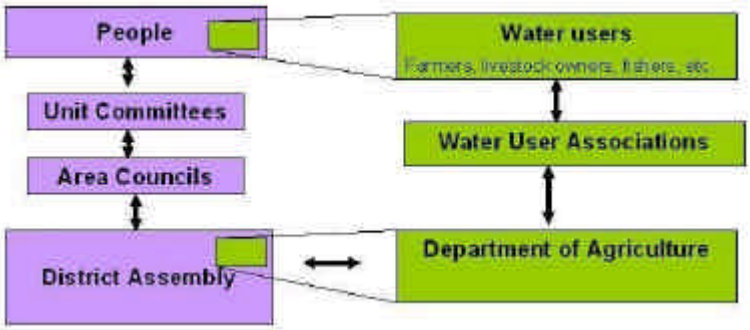


Figure 8-3: Parallel Institutional Structures

However, the district institutional structures (purple “side”) are not fully utilised in every district due to lack of financial means to do so. Also, the information that does reach the DA is not stored in manner that is accessible to officers at the DA or even their successors.

The departments of Agriculture in the districts of the Upper East (green “side”) do receive financial, capacity building and training assistance from the International Fund for Agricultural Development (IFAD) in order to help support the formation of Water User Associations. However, not too much information about problems concerning small reservoirs is reaching the District Assembly through the department since work is mainly spent on development of the Water User Associations rather than on gathering and collecting information. Despite the fact that the financial means are lacking that could otherwise ensure that the institutional structures described are (more) fully utilised, the institutional structures do provide a framework through which each DA could achieve information via public participation.

Yet, if IFAD is already underway to supporting decision-makers in achieving information from the water users and in giving information and training to the water users, it may not be useful to the District Assembly that the Small Reservoirs Project also looks at investment in this information flow on the “green” side of Figure 8-3. So then one could argue that the SRP should focus more on the information flow along the “purple” side. However, this involves all type of information concerning development of the district in general.

In terms of small reservoir development and water resource management in general, District Assemblies could largely benefit from knowing what other districts in the region are doing in the field of small reservoir management and/or of water management in general. After all, the districts often face similar problems when it comes to dealing with highly variable rainfall, drought and floods because of their geographic proximity. It, therefore, may be most useful for the District

Assembly that the Small Reservoirs Project looks at another type of participatory approach in order to help achieve sustainable development of small reservoir systems.

It may also be of more interest to the Small Reservoirs Project itself to look towards how information from various District Assemblies and other stakeholders involved in water resources management at the regional and basin level can be gathered, interpreted, distributed and shared. This implies looking at what is being done regionally concerning water management and uncovering what kind of information the different District Assemblies in the basin and region have already received from the water users about issues concerning planning, operation and maintenance of small reservoir systems. Also, information about what the District Assemblies have done (in the past) concerning management of small reservoirs would be of use.

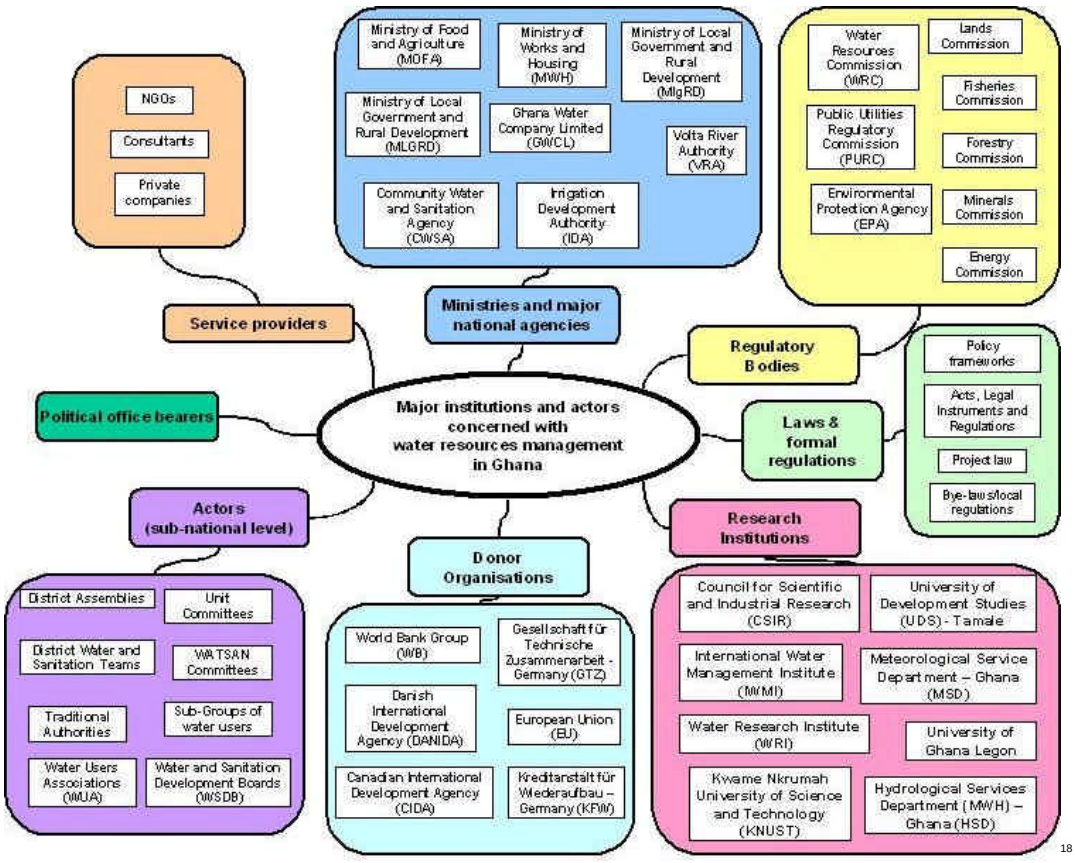
One should note, however, that the abovementioned would imply that ideally such information is readily available at all the District Assemblies, which was just explained that it is not. This means that there should collectively be something done in order to ensure that gathered information can be better stored and acquired. Maybe through collective working together, the DA's (with support from other stakeholders at regional level) could identify such a manner.

9 Stakeholders at national level

The previous chapter indicated how work is being carried out to support decision-makers in achieving information from the water users and in giving information and training to the water users. However, as it was mentioned, the District Assemblies could largely benefit from gaining information and knowledge from other districts and from various organisations and stakeholders concerning small reservoir management and/or water management in the districts in general, this could assist in improvement of planning, operation and maintenance of small reservoir systems.

The question is, however, which stakeholders are involved water resources management at the regional and basin level and how do these correspond with the stakeholders summarized in section 6.4? In order to answer this question this short chapter will step towards the national level and use information gathered by others to look at the stakeholders involved in water management at this level. From here a comparison was made with the stakeholders identified in section 6.4, Chapter 10 will then look more closely at the actual regional and basin level stakeholders and the institutional structure within which participation between these stakeholders can take place.

The stakeholders involved in water management in Ghana ware identified during an institutional analysis carried out as part of the first phase of the GLOWA-Volta project (GVP I, 2003). This led to the development of a map (see Figure 9-1) that shows the major institutions and actors concerned with water resources management in Ghana.



[18] Found on: http://www.glowa-volta.de/research/results_phase1/resultp1_w5.htm (retrieved march 2005)

Figure 9-1: GLOWA-Volta Actor and Institutions map

The map was used in this research as a basis for understanding which parties are actually involved in WRM in since it indicates, by name, who a number of the actual actors and institutions are active in Ghana. A simplification of this map is shown in Figure 9-2 which shows how the stakeholders mentioned in section 6.2 can be traced to fit within the 8 categories the GLOWA-Volta had defined.

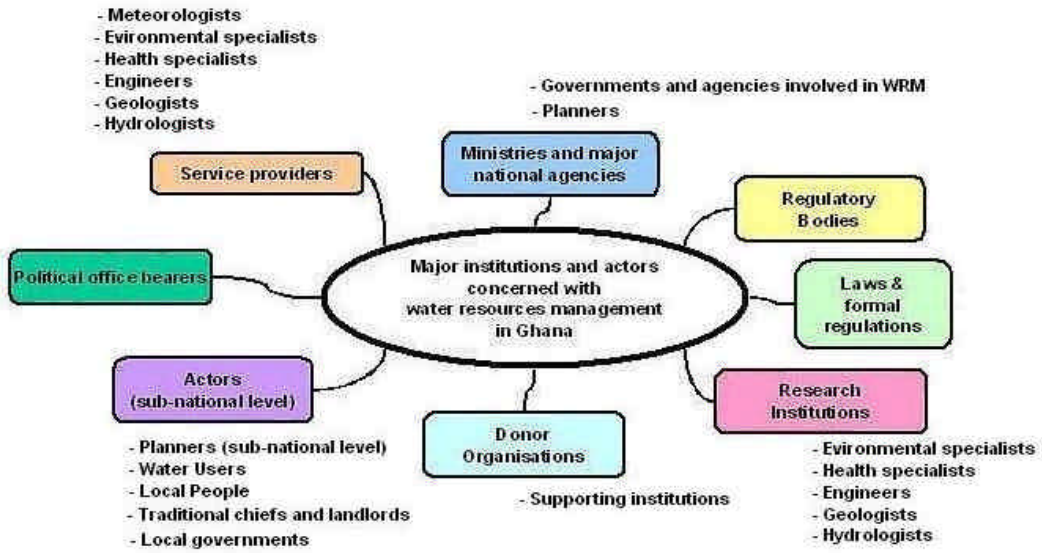


Figure 9-2: Simplification of GLOWA-Volta Actor and Institutions map

However, the GLOWA-Volta map does not indicate at what level the identified actors and institutions are involved in water management. This creates a slight confusion as to the role of an actor or institution and the importance of that role in water management at the various levels of governance. For example, if one looks at Figure 9-1, District Assemblies, Unit Committees and Water User Associations are named in the "actors (sub-national) category without indication of the different levels of governances that they are located at. The previous chapter showed how they are not at equal levels.

Furthermore, the map does not specify all stakeholders involved in water management, especially not at the small reservoir level for the Upper East Region. For example, one of the most important donors in irrigation management and small reservoir development in the region: IFAD (International Fund for Agricultural Development) was not mentioned. Also, the CGIAR[19] projects such as the Small Reservoirs Project are not mentioned either. However, this last is most likely due to the fact that these projects have started after the completion of GVP I in April 2003.

The map does, however, give an indication of the categories of stakeholders that are involved in water management. The same type of categories should be found at the regional and basin level. The following chapter will see if this is true by comparing a presently proposed water management board with the GLOWA-Volta map and with the stakeholders as shown in the above simplification of that map.

[19] Consultative Group on International Agricultural Research

10 Regional level institutional analysis

At the moment there are many stakeholders in the region and basin working on projects related to water management from which information could provide to be useful to the District Assemblies for development of small reservoir systems. However, it can generally be said that these stakeholders are working relatively independently from each other, since no water management institutional structure exists at this level yet. Ghana's Water Resources Commission (WRC), however, is working on setting up such a structure wherein the stakeholders van participate with each other in order to exchange information, experiences and knowledge. So maybe one can here say that instead of the District Assemblies implementing a participatory approach they become part of the community that has to participate in the approach.

This chapter will start with an introduction to the WRC, followed by a description of the proposed institutional structure; the basin management board. An analysis of this board was carried out and is described in section 10.3. The analysis looks at the manner in which stakeholders can work together in order to "foster changes in policy and practice, supportive of sustainable development" (Creech and Willard, 2001. p. 1), and to what extent it appears as if the members of the proposed board can acquire, assimilate and apply experiences and existing knowledge in order to realize, in the first place regional and basin water management, and in the second place, management of small reservoirs in the region and basin.

10.1 Water Resources Commission

The Water Resources Commission is responsible for the regulation and management of the utilisation of water resources within Ghana as well as for the coordination of policy related to these resources. The commission is the official "owner" of all water in Ghana, and is made up of 15 members including a "Chairman, the Executive Secretary, a (traditional) chief and two other persons, one of whom shall be a woman." (WRC Flyer) The rest are representatives of the following institutions:

- Ghana Water Company Limited
- Organisation producing potable water
- Hydrological Services Department
- Volta River Authority
- Irrigation Development Authority
- Water Research Institute
- Meteorological Services Department
- Environmental Protection Agency
- Forestry Commission and
- Minerals Commission (WRC flyer)

NB: This is where another comment is placed concerning the GLOWA-Volta institutional map (*Figure 9-1*), which does not indicate the link between the stakeholders in the various categories. For example, the Water Resources Commission is made up of members from organisations such as the Forestry Commission, the Environmental Protection Agency, the Forestry and the Minerals Commissions. In the GLOWA map it is not made explicit that these commissions do not work fully independent of each other.

At the moment the WRC requires all water-users to gain permission to use water via a permit scheme. Small reservoir water users, however, do not have to take part in this scheme, which means that water from this source can be used without official approval of the WRC. Yet, the WRC does want to know what is done with the water from small reservoirs in order to gain insight into how water is used within the entire basin. The WRC is setting up a pilot project in which it

plans to set up an advisory service in the form of a basin management board that will be in charge of making sure that all water issues in the White Volta Basin are more properly managed.

10.2 Proposed management board

In order to manage the water resources in the White Volta Basin one of the purposes and goals of the proposed White Volta basin management board is to understand how water from the small reservoirs is used and the affects of small reservoirs on the entire water system. The other (proposed) goal for the White Volta Basin management board is that operational guidelines are to be set-up by board members (Mr. Aduna, interview February 2005) and from there these guidelines are to be developed into a Water Action Plan. The basis for this goal comes from an earlier WRC pilot project that was set up in the basin of the Densu River, which is an important supplier of water to Ghana's capital, Accra, which is in the south. For the Dense as well as for the White Volta Basin boards the WRC envisioned four phases that would lead to action plans:

- Inventory and analysis of issues and problems concerning water resources in the basin,
- Development of IWRM tools for planning and decision-making,
- Outlining and evaluating alternative scenarios,
- Compilation of interventions into action plans.

The Densu Board is already underway and is working in phase 2. The White Volta Basin management board has yet to be formed. The question is, who is to make up this White Volta basin management board and to carry out the phases and steps envisioned by the Water Resources Commission? Figure 10-1 gives and indication of the stakeholders from whom it is envisioned (by those working towards setting up the board) that representatives will take place in this basin management board. The colours of the stakeholders correspond with the colours of the different stakeholder categories shown in Figure 9-1.

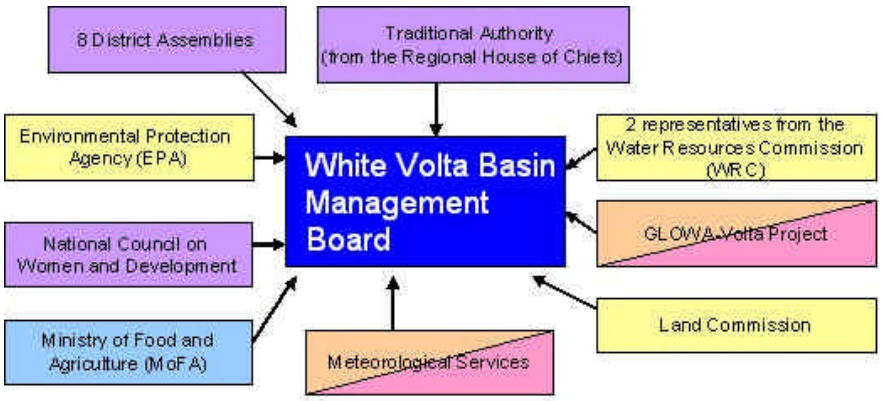


Figure 10-1: Proposed members of the White Volta Basin Management Board[20]

NB: Representatives from 8 districts are representatives from: Bolgatanga, Kassena-Nankana, Bawku-West, Bongo, Bawku-East, Talensi-Nabdam, Garu-Tempane and from West-Mamprusi (which is in the Northern Region). Note that the district of Builsa, which is in the UER, is not included.

The 17 board members were identified based on information from a stakeholder agreement workshop held in Bolgatanga in 2002 (at this point it was chosen to include West-Mamprusi and not Builsa, the reason was not found during this research). However, they coincide greatly with the members of the Densu board. For the Densu board a "Water Resources Management Problems Identification, Analysis and Prioritisation Study" was held in which relevant stakeholders were identified for the Densu basin. The membership of the stakeholders was then also agreed

[20] Source: Mr. Aduna, WRC. Interviewed March 7, 2005. Bolgatanga

upon during a stakeholder agreement workshop. It is not clear, however, whether a similar prioritisation study was held in the White Volta basin.

By working together in a board, it is envisioned that the 17 members will be able to combine their knowledge, experience and efforts in order to understand developments in the basin and to promote a communications infrastructure that provides a means for members to share experiences and draw on each other's strengths, expertise, and skills, which are based on their knowledge, wisdom and experience. Further description of the members can be found in Appendix C.

The representatives are to meet as a board in order to jointly develop tools for planning and decision-making. The WRC envisions that the board will coordinate water management activities in the basin (and region) and limit the amount of time and resources wasted on carrying-out similar types of projects. Furthermore, the WRC envisions that the board will act a "channel for relating information between the District Assemblies, the WRC and the other institutions" (Aduna, 2005). The authority of the District Assemblies is still to be respected in the development of the district, and therefore the plans that the management board develops should feed into the District Assemblies' plans.[21] The role of the DAs is then that they are representatives as well as indicators of what is possible to carry out and what resources (financial, capacity building, information, etc.) are needed in order to carry out plans.

10.3 Analysis of proposed board

The previous section gave an indication as to which stakeholders are proposed to make up the "community" that is to participate in order to foster changes in water management policy and practice in the White Volta Basin. This section aims to show how these proposed members represent the stakeholders identified in chapter 6, indicating which stakeholders appear to be missing and how they could possibly be represented within the proposed board.

A note should be made that the choice for the stakeholders that are proposed to take part of the management board is not necessarily doubted because these have been determined through a workshop and (possibly) a prioritisation study, even though the information about which was not accessible. Nonetheless, a number of weaknesses and strengths of the proposed board have been identified through a SWOT analysis as well as a number of threats and opportunities that further the set-up of the board could be faced with. The SWOT analysis can be reviewed in Appendix I, while the outcomes are discussed in the paragraphs of this section.

The advantage of the fact that the proposed board is not yet up and functioning, is that changes in its set-up can still be made that may allow for a number of weaknesses to be tackled and threat to be taken into account.

i. Central coordinating body

One of the main advantages of the proposed basin management board is that it proposes to make use of collective memory, experience and knowledge of various stakeholders within the region in order to develop water resources within one area. It gives the basin's stakeholders an opportunity to come together to discuss water related issues and to work together to find and develop solutions to possible problems. Thereby, different experiences and knowledge can be exchanged in a manner that otherwise they may not. This includes experiences in receiving and giving financial or capacity building assistance, experience in development of water resources in the region and elsewhere and experience in problems come across due to water resources development in the region and elsewhere.

[21] This is also why district planners should be involved in some manner in the development of the board's proposed action plans; to determine what is appropriate and feasible at the district level.

By getting those knowledgeable about water management and water development issues together, the stakeholders in the board can collectively discover what research has already been carried out, where there are still lacunae and where the input of each stakeholder is considered most useful by all other parties. In affect the board could make use of the institutional structures of the District Assembly and the district's department of Agriculture in order to achieve information on, for example, small reservoir systems and so also on many water related issues and problems that are experienced (this does, however, require good coordination of behalf of the district representatives between their work at the district and with the board).

The location of the proposed board's office is also located rather centrally in the region, namely in Bolgatanga, the region's capital which is in the district of the same name.

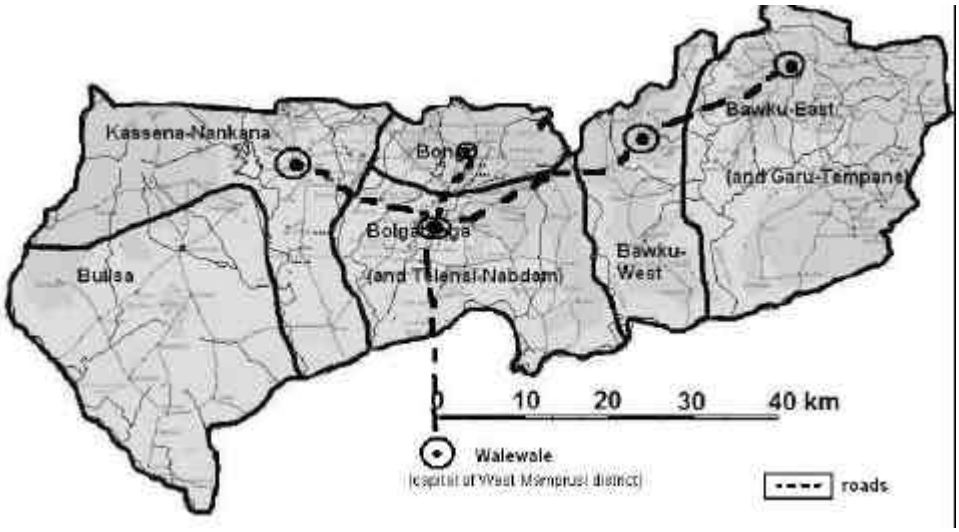


Figure 10-2: Location of Bolgatanga with respect to the capitals of the other districts

The roads that connect the capitals of the districts with Bolgatanga are rather good and serve as major arteries for the district's, region's and country's transport. For example, the road to Walewale is the major road that goes south to the larger cities of Tamale and eventually to Kumasi and Accra, and the road to Navrongo (Kassena-Nankana District) is the major road to Burkina Faso.

ii. Representation

Do the representatives of the board cover all areas about which information is needed for small reservoir (and water resource development in general) as discussed in Chapter 6? Looking at those who the WRC proposes to include as representatives of the White Volta Basin board and comparing this with the stakeholder summarized in section 6.4 it appears that a number of types of stakeholders are clearly represented by proposed members of the basin board. These are shown in Table 10-1.

Table 10-1: Stakeholders clearly represented in basin board

Type of Stakeholder	Proposed stakeholder in basin management board
• Environmental specialists	Environmental Protection Agency (EPA)
• Traditional chiefs and land lords	Regional House of Chiefs
• Local governments	District Assemblies
• Regulatory bodies	Water Resources Commission, Land Commission
• Meteorologists	Meteorological Services

However, a number of stakeholders appear not to be represented in the basin board:

Table 10-2: Stakeholders not clearly represented in the basin board

Type of Stakeholder	Possible representatives for these stakeholders
A. • Hydrologists • Engineers • Geologists • Health specialists	These types of stakeholders are often found at research institutes, so they *could* possibly be represented by the GLOWA-Volta representative or possibly by the representative of the ministry of Food and Agriculture. There are a few negative aspects to such representation, however, which are described in the following paragraph.
B. • Water users • Local community members • Planners (at various levels)	One could state that the District Assemblies representative should look after the interests of the water users and the local people. However, the DA is also the decision-making body representing the *local government* in general and which is to make and carry out the plans at the district level and so the representative will also have to represent the district *planners* (see footnote 21). This means that this one person may have to representative too many different stakeholders (and most likely with conflicting interests) within the board.
C. • Supporting institutions	Representation of donors may be of use only if a representative could represent all donors involved in the UER. This would then require the donors to form a cooperative. However, whether this is possible remains to be seen due to the various and ranging interests that each donor has in carrying out projects in the basin.

As indicated in Table 10-2, hydrologists, engineers, geologists and health specialists could be represented by the representative of the research institutes (foreign and local) since most often that is what these specialists work for. However, the only representative of the research institutes/ organisations in the basin is to be of the GLOWA-Volta Project, which would mean that all research institutes active in the region for other research institutes/ organisations are to be represented by one person working on one specific project. It seems unlikely that this representative can sufficiently represent all these organisations and their various interests.

Representation of the research institutions would, however, be more plausible if the research organisations active in the UER had formed a research cooperative from which one person is “elected” by all organisations to take membership in the board.

Though the representative from the National Council on Women and Development, cannot directly fit into a specific stakeholder category, inclusion hereof shows that the board is taking a step towards including women in formulating advice on issues that are of great concern to women especially since generally more women take part in water-use activities such as irrigation and gathering for domestic-use than men. Yet, the representation of women in the board seems very scarce considering that more women than men are involved in irrigation and domestic water use.

> NB: The reasoning behind this, however, could have to do with the fact that men are more likely to go to school and continue studies and fulfil positions that would enable them to become representatives in such a board than women. Also, the literacy rate in Ghana shows that 82,7 % of men are literate as compared to 67,1 % of women. (CIA World Fact book) Due to the rural setting of the UER, these rates are most likely lower in this region than the national average.

Also, question marks can be placed with inclusion a chief from the House of Chiefs in the board as a regular member. On the one hand such a representative can be useful in order to make sure that measures taken towards water resource development do not conflict directly with traditional water use and development. However, chiefs in Ghana generally enjoy a certain amount of respect from others, meaning that nothing he says is questioned. This may not be desirable in a management board that is to discuss different water management issues at hand.

When comparing the proposed board with the stakeholders and actors identified in the GLOWA-Volta map (Figure 9-1), it would appear that a number of “colours” are missing such as the:

- donor organisations (comments about representation have been given in Table 10-2)
- laws & formal regulations
- political office bearers

The *laws and formal regulations*, however, will implicitly be involved since the District Assemblies and the WRC have to adhere to rules of Ghanaian law (acts, legal instruments and regulations), and policy frameworks still need to be further developed for water management in the basin, which is one of the goals of the board. *Political Office bearers* also need to necessarily be specified since they are already involved via the institutions they are working for such as the District Assembly or the Ministry.

Furthermore, the *actors (sub national level)* and the *regulatory bodies* are over-represented in the proposed board while the *research institutions* and *service providers* are relatively poorly represented. In this proposed form the board would thus receive information only from two types of research institutions and service providers (GLOWA-Volta and the Meteorological Service), who are very focussed on specific aspects of the water development and water system in general.

The abovementioned shows that competencies within the board are not necessarily diverse, which, according to Miller and Floricel (in Miller and Lessard, 2000. p. 56) should be present in order to attain effectiveness within such a type of institutional arrangement. Furthermore, in the Theoretical Framework (Chapter 0) it was mentioned that the governing systems should "include representation of all society's members (especially the most vulnerable)" and that it should represent their different interest and aims to reach a broad consensus within society. The proposed board, however, does not include all of society's members, nor does it accurately appear to represent them. This could, however, also be due to the fact that not all of society's members have organised themselves as one could imagine happening in more western countries. Also, outsider organisations/ institutions have also not organised themselves. It becomes difficult to represent everyone at regional (basin) level if everyone is representing himself or herself.

iii. Leadership

From the interviews it became clear that there were plans to have one of the representatives from the Water Resources Commission fulfil the position of the chairman of the board. The reasoning for this was mainly because the WRC is the instigating stakeholder and thus one of their representatives could serve well as the link between the Commission and the board. This also implies that the chairman can make sure that the board carries out its activities according the wishes and ideas of the WRC and on the mandate of DANIDA[22] who is the driving donor behind the WRC's involvement in the White Volta Basin. However, from the interviews and literature no further specification of the role of the chairman was found.

Miller and Olleros (in Miller and Lessard, 2000, p. 101) stress the importance of a competent leader with a team of partners and complementary co-specialised firms in order to shape projects. Based on a number of cases they determined that a project's probability of success depends on the extent to which "it was characterised by a front-end process with sufficient time and resources to shape the project and its context." In this case, the *project* would consist of the activities of the basin management board.

It is therefore up to the leader(s) of the board to, especially at the beginning of the project, shape the project and those taking part in the project, which are the representatives who make up the board. According to de Bruijn and ten Heuvelhof (1999, p.72) the stakeholders in a project will have to invest in generating a common view as to the nature of the problem in order to determine the direction in which problem solving will go. However, this may not happen spontaneously and leader(s) will have to stimulate the discussions and lead negotiations between the stakeholders, also implying that the leader(s) are accountable for stimulating these discussions and implicitly for all actions undertaken by the basin management board. This does, however, require the leaders to assume the role of mediator and stimulator of interaction rather than one of central director (Koppenjan and Klijn, 2004. p.11). But leaders must be aware that in order to secure their own

[22] DANIDA: Danish International Development Agency

interest, they must lead the way in which the discussions and negations take place. (van der Voort, 2002)

And, in this role the leader(s) should take into account that the representatives may come from very different backgrounds[23] which may lead to clashes or difficulties in understand each other's ideals and values.

However, fulfilling such a role may not be possible in the proposed meetings which are to take place 4 times a year. Especially in the initial phases of the board it would appear more useful that stakeholders meet more often in order to set up guidelines. If meetings are held only every three months ideas from the last meeting may have already been forgotten or time will need to be spent on refreshing everyone's mind rather than working on the discussions, negotiation and on the actual development of the guidelines. Once guidelines and goals have been drawn-up, the meetings may not have to take place as frequently, as each stakeholder then knows what is expected and which tasks it has and how it can possibly achieve these. Meetings will then serve more as gathering moments at which experiences are shared and further activities are to be discussed.

iv. Cooperation

Koppenjan and Klijn (2004, p.10) also state that to achieve mutually satisfactory outcomes stakeholders must cooperate to work towards developing common goals. However, leaders of the board should, be aware that cooperation may be difficult to achieve in general and especially the initial phases since the members do not yet know what they are working towards and do not know yet how they are to interact with each other to reach certain goals. The reason that the board members initially do not know what they are working towards is because the guidelines for the board are to be drawn up by the members during the first number of meetings. Furthermore, the board members most likely have not cooperated with each other in such a manner before, thus may have more of a wait-and-see attitude.

To ensure cooperation it is possible that the leaders of the board stimulate that agreements are made between the board's members. Such agreements can be made concerning the working method of the board, e.g. the type of research that is to be conducted, the information system used, or the approaches used to facilitate interaction between the members (Koppenjan and Klijn, 2004. p. 198) Agreements could be in the form of covenants or gentleman's agreements, which are not strongly binding, but do partially ensure that each stakeholder will work together. However, a stakeholder can step out when it desires to since there are no strong agreements forcing it to stay.

> NB: Through cooperation stakeholders are able to define the common goals that they want to achieve. Participation then refers to the working together of the stakeholders to achieve these goals. However not all stakeholders must necessarily be involved in all the activities to reach all of these goals. Working together is dependant on the type of goal. For example, a health specialist may not necessarily have to work together with a hydrologist in order to determine the affects of still-standing water on the health of a reservoir community. Both parties are however, needed to set realistic goals for development of the reservoir systems.

v. Choosing board members

Despite the question marks placed above concerning the representation of society's members in the board, there are a number of comments to be made concerning the manner in which board members are to be "chosen" and how they are to function within the board.

In the first place, representatives for the board are planned to be chosen by the group/ organisations that they are to represent (source: interviews held). On the one hand, this is a good manner in which to give the represented organisation the autonomy to choose the person who it thinks will represent it the best. However, on the other, one could argue that organisations may

[23] NB: Even cultures and languages across the Upper East Region vary from district to district and also even within districts.

not necessarily choose the person who has the experience and knowledge in water management issues. Instead, choices may be based on other forms of merit (political, traditional etc.), which may not be of advantage to the management board. So, how can the WRC allow for autonomy while also ensuring that board members are interested, knowledgeable and experienced in water management issues?

One interesting undertaking that may help in answering this last question is that in the District of Bawku-West, the District Director of Agriculture (DDA) of the Department of Agriculture has created a new position for one of its zonal advisors. This advisor is to become responsible and knowledgeable on “all things related to water in the district.” As mentioned in section 8.1, the department is not solely concerned with agriculture and relevant irrigation, but also with veterinary services and fisheries, which also need and use water. Therefore, this function would focus on having one person within the department understand how water use for one activity (i.e. irrigation) affects the water quality, quantity or availability for another.

Such advisors may show to be very useful representatives from the districts to the board since they have an understanding of the various water-related activities and how each activity may affect others within the district. From interviews it was understood that the idea for this advisor came from the department of Agriculture of the district of Bawku-East, however, this could not be verified during the field study. Nonetheless, if already two districts in the UER have such an advisor it may be of use for the Water Resources Commission to look into the possibilities for having these persons as a representative on the management board from the districts. Also, the Water Resources Commission could, for example, look towards the possibilities for training similar advisors in the other districts.

Autonomy of the groups/organisation can be maintained then in the choice of the person who is to be trained to become an advisor. Similar set-ups may also be of use for other groups or organisations who are to be represented in the basin management board, in order to ensure that representatives in the board are interested in water management issues and in solving basin-level problems and are not necessarily representatives in order to reach other (political or social) goals.

> NB: The advisor who knows about “all things related to water” may be the right representative to represent the interest concerning water management in the district but maybe not the right representative to protect the interests of the District Assembly in general or to represent the district planners as well.

10.4 Conclusions

The set-up of a basin management board provides an opportunity for stakeholders involved and interested in water management in the Upper East Region and in the part of the White Volta Basin that lies within this region to share experiences and draw on each other’s strengths, expertise and skills. For District Assemblies such information exchange would especially be of interest since in this manner they can uncover what relevant activities others are undertaking in the region concerning development of water resources and (what is more interesting for this research) development of small reservoir systems.

However, a number of weaknesses of and threats to the proposed set-up were identified that could still be tackled and taken into account before the basin board is made operational. The main point of concern is that not necessarily all stakeholders who may have information, data, knowledge and wisdom in fields that are of importance for development of water resources are included in the proposed board. Furthermore, the coordination of the stakeholders and leadership by a chairman in shaping the project and generating a common view as of the nature of the problem, in the first place, is quiet essential, while no guidelines for such leadership appear to have been developed yet. Also, question marks can be placed at the manner in which board members are to be chosen; on the one hand those who are to be represented should have some form of autonomy in choosing their representatives. On the other, it would be advantageous to

the board if representatives have some experience and knowledge concerning water resource management and related activities.

The development of a water management board, however, is not only faced with the above mentioned problems, but also with a number of more socially, culturally and traditionally related issues. These need not necessarily be as comments directly concerning the institutional structure and therefore were not mentioned in this chapter. Instead they will be presented as dilemmas in the following chapter.

11 Dilemmas

The previous chapters have looked at the implementation possibilities of a public and stakeholder participatory approach in order to achieve development of water resources in the Upper East Region of Ghana. While the first type of approach looked more closely at the development of small reservoir systems and the inclusion of those who make use of these systems, the second approach looked more at the inclusion of various stakeholders who have interest in the development of water resources in the region in general wherein small reservoir systems play an important role.

Considering that the term *participatory approach* insinuates that people are involved, a number of social, cultural and traditional aspects that affect them must be taken into account in design of the approaches. In the past chapters a number of weaknesses of participation (either public or stakeholder) have been mentioned, but for implementation of an approach one must also realize there are a number of dilemmas. These dilemmas are often the result of where one wants to stream-line the institutional structure through which participation is to take place and encounters social, cultural and traditional aspects that do not coincide with the “ideal” institutional design.

For example, wanting to include women directly in a participatory approach may appear to be the ideal way to receive information about the problems they are faced with. Yet, religious and traditional aspects may hinder them from telling all there is to tell and therefore wanting to talk to the women directly or asking them to become directly involved may *not* be the ideal manner in which to uncover the problems they are truly faced with.

This chapter discusses a number of issues that were not directly linkable to what was written in the previous chapters, however, the chapter serves as an outlet for indicating dilemmas that are also of importance especially to organisations such as the Small Reservoirs Project to understand the “problems” that a decision-maker could be faced with when wanting to implement or take part in a participatory approach. Also, for the District Assembly the dilemmas may also be of importance to understand that, for example, donor assistance also brings with it a number of negative aspects which may not be at all desirable.

11.1 With inclusion of district officers

Involvement of district officers, officers at the department of Agriculture and Agricultural Extension Agents in participatory approaches (either public or indirectly with the management board) is important in order to collect and implement information concerning development activities in the district. However, these officers are often posted and not always from the district they are working for. During the field study it was learned that this may mean that they are not as involved in development of the district as if it were their own. So while they are responsible for development in a district they may not always truly be very interested in it.

Having officers who are not from the district, however, could be an advantage as well, as that they are not restricted or bound to family or social obligations within the district, as they might be otherwise. However, since they are not from the district they may not speak the languages of the local people (Kasem, Huasa, Frafra, Kusaal, Mampruli, Buli, etc.) or understand the local customs, which could be a disadvantage since it could hinder communication with the local people and understanding of the local social and traditional problems.

11.2 Faced with inclusion of donors

Due to lack of resources, capabilities, means and capacity needed, implementation of participatory approaches is often dependent on the willingness of donors to invest. Donors are also needed for assistance in understanding the technical aspects of maintenance of small reservoir infrastructure and in making investment decisions since these are relatively complex and specialised fields of which the farmers may have little knowledge. Yet, while donors could actually provide District Assemblies with sufficient financial support, capacity building and technical support they also have their own schedules and goals that they want to achieve via support.

For example, support may only be given if recipients carry out certain actions or follow certain steps, which in turn could turn out to be a restriction to development because this “instruction manual” does not take into account the local socio-political and cultural conditions. Furthermore, such manuals, in general, tend to encourage speeding up the process in order to meet donor goals. This, however, often does not allow the community absorb the funds sufficiently. (Kay, 2001. p.9) In the past, for example, western idealists thought that an increase in irrigation would lead to better livelihoods. Yet, in practice it turned out that the increase in irrigation brought along many problems as the local population traditionally did not have experience in dry-season farming or in selling the produce nor had they been trained via the western projects to develop these skills. As a result the irrigation fields and small reservoirs were not maintained and that is why now such projects as the SRP exist.

An important aspect to realise is that development of small reservoir schemes, as with many other smallholder schemes, takes a long time to develop; the process of improvement is often slow and incremental, usually in response to farmer demand. This may also “conflict” with the specific and tight schedules and budgets of donors and supporting governments. (Kay, 2001. p. 34)

Another dilemma concerning financial support is that while it is often necessary in order to get development activities started, it may lead to inactivity on behalf of the recipients in the long term as they become dependant on receiving funds rather than that they generate their own.

11.3 Difference between “north” and “south”

The differences between northern and southern Ghana become dilemmas for developing organisations as well as for local decision-makers when working with such organisations in the following manner. Indices are used by organisations to determine whether progress is being booked due to their support. However, these indices often use data that generally has been gathered and interpreted in order to describe the country as a whole, and not a region on its own (see the Human Development Index as described in section 3.3). So on the one such information could be a helpful guide to monitor progress, but on the other hand, because it doesn’t look at the regional level the depth in which progress can actually be monitored is limited.

Further more, organisations should become well aware, that there are big differences between “the south” and “the north.” To start with, the north, in which the Upper East Region lies, traditionally was the crossroads for the trans-Saharan trade routes and so was influenced by these traders (mainly from other African countries) and much less by the Europeans which the south saw many (more) of during colonial times. That is why information gathered about information about Ghana in general may not be applicable

Also, northern Ghana is far more rural than southern Ghana, focussing more on farming than industry and is comparatively poor because of this. This does, however, imply that issues concerning farming (and so issues that involve small reservoirs) are of more importance to and possibly better understood by northern Ghanaians. Nonetheless, as is the case throughout the world, rurality does bring with a certain sense of lack of development amongst urbanites; the city is the place to be and to work forward to a prospective future. This can have affects on the fact that someone who is posted to the UER is “banished” from there where development takes place.

This affects how such people carry out work as they may feel that this “banishment” indicated that they are not appreciated.

11.4 Politics

Participation implies the involvement of different stakeholders in order to gain the “best” view of a situation as possible, yet stakeholders can often be influenced by politics and loyalties that come with such politics and their view can therefore be “tainted.” Politics brings with it that the ruling party or parties often gain further control than others based on the positions they have directly been elected into, which causes unequal representation of the community’s members. However, a development organisation can hardly involve itself in the local politics, it must therefore find ways to respect the political loyalties while also finding as much diversity of opinion in the information it gathers.

11.5 Others in the region

For decision-makers, on the one hand it can be seen as very positive that many donors, international research institutes and NGO’s have shown great interest in the Upper Regions of Ghana because this has lead to the investment of various institutes and organisations in development in health and education, reforestation and agriculture.

However, having too many “outsiders” present has also created a number of problems as local decision-makers were blamed by local people for work that was unfinished and work that was done improperly (this information is based on interviews) even though the decision-makers may not even have been aware of the fact that the work was being carried out. Such problems could possibly be limited through better coordination and communication between organisations and the District Assemblies (or relevant departments thereof).

11.6 Formalities

Based on meetings attended during the field study and from stories heard from development workers active in the region, formalities play a very important role in the manner in which meetings are held in the Upper East Region. The custom is that formal greetings, welcome speeches and prayers were held at the beginning and end of the meetings, and they are very important to those attending the meeting. However, this sometimes meant that little time was left in order to discuss the matters at hand.

However, by realizing that these formalities exist, project leaders who want to hold workshops or discussions can limit their agenda per meeting and realize that more time and more meetings will be needed to be scheduled in order to handle all issues that “should” be discussed.

11.7 Conclusions

Support, be it financial or capacity building, will not bring with it only the positive aspects that donor organisations or local people envision. Local situations, social aspects and politics should be taken into account when setting up development plans because not doing so could form barriers to development. By understanding which people speak which languages and understand which traditions, and by realizing that rural Ghana is not “the same” as more industrialised Ghana, a development organisations and decision-makers can make better assessments as to where supporting resources could be of most use and how they can best be applied in order to actually assist without creating too many problems.

Part 4:

Conclusions & Recommendations

12 Conclusions

In semi-arid regions such as the Upper East Region (UER) of Ghana where people live with highly variable rainfall, water is a scarce resource that needs to be wisely managed so that the present needs of the region are met without compromising the ability for future generations to meet their own needs. One source where water can be found in the UER is in small reservoir systems. These systems provide an opportunity for the people to deal with inter-year rainfall variation by providing storage for a significant quantity of water. This water can then be used during the dry-season for various activities such as irrigation, livestock watering, domestic use and fishing.

Theories of Sustainable Development, Integrated Water Resource Management (IWRM) and River Basin Management offer that participatory approaches can assist the local decision-makers such as a District Assembly (DA) in designing and carrying-out management of such water sources. Over the course of the last 8 months this research, carried out for the Small Reservoirs Project (SRP), has looked at answering the following question:

> **What kind of participatory approach will be most useful to a District Assembly to achieve sustainable development of small reservoir systems?**

In order to answer this question a number of subjects were looked at such as; what participation entails and it what forms it can be implemented. A field study was carried out in order to gain better understanding of the small reservoir systems and the institutional structures that could allow for participation to take place, and an analysis of these structures in the Upper East Region was carried out. Because of the affiliation with the Small Reservoirs Project, this research also focused more on the most useful participatory approach which the SRP can help the District Assembly to achieve or implement.

A number of conclusions can be drawn from this research, which will be described in the following sections. They have been formulated keeping in mind that local decision-makers in developing countries have been committed by their national governments to show that they are pursuing good governance. The reason for such commitment comes from the decision of national governments to participate in debt relief programmes (which are also connected to the world-wide commitment to reaching the Millennium Development Goals) to which the “requirement” of pursuing this type of governance is attached.

12.1 Possible approaches

To begin; three levels have been identified at which or within which participation can take place: the macro (national), meso (district) and micro (grassroots/village), as shown in the following figure.

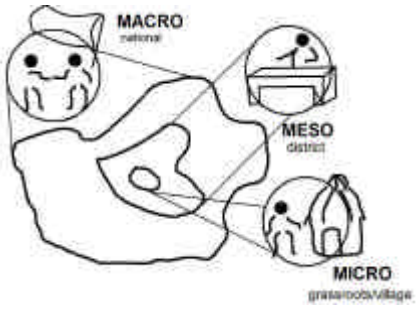


Figure 12-1: Levels at which participation can take place

The District Assembly, as the local decision-maker, stands within the meso-level, meaning that it can stimulate and take part in participation within its own level, and thus work together with other

district stakeholders such as the public and private sector institutions, research institutes, NGOs etc. in order to provide basic infrastructure or agricultural inputs or to manage the water resources (stakeholder participation). Or, it can stimulate and implement participation with the micro-level, which means participation with the local communities (public participation). These types of participation are represented by the following figures:

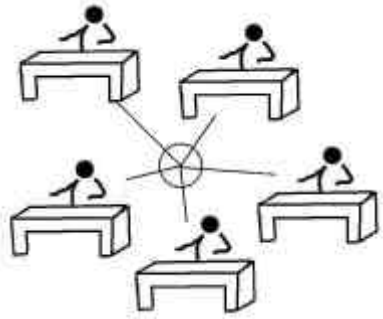


Figure 12-2: Stakeholder participation community

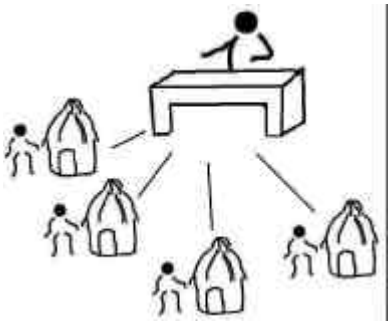


Figure 12-3: Public participation community

The District Assemblies could largely benefit from stakeholder participation in order to acquire, assimilate and apply existing knowledge and experiences from other DA's or from research institutes in the region and the basin. This knowledge and experience should concern issues that affect or influence small reservoir management, planning, operation and maintenance. Also, the DAs could largely benefit from public participation in order to acquire information about and feedback on decisions concerning small reservoir systems from the villagers. This kind of information is important to take into account since the villagers, and especially the farmers, make use of and are largely dependant on the small reservoir systems for water during the dry-season.

12.2 Information needed

The information needs concerning planning, operation and maintenance of small reservoirs pertain to aspect, problems and solutions about which the District Assembly would need information based on experience, knowledge and data in order to make informed decisions concerning the development of small reservoir systems. According to the Global Water Partnership (2003, p. 141), information can be defined in 4 broad types of information which are needed for Integrated Water Resource Management:

- **Data:** quantifiable and qualitative facts about characteristic of water resources
- **Information:** interpreted data
- **Knowledge:** information held in the mind
- **Wisdom:** agreement and commonly accepted methods of using water resources to ensure sustainability.

In the first place, information would be needed to understand the **physical aspects** of the system, such as the hydrology, geology, soils, water quality and quantity, water cycles (also includes climate) and ecology. Environmental specialists, hydrologists, meteorologists and geologists would be useful in order to gather data using equipment and to interpret data based on knowledge, wisdom and education. Water users and local community members are useful since they have knowledge and wisdom about the system based on experience.

Secondly, information concerning possible **water related problems** that could arise or be solved through development of the small reservoir systems would be of use in order to make well-informed decisions. This could include information about the affect of development on water borne diseases, drought, floods, erosion and sedimentation, pollution and eutrophication. Environmental specialists and health specialists would thus be needed in order to gather and interpret data, and to give (possible) solutions and teaching and training.

But problems may also include social problems that could arise possibly due to land use and water use (disputes) and traditional aspects. Involvement of water users and traditional chiefs and land lords who have local knowledge and wisdom is here fore necessary.

Thirdly, the District Assembly would need to know about possible **technical solutions** that can aid in solving former type of water related problems, whereby engineers, planners and local community members as useful a) gather and interpret data and to give possible solutions, teaching and training, b) in order to out plans and use interpreted data to design and plan and c) who have local knowledge and wisdom on what was done in past, respectively.

Fore last, information about the **organisational solutions** are of use to the District Assembly in order to understand what can be done at the organisational level of development in order to realize sustainable development. Local governments and planners at various levels (international, regional, district, local) can provide such information since they have knowledge on what was done in the past, have experience with local (regional and national) situations. Also, Local community members could be of assistance since they have knowledge and wisdom as to what has happened at institutional level in the past and finally, information can be gained from supporting institutions who can aid also in providing financial support, capacity building etc. They also have knowledge and experience based on other work that has been done elsewhere which could be applicable for development in the UER.

And finally, The District Assembly would need to know about the **managerial aspects** of development in the form of information about regulations (land and water rights), finances, education possibilities, and receive assistance in organisational structure building, capacity building, and communication. Economists, regulatory bodies, governments, institutions or NGO's involved in local, regional or national water management could provide support based on experience and expertise and can (in the case of the last group) give financial or more specified to capacity building support, for example. While, local community members have knowledge as to how traditionally certain land and water use issues (for example) have been handled in the past and should be handles in the future.

12.3 Learn from the past

Also, the following three questions were answered:

- What kinds of approaches have been used in this area (or similar areas) in the past?
- What lessons can be learned from past experiences?
- How do (or can) the past experiences relate to the present situation?

Though it is very likely that various types of participatory approaches have been implemented in the past, few of them have been clearly recorded and were not found and even less have been evaluated. However, evaluations of two projects, the "People's Participation Program" (1994) and "The 50 Well Project" (1988), were looked at and from them it was determined that the most essential component to successful participation is creating a willingness, enthusiasm and commitment to participatory approaches at participating communities.

Commitment can be enhanced through use of incentives and through creating a mutual understanding and agreement as to what is to be done, why, and within which time span. However, this requires leadership in which leader(s) will have to stimulate the discussions and lead negotiations between the stakeholders, also implying that the leader(s) are accountable for stimulating these discussions and implicitly for all actions undertaken by the basin management board. Thereby it should be realized that capacity building and training activities take time to implement and that it also takes time before water users learn to become water managers.

Though carried out 10 to 20 years ago, the context in which the projects and their assessments took place is still relevant to understand how to involve community members of the Upper East Region today. The reason for this is that cultural and traditional aspects play such an important

role in the region that it takes a long time for things to change. Though local communities easily adapt to having radios and cellular telephones (when enough money is available), aspects of social, cultural and traditional life are more imbedded and take longer to adjust or change.

12.4 Choosing participatory approaches

During the field study in the Upper East Region three possibilities that the current institutional structures offer the District Assemblies for participation to take place were identified:

4. Public participation via the districts' Department of Agriculture (green side of Figure 12-4).
5. Public participation via the unit committees and area councils (the purple side of Figure 12-4).

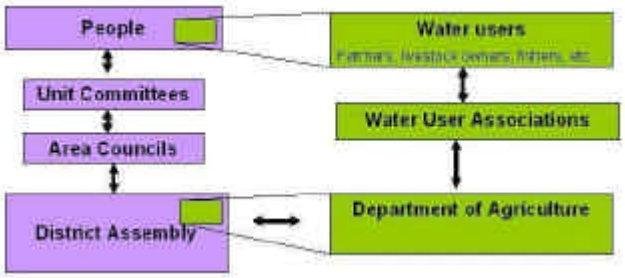


Figure 12-4: Parallel institutional structures at district level

6. Stakeholder participation in the form of the Water Resources Commission's proposed White Volta Basin management board such as in Figure 12-5.

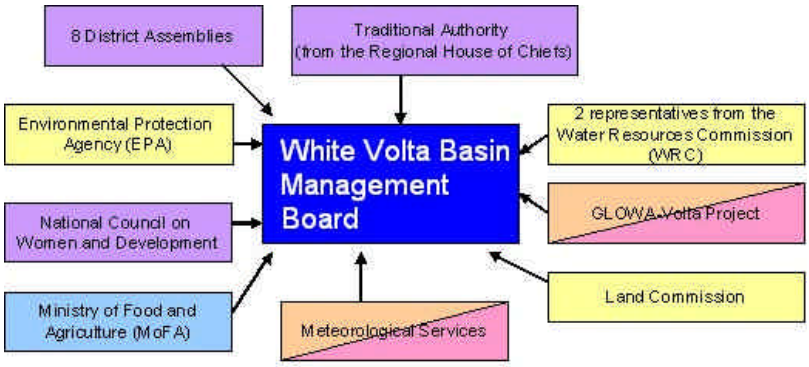


Figure 12-5: Regional institutional structure: proposed White Volta Basin management board

Uncovering which of these three is the most useful approach with which the Small Reservoirs Project could assist the District, was based on looking at the extent to which work is already being carried out to get the participatory approaches underway and the interest of the SRP in assistance of such an approach. From this it was determined that:

> **A stakeholder participation in the form of White Volta Basin management board is the most useful of the three identified approaches for the Small Reservoirs Project to invest in, in order to assist District Assemblies in development of small reservoir systems.**

This is because the International Fund on Agricultural Development (IFAD) is already investing in the first approach via the LACOSREP[24] II project and because the second approach focuses on too broad information about development problems in the district in general. Though the second

[24] Upper East Region Land Conservation and Smallholder Rehabilitation Project, phase 2

approach could use investing in, it is more of interest to the SRP to invest in a participatory approach that focuses more on water management and development of water resources rather than on development in a district or region in general.

The board provides the opportunity for representatives of various stakeholders interested in water management in the region to combine their knowledge, experience and efforts in order to understand developments in the basin. For the District Assemblies, as well as for the SRP, such sharing of knowledge can be very useful in order to gain better understanding of the greater water system that is to be managed by receiving information about the problems others have faced in management of parts of the system and the problems that could be solved or could arise due to development of the system. An advantage is that the board has been proposed but has not yet been set-up; there is in fact still room for adjustments.

12.5 Stakeholder Participation and good governance

A number of weaknesses of and threats to the proposed set-up of the board were identified that could still be tackled and taken into account before the basin board is made operational. The main point of concern is that not necessarily all stakeholders who may have information, data, knowledge and wisdom in fields that are of importance for development of water resources are included in the proposed board. In terms of good governance this means that the board is not *inclusive* and may not be *efficient and effective* since needed information concerning the system may still be lacking or require involvement of many others who may not be committed to assisting the board. However, through inclusion of a representative from the traditional authority and the national Council on Women and Development, the board does make an attempt to achieving *consensus* on what is best for the community as a whole because it enables issues of social, cultural and traditional importance to be discussed and represented.

Furthermore, the coordination of the stakeholders and leadership by a chairman in shaping the project and generating a common view as of the nature of the problem is quiet essential in order for the board to work in an efficient and effective manner. Having leaders often also implies that someone or some group can be held accountable. However, no guidelines for such leadership appear to have been developed yet for the board, therefore the a*ccountability* of the board is questionable.

Also, question marks are placed at the manner in which board members are to be chosen; on the one hand those who are to be represented should have some form of autonomy in choosing their representatives. On the other, it would be advantageous to the board if representatives have some experience and knowledge concerning water resource management and related activities.

Furthermore is not directly the responsibility of the basin management board to enforce a fair and legal framework, which is the characteristic of *following rules of law*. However, the board and its members should abide by the laws, take into account land- and water-se right and in managing water should be aware of human rights and preservation thereof.

On other characteristics of good governance the board has not shown how it aims to reach these. Though they may be in place, recommendations will be given as to how the characteristics can be achieved, and where they should become visible.

13 Recommendations

Having stated a number of conclusions in the previous chapter, this chapter describes a number of recommendations that could be given to the Small Reservoirs Project, the District Assemblies of the Upper East Region and to those who are setting-up the White Volta Basin Management board. In this set-up, it is thought that the SRP and DA's can also play a role since it is also in their interest that through the board water resources in the basin and region are sufficiently managed.

13.1 Achieving the characteristics of good governance

i. Transparent and responsive

Transparency and responsiveness of the basin board can be achieved through use of communicative instruments. These instruments must be used in order to build relationships with those whom the board members wish to inform, influence and work together with to bring about change, but also with the support of the representatives of the board.

There are plans to regularly give presentations to the general assembly of the 8 involved District Assemblies during the latter's weekly meetings about the board's actions. But information and responses to inquiries about the basin board and its actions can also be distributed via:

- The message boards outside of the District Assembly offices
- The message boards outside the districts' departments' offices
- The WRC's newsletter: "Waterfront"
- The radio

Through the district assemblymen and the Agricultural Extension Agents (AEAs) information can be distributed to the local communities. It is also through these "messengers" that the DA and thus the board should be able to receive and handle inquiries from the communities concerning water related issues.

Transparency and responsiveness also require the board to keep its own members (and their support) up to date on major policies that are being drawn up at the regional, national and international level that may influence water resources management in the White Volta Basin. This can be done during the meetings, but also implies that someone (for example, from the WRC) must be given the task to make sure that such information is acquired from other levels of water management.

ii. Consensus oriented

By realizing and understanding the traditional, cultural and religious aspects of the community concerning water resource management, the basin board can build up its own knowledge on how to deal with the different water-related interests in the community. This in turn leads to the capacity to reach a consensus on what is best for the community as a whole and how this can be achieved on the long and short-term

One way to achieve this understanding is through public participation, which means that issues that arise within a community should be voiced to the board. Ideas as to how to solve these issues should be communicated via assemblymen and Agricultural Extension Agents to uncover how various communities view the issue at hand. For example, together with or via the Water Users Association issues concerning (in this case) the small reservoir system development and the manners in which to carryout solutions can be discussed.

iii. Effective & Efficient

In order to make sure that the basin board and its members can work effectively and efficiently the first steps to be undertaken should be the (further) development of the information and **database offices** at the departments, districts and also for the board itself. The information that these offices receive should, for water management issues, include information about projects and work being done on gathering data and knowledge concerning:

- the water system,
- the problems that could arise or could be solved through development of these systems,
- the technical and organisational solutions
- and on the possibilities of implementing and making use of managerial aspects

The offices are to handle the information it receives in such a way that it can be easily accessed or looked-up. This means that in the database the following, for example, should be easily found:

- The person who submits the information,
- The office or organisation the person works for,
- The date of submission,
- A brief title
- To whom the information should further flow

(this is not an exhaustive list, but mentions a few essential aspects)

Efficiency and effectiveness also refer to the manner in which the information, once gathered and set into a database, is distributed to others. This means that regular meetings with all board members need to take place in order to distribute and discuss the information which their district, institute or organisation has gathered. Also, the members of the board should hold regular meetings with their district, institute or organisation to distribute the information received from the other board members.

iv. Equitable & inclusive

Equitability and inclusiveness refer to the equal treatment of all members. On the one hand this refers to equal treatment of members of the board by all other members of the board. On the other it refers to equal treatment members of the community in decisions concerning water resources.

In the first case it is recommended that the board (as a collective) should keep all its members involved in the same way; the manner in which they receive their information and are kept up-to-date should be equal. Thereby ensuring that members who have to implement the plans (such as the District Assemblies) are aware and included during discussion about that implementation or about the draw-up of the plan that affects their “area”. In this manner the board will not be able to draw-up plans that are impossible or very difficult for a certain party to realize.

In the second case, however, from the field study it was seen that this is sometimes difficult at a regional board level since society groups have not always organised themselves. However, it is recommended that the board and its members must work together to try and ensure that the interests of different water users are well represented in the decision-making process and one group is not favoured over the other. This could, for example, be done by stimulating the district representatives to achieve their information from the Agricultural Extension Agents and from their assemblymen so as to be able to gain a more general picture of water-related issues in a community or district.

13.2 Set-up of the board

Beyond achieving the characteristics of good governance, the set-up of the board will require to take into account the opportunities as posed by the District Assemblies and of itself, thereby realising the possible threats it is faced with.

One of the most urgent recommendations at the moment is for the Water Resources Commission (and assisting donors and organisations) to find a **facilitator** who can assist in setting-up the board. At the moment there is one person from the WRC who has the responsibility for setting up the board, however, doing this and then ensuring that the board functions as envisioned requires more than one person can handle.

A facilitator should be someone who has experience with leading such types of boards or networks and preferably should not be involved in other aspects of water resource management in Ghana, strictly because attention needs to be paid to functioning and set-up of the board first. The research institutes and donors can be asked to help find someone capable of filling this position.

Secondly, a board consisting of 17 members may be very difficult to organise due to obligations and different schedules of the various members. Also, since not all stakeholders that have relevant information for the development of water resources are included in the board, a different set-up may allow more readily for these stakeholders to become involved without having a board that is made of uncountable number of members. It is therefore recommended (and strongly urged) that the Water Resources Commission look into the possibilities of the board having a different structure whereby up to four members become the **daily board council.** This council will be in charge of organising the board meetings and providing the coordination of the sub-committees, checking to see if work has been done or not by members and what can be done in order to get the work done. In this set-up at least the following three positions should be filled:

- Chairman: responsible for setting the agenda of the meetings and keeping in contact with other basin boards and the WRC.
- Secretary: Responsible for keeping the minutes of the meetings, for storing these and using them to write up a yearly progress report
- Treasurer: responsible for the funds received (from WRC and possibly donors) and proper allocation thereof. Responsible for a yearly financial report

The rest of the proposed members could then form the advisory and information-supplying committees. An proposed organigram could be as depicted in Figure 13-1 whereby the representatives envisioned by WRC to take place in the board, could serve as members of the board who give advice, form sub committees, take action and make sure that information is passed down to their support.

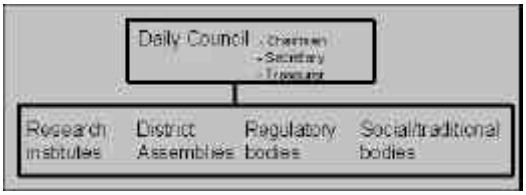


Figure 13-1: Possible form of the basin management board

However, the main point of concern as mentioned in the conclusions is that not necessarily all stakeholders who may have information, data, knowledge and wisdom in fields that are of importance for development of water resources are included in the proposed board. It is therefore recommended that those from the WRC who are setting up the board work together with a facilitator to see how these stakeholders can be included. In this new set-up doing so may be facilitated as sub-committees could ask for the assistance of those who have the knowledge, experience and information needed for tackling a certain issue. These people could become temporary “consultants” and advisors.

However, if creation of a daily council is not desired, then at least funding should be sought by the Water Resources Commission in order to create further incentives for board members to become and remain involved despite their other functions at their respective organisations or institutes.

It is also recommended that those who are setting-up the basin board and the District Assemblies look further into the possibilities of training advisors who are “responsible and knowledgeable on all things related to water in the district.” (see section 10.3.v) and on including these advisors as members within the board. This should take place in the “proposed” board or in the abovementioned “recommended” board.

Finally, it is recommended that the leaders of the board (in either present proposed form or in the set-up described above) work towards building willingness, enthusiasm and commitment among the board members to participate in the board. Commitment can be enhanced through use of incentives such as financial compensation for time spent working for or on the board. However, further research should be done as to what type of incentive is most likely to be appreciated by possible board members. Also, commitment can be enhanced through creation of a mutual understanding and agreement as to what is to be done, why, and within which time span. If everyone knows what they are working towards within a graspable time span, it is more likely that they are to remain involved and active.

13.3 Organisation of activities

It takes time to see results, so measures have to be taken to prevent members of the board from becoming discouraged. It is recommended that therefore the development of an action plan that looks at achieving small goals that lead up to bigger goals. In this manner achievements can be crossed-off, which stimulates members to work further towards achieving other goals.

Furthermore it is recommended that regular excursions should be encouraged among the board members to locations within the White Volta Basin (including Burkina Faso) to create an understanding of the water resource system and why certain things are as they are. Let members see what they are managing especially if there are board members who are not originally from the region. Members should be encouraged to make, plan or join trips to see similar activities that are being carried out by others. It is recommended that this happen in a similar manner as the field trip organised by the department of Agriculture and IFAD which bring farmers from one area to talk to farmers from another area. The farmers were able to share why they were growing certain crops instead of others and how and why they were solving certain problems in a specific manner.

And finally, it is recommended that especially in the first phases of the water board, monthly seminars be held during which the different stakeholders are requested to present what they have already discovered and would like to look further into or are capable of researching further. In this manner everyone becomes better informed as to which activities are taking place in the region and what information has already or can still be gathered and needs to be gathered.

13.4 Make use of others’ contacts and knowledge

It is recommended that the Chairman of the board, the Small Reservoirs Project and the District Assemblies make contact with donor organisations besides those already involved (DANIDA and IFAD) in order to request to make use of their experience, knowledge and means for assistance in water resource management.

Furthermore, via the District Chief Executives’ meetings and NALAG (National Association of Local Authorities in Ghana) meetings information can be given or supplied parallel to making use of district representatives and the planned regular workshops to be given during District Assembly’s meetings.

13.5 Follow-up

More research should be done in order to discover if the Water Resources Commission finds the abovementioned recommendations feasible or possible to carry out. Also, there may have been changes in the districts since the field study as District Chief Executives were to be appointed in March and April of this year.

Also it is recommended that before starting the next pilot project or set up of a basin management board, the Densu should be evaluated more extensively and the White Volta more thorough than the Densu was before the White Volta pilot started. Though it is logical that the WRC wants to continue its pilot projects, the difference between the Densu and White Volta board can provide some relevant information for future pilot projects and boards.

The development of the institutional structure of the District Assemblies and the information-flows from the public to the DAs via the unit committees and area-councils need investment too. Though this may not be directly in the interest of the SRP, it should be point of discussion within the basin board as well as being brought up by the DA’s at meetings with other DA’s and with sponsors in the region because this disfunctioning can affect the development of the region on a whole, which should ultimately also be of importance to all DA’s and any research organisation wanting to support development

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Reflection

When I started looking for a topic for my master's thesis I had decided that I did not want to stay in the Netherlands and preferably wanted to go to a developing country to work on some sort of project related to water use, water demand, water supply and water management. The reasoning behind this decision? Probably because I grew up hearing stories about development work, had lived in a number of developing countries and wanted to see if I could handle such work on my own and not vicariously through my parents. Being a student would allow me to test this while also having a safety net; the thesis work is bound to a time-limit which would mean that I could only do so much within that time and thus, theoretically, stay more focussed on a specific topic or area.

However, things, as they apparently most often do, change and don't always happen as you imagine. Not to say that this is a bad thing, but during the course of my study most projects and courses were fully outlined, you knew what you had to do, the manner in which to do it was often laid out and there was guidance from someone who essentially knew more about the topic than me. In my experience this is not the case with a master's thesis. Over the course of the last 8 months I've learned a lot, especially about myself, about myself in relation to this type of research and in relation to development work.

The constituent in the form of the Small Reservoirs Project was very kind in willing to take me on and let me travel to the Upper East Region to let me do whatever it was I wanted to do there for my research. I'm not sure if they really knew what I was going to do, or maybe they had a different idea than I did. Nonetheless, I arrived in Ghana with the information I had gathered from my literature study, my research proposal and was prepared to make changes if necessary.

I knew little about the Ghanaian culture other than what's written in travel books, but had developed somewhat of an understanding of cultures in developing countries from various stories and also a bit from my own experience. The social, cultural and traditional contexts I came across were therefore not necessarily bewildering, instead I found them rather intriguing.

For example, at the market in Navrongo there were a number of sellers (mainly men) who would try to charge me higher prices, figuring that I had money to spare anyway and to see if I would give it to them. This usually led to having to barter and/or having a number of them say things to me in Kasem, which I'm sure, were not only nice words. Yet, one day when I was walking towards the malaria-clinic because I was not feeling well (don't ask why I didn't take a taxi) apparently my discomfort was visible and one of the sellers from the market grabbed his bike, told me to hop on the back, and brought me to the clinic. When I jumped off he waved and bicycled on before I had the chance to reach into my bag in the hopes I had something to give such as cola nuts or fruit or anything to show my appreciation.

Another intriguing thing to see was that generally women would charge the actual local price for goods, and bartering with them often did not work. The yam was a certain price, that was that, no questions asked, and if you weren't happy with it, then you could go somewhere else. The men, however, apparently did ask higher prices and bartering with them was possible, where they'd usually end up at the prices the women asked. Yet, it's the women who generally feed the children, so why would they not try to make an extra thousand cedi's by "cheating" the white person? I haven't figured it out, but what I did notice is that more men were found in bars than women; most likely that's where men spent the extra cedi's, though I'm sure I'm also generalising here.

However intriguing these aspects were, I was not prepared as to how to integrate Ghanaian (and especially of the Upper East) cultural, social and traditional context with "western" managerial ideas. This is probably the most difficult thing I've had to deal with during the course of this research. In hindsight, I may have given myself too much "freedom" by going to Ghana with the idea that I would see what was happening there and then to adjust my work accordingly within the short time I had there. I had set up ideas in Delft as to what I would do if it turned out that something I wanted to research was already being looked at or was not considered important enough or was not possible to research. Yet, these scenarios did not really help, since I could not possibly think up a number of scenarios that I actually came across.

However, maybe setting up more concrete goals and setting a certain path and sticking to it rather than to look at "participation" in general would have helped me much more. This (more clearly defined) path could have served as a guiding line from which I could have wandered if and when necessary, but to which I would come back in order to stay more focused.

On the other hand, I think that I could not have anticipated the situations at hand and might have missed a number of important issues if I had rigidly tried to stick to one path or a number of goals. Not having a very defined path enabled me to see different sides of the work that was/is being carried out in the Upper East Region. I saw researchers focussed very much on their own work without seeing why others were doing their work. I heard of the "grey men" (often western consultants) who came to the area with air-conditioned jeeps, who spend half a day at the one irrigation site (for example) where all such men go to, talk to the "big men" and then go back either to Accra or back home to give advice about the situation in the Upper East Region, and I met a number of researchers who had spent a long time in the area and were achieving a number of things at a very small, local scale. Not only were the differences in such approaches from project to project interesting, but also to see differences with one project.

For example, one of the projects had anthropologists as well as more "technically-minded" researchers in the field in order to gather information with which a decision-making support tool could eventually be developed. However, these two camps are quite different; personality-wise the researchers are different and the research itself looks at very different aspects. Their working together does not always go well and if it does, not always smoothly. If I'm to give extreme examples; anthropologists complained about the rigidness of the engineers and that they were not taking into account social, cultural and traditional aspects of life in the design of "whatever it is they design." While engineers were complaining that anthropologists were gathering too "fuzzy" information and could not translate their data into numbers or figures so that they could be useful for implementation in a model.

Thanks to what I have learned during my studies I was (to some extent) able to understand and comprehend both sides of the research story. The importance of educating a number of people who understand the technical as well as the more *anthropological* side of development of infrastructure such as the small reservoir systems became quite clear. This then led to a better understanding of why a faculty such as that of Technology Policy and Management can be very useful especially in an engineering-based university. However, the difficulty lies in how to combine these two sides in order to realise effective and efficient development, especially in developing countries by people who are not from these countries.

Looking back at why I had such difficulty, I think the "problem" lay in the fact that the theories about institutional management, organisational structures, management in networks and strategic management that I was able to find in the textbooks that I have gathered over the years are often written from a western perspective. I found it difficult to find footing on which to base my ideas because these perspectives offer analyses of organisational and institutional structures that have to some extent already been built and are in affect. Naturally, the text was useful to get ideas as to how the management board "should" or "could" take shape. Yet, I found them difficult to apply to organisational and institutional structures that are still very much in development and where the cultures of those who are to take part of these structures appear far more complex that what I can see from my western perspective.

Some of the basic assumptions that I would most likely have made if I were considering a, let's say, Dutch small reservoir development project I found I could not make at all in Ghana. For example, de Bruijn and ten Heuvelhof (1999, p. 17) mention that that governments (at all levels) are not completely superior to other parties within society. And that as long as there are parties who do not want the same thing, the chances are small that government policy is carried out 100% as the policy-maker had wanted it to. In more western policy-making I would be more likely to agree with this, however, from my field study I saw that policy-making and politics are very different concepts in Ghana than in the Netherlands. Freedom to disagree and to actively do something about this disagreement is very different and so there it is possible to state that even though there are other parties who do not want the same thing, the policy-maker in Ghana is more likely to be able to implement what it would like without too many problems (the success of such implementation is a whole different story altogether). Yet, in this manner I found it difficult to apply theories such as those of de Bruijn and ten Heuvelhof

because I wasn't quite so sure of the relevance of foundations on which I think those theories lie in this developing region.

Similarly, I've had difficulty in integrating principles that development organisations and the projects that they support, such as the Small Reservoirs Project, are often "supposed" to be carrying out. For example, taking into account that a world-wide agreement has been made to achieving the Millennium Development Goals, and that in the water-related projects, a.) the Dublin Principles are to be taken into account and b.) that all projects should "strive" towards Integrated Water Resource Management. However useful I do truly think that having such principles and theories as a framework for development work can be, they cannot take all relevant social, cultural and traditional aspects into account. And so, from what I have seen, development organisations often have to "negate" a number of these aspects in order to achieve some development goals, which on the one hand could be quite logical considering that it is virtually always impossible to include everything in a project. On the other, however, what is negated is often that which time and time again is most difficult for organisations to uncover and requires a lot of time and means to uncover. From what I have experienced and read, this unfathomable aspect is that of gaining deeper insight in how traditions and cultures truly shape the society and how changes in these aspects will affect societies in possibly a negative and even unsustainable way. But when the "world" is pushing development to reach certain goals within certain time, how can one take the time (and it may not even be possible) to at least graze the surface of uncovering this deeper insight?

Therefore, I would have wanted to have spent more time in the region of study just to gain a further understanding of what plays an important role in different aspects of society and how these affect decision-making, or possibly how they do not. As mentioned uncovering this may not be completely possible, but spending 4 weeks (efficiently) in the Upper East Region, in hindsight, was very, very short, especially considering that a number of ideas with which I set out to the region were changed during the course of my stay. However, in "take two" I would go to the region for a number of weeks, come back and discuss with supervisors what I had discovered and more clearly set out a number of directions in which my conclusions could go, and then return in order to see how such directions are truly possible or implementable. But I suppose I'd have to find a few more sponsors in order to make such travel realistic. Also, in this second take I'd now be more prepared for the fact that western ideals are difficult to implement in non-western settings if you do want to take a number of "fuzzy" aspects such as cultures and traditions into account.

However, I did learn how to see a number of things in perspective. For example, I was amazed by the fact that even though there is not a lot of water readily available, cars were regularly washed only to become dusty as soon as the drier drove to the end of the street. During the 6 weeks I spent in Ghana most times I had to take bucket-showers and use buckets to flush toilets because the pressure wasn't sufficient for water to flow "on its own." Yet, when it's so warm and dry it doesn't matter how you have access to water, having access to it in general is of greater importance. This is especially true when it comes to water for drinking. And while my western stomach couldn't handle water from the taps, local people drink it more often than the "pure" water that is "bottled" in sachets. Also, seeing the water you washed the dishes with pour into the street puts a different perspective on having a sewage system, especially when you realize that sometimes the water in the streets comes from *man-holes* (septic tank) into which the waste-water from the toilet of a house empties. Yet people deal with this and don't seem to mind so much.

Next time I would approach my research differently, but that's inevitable considering what I've learned over the course of the last 8 months. I've learned about the "conflicts" between my ideas and the so-called *ideals* of development work and have learned about frustrations that arise as ideals and reality don't match as you would wish they would but deep-down know can't always do so. I've learned about difficulties in application of theories to real-life situations which were also not familiar to me. I've learned to see things in perspective and finally, I've learned that despite such difficulties I do still want to go out to developing countries to see what I can contribute to in development. And so, when it really comes down to it I'm very happy things went as they did, otherwise, how would I have learned all this?

Appendix A: Millennium Development Goals

At the United Nations Millennium Summit in September 2000 world leaders placed development at the heart of the global agenda by adopting the Millennium Development Goals (MDGs), which set clear targets for reducing poverty, hunger, disease, illiteracy, environmental degradation, and discrimination against women by 2015.

The eight Millennium Development Goals constitute an ambitious agenda to significantly improve the human condition by 2015. The Goals set clear targets for reducing poverty, hunger, disease, illiteracy, environmental degradation, and discrimination against women. For each Goal a set of Targets and Indicators have been defined and are used to track the progress in meeting the Goals. (http://www.unmillenniumproject.org/html/dev_goals1.shtm)

Goal 1: Eradicate extreme poverty and hunger

Target 1 Halve, between 1990 and 2015, the proportion of people whose income is less than one dollar a day

Indicator 1	Proportion of population below $1 per day (PPP values)
Indicator 2	Poverty gap ratio [incidence x depth of poverty]
Indicator 3	Share of poorest quintile in national consumption

Target 2 Halve, between 1990 and 2015, the proportion of people who suffer from hunger

Indicator 4	Prevalence of underweight children under five years of age
Indicator 5	Proportion of population below minimum level of dietary energy consumption

Goal 2: Achieve universal primary education

Target 3 Ensure that, by 2015, children everywhere, boys and girls alike, will be able to complete a full course of primary schooling

Indicator 6	Net enrolment ratio in primary education
Indicator 7	Proportion of pupils starting grade 1 who reach grade 5
Indicator 8	Literacy rate of 15-24 year olds

Goal 3: Promote gender equality and empower women

Target 4 Eliminate gender disparity in primary and secondary education, preferably by 2005, and to all levels of education no later than 2015

Indicator 9	Ratios of girls to boys in primary, secondary and tertiary education
Indicator 10	Ratio of literate females to males 15-24 years old
Indicator 11	Share of women in wage employment in the non-agricultural sector
Indicator 12	Proportion of seats held by women in national parliament

Goal 4: Reduce child mortality

Target 5 Reduce by two-thirds, between 1990 and 2015, the under-five mortality rate

Indicator 13	Under-five mortality rate
Indicator 14	Infant mortality rate
Indicator 15	Proportion of 1-year-old children immunised against measles

Goal 5: Improve maternal health

Target 6 Reduce by three-quarters, between 1990 and 2015, the maternal mortality ratio

Indicator 16	Maternal mortality ratio
Indicator 17	Proportion of births attended by skilled health personnel

Goal 6: Combat HIV/AIDS, malaria and other diseases

Target 7 Have halted by 2015 and begun to reverse the spread of HIV/AIDS

Indicator 18	HIV prevalence among 15-24-year-old pregnant women
Indicator 19	Condom use rate of the contraceptive prevalence rate
Indicator 20	Ratio of school attendance of orphans to school attendance of non-orphans aged 10-14

Target 8 Have halted by 2015 and begun to reverse the incidence of malaria and other major diseases

Indicator 21	Prevalence and death rates associated with malaria
Indicator 22	Proportion of population in malaria risk areas using effective malaria prevention and treatment measures
Indicator 23	Prevalence and death rates associated with tuberculosis
Indicator 24	Proportion of tuberculosis cases detected and cured under DOTS (internationally recommended TB control strategy).

Goal 7: Ensure environmental sustainability

Target 9 Integrate the principles of sustainable development into country policies and programmes and reverse the loss of environmental resources

Indicator 25	Proportion of land area covered by forest
Indicator 26	Ratio of area protected to maintain biological diversity to surface area
Indicator 27	Energy use (metric ton oil equivalent) per $1 GDP (PPP)
Indicator 28	Carbon dioxide emissions (per capita) and consumption of ozone-depleting CFCs
Indicator 29	Proportion of population using solid fuels

Target 10 Halve, by 2015, the proportion of people without sustainable access to safe drinking water and sanitation

Indicator 30	Proportion of population with sustainable access to an improved water source
Indicator 31	Proportion of population with access to improved sanitation, urban and rural

Target 11 By 2020, to have achieved a significant improvement in the lives of at least 100 million slum dwellers

Indicator 32	Proportion of households with access to secure tenure

Goal 8: Develop a Global Partnership for Development

Target 12 Develop further an open, rule-based, predictable, non-discriminatory trading and financial system [Includes a commitment to good governance, development, and poverty reduction – both nationally and internationally]

Target 13 Address the Special Needs of the Least Developed Countries [Includes: tariff and quota free access for LDC exports; enhanced programme of debt relief for HIPC and cancellation of official bilateral debt; and more generous ODA for countries committed to poverty reduction]

Indicator 33	Net ODA, total and to LDCs, as percentage of OECD/DAC donors' GNI
Indicator 34	Proportion of total bilateral, sector-allocable ODA of OECD/DAC donors to basic social services (basic education, primary health care, nutrition, safe water and sanitation)
Indicator 35	Proportion of bilateral ODA of OECD/DAC donors that is untied

Target 14 Address the Special Needs of landlocked countries and small island developing States (through the Programme of Action for the Sustainable Development of Small Island Developing States and the outcome of the 22nd special session of the General Assembly)

Indicator 36	ODA received in landlocked countries as proportion of their GNIs
Indicator 37	ODA received in small island developing States as proportion of their GNIs

Target 15 Deal comprehensively with the debt problems of developing countries through national and international measures in order to make debt sustainable in the long term

Indicator 38	Proportion of total developed country imports (by value and excluding arms) from developing countries and from LDCs, admitted free of duties
Indicator 39	Average tariffs imposed by developed countries on agricultural products and textiles and clothing from developing countries
Indicator 40	Agricultural support estimate for OECD countries as percentage of their GDP
Indicator 41	Proportion of ODA provided to help build trade capacity
Indicator 42	Total number of countries that have reached their HIPC decision points and number that have reached their HIPC completion points (cumulative)
Indicator 43	Debt relief committed under HIPC initiative, US$
Indicator 44	Debt service as a percentage of exports of goods and services

Target 16 In co-operation with developing countries, develop and implement strategies for decent and productive work for youth

Indicator 45	Unemployment rate of 15-to-24-year-olds, each sex and total

Target 17 In co-operation with pharmaceutical companies; provide access to affordable, essential drugs in developing countries

Indicator 46	Proportion of population with access to affordable essential drugs on a sustainable basis

Target 18 In co-operation with the private sector; make available the benefits of new technologies, especially information and communications.

Indicator 47	Telephone lines and cellular subscribers per 100 population
Indicator 48	Personal computers in use per 100 population and Internet users per 100 population

Appendix B: Interviews/talks

A. February 9, 2005. Accra, Ghana
Mr. Ben Y Ampohma
Economist of the Water Resources Commission (WRC)
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Fax: 233-21-763649
Email: watrecom@ighmail.com or byampomah@yahoo.com

B. February 10, 2005. Accra, Ghana
Mr. Dwumfour
Senior Natural/Environmental Resource Management Specialist
The World Bank
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North Ridge Res. Area
Tel: 233-21-229681 or
Cell: 233-20-8125142
Fax: 233-21-227887
Email: edwumfour@worldbank.org

C. February 11, 2005. Accra, Ghana
Dr. Nyamadi
Ghana Irrigation Development Authority
PO Box M154, Accra
Cell: 233-20-8299722

D. February 15th and 16th, 2005, Bolgatanga, Ghana
Mr. A-R. Z. Salifu
Deputy Director General (Agricultural development Project coordinator)
Ministry of Food and Agriculture, Regional Department
P.O. Box 3
Bolgatanga, Upper East Region

E. February 21, 2005 Zebilla, Ghana
Hon. Moses Appiah Abaare
District Chief Executive
Bawku West District Assembly
PO Box. ZE 1
Zebilla, UER, Ghana
Tel: 072-24686
072-23470
Cell: 024-4209489

F. February 21, 2005 Zebilla, Ghana
Mr. Abdulaih Abubakar
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Bawku-West District Assembly
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072-23470
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G. February 22, 2005 Bolgatanga, Ghana
Mr. Roy Ayariga
Regional Director of MOFA and Project Coordinator of MOFA/IFAD LACOSREP II
Ministry of Food and Agriculture, Regional Department
PO Box 3
Bolgatanga, Upper East Region
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Cell: 024-4964117
020-8244337
Email:
rayariga@yahoo.co.uk (private)
lacproj@africaonline.com.gh (office)

H. February 22, 2005 Navrongo, Ghana
Peter (Kassena-Nankana, MOFA director of Zone West)
@ MOFA District Office

I. February 23, 2005.Navrongo, Ghana
Mr. Mohammed Akalifa
Deputy District Coordinating Director
Kassena-Nankana District Assembly
PO Box 1
Navrongo, UER Ghana
Tel: 0742-22633
Cell: 024-2761978

J. February 23, 2005.Navrongo, Ghana
Mr. Collins Ohene Djan
District Development Planning Officer
Kassena-Nankana District Assembly

K. February 23, 2005.Navrongo, Ghana
Mr. Amadu Abubakare
District Budget Officer
Kassena-Nankana District Assembly

L. February 24, 2005 Navrongo, Ghana
Mr. Eric Dalaba
District Director of Agriculture
MOFA
Navrongo, Ghana
Cell: 024-4544009

M. February 24, 2005 Paga-Nania, Ghana
Mr. Sedu Abdulai Kramo
District Cooperative Officer
Kassena-Nankana District
Navrongo, Ghana
(met in Paga-Nania during training on records keeping)

N. February 24, 2005, Paga-Nania
Mr. Osmanu Issah Patrick
Agricultural Extension Agent for MoFA operational area in which Paga-Nania lies.

O. February 24, 2005 Bolgatanga, Ghana
Mr. Yussif Sulemana
Deputy MDA
MoFA
Box. 199, Bolgatanga

P. February 25, 2005 Bolgatanga, Ghana
Mr. Joe A Abugare
Municipal Development Planning Officer
Bolgatanga Muncipal Assembly
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072-22206
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Q. February 25, 2005 Zebilla, Ghana
Mr. Paul Siameh
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MoFA
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Tel: 233-(0)72-23465
Cell: 233-(0)24-4641260

R. February 25, 2005 Zebilla, Ghana
Mr. Asaaro Simon
Zone Supervisor
MoFA
Box ZE 2
Zebilla, Bawku-West District

S. March 7, 2005 Bolgatanga, Ghana
Mr. Aaron Aduna (and Ms. Eva Schiffer)
Basin Officer (White Volta)
Until office in Bolga is set up:
Leshie Cresent no E4 Labone
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Cell: 233-(0)20-8234442
Fax: 233-(0)21-763649
Aaronaduna@yahoo.com

T. March 7, 2005 Bolgatanga, Ghana
Ms. Eva Schiffer
IFPRI
Eva-schiffer@web.de
Cell: 024-3536938

U. March 8, 2005 Goo Dam, Kassena-Nankana District
Mr. Kofi
DADO, Zone North
MoFA Kassena-Nankana
Navrongo, Ghana
(Met at Goo site during field trip of Paga-Nania to Goo)

V. March 12, 2005 Toende Dam, Bawku-West District
Mr. Justice Apam
WUA executive committee member
(Helped with organisation and realisation of dam rehabilitation)
(Met in the field at the Toende dam)

- Miriam Sissoko (via email)
United Nations Office for Project Services (UNOPS) Ghana
MariamS@unops.org

- Marc Andreini
IWMI Ghana
c/o CSIR Campus, Odei Block
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- Amy Sullivan
IWMI Post Doc
Transboundary Water Governance Project (CP)
Volta and Limpopo Basins
Pretoria, South Africa
A.Sullivan@cgiar.org

- Wilson Agyare: Navrongo, Feb. 23, 2005
Email: Wagyare@yahoo.co.uk
wagyare@hotmail.com

- Joshua Faulkner
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- Jan Friesen
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- Irit Eguavoen
ZEF/ GLOWA Volta (sub project W3: Institutional Analysis)
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Ghana cell: 0243-143485

Appendix C: Proposed members of the White Volta Basin Management Board

Via the Ghanaian Government (website, documents etc.) and documents received from others who have looked more closely at the social structure of the Upper East Region it was possible to understand which stakeholders are involved in Water Resource Management in Ghana, in the Upper East Region and more specifically near small reservoir systems.

National Council on Women and Development (NCWD)

The NCWD was established in 1975 in order to serve "as the official national machinery for advising the government on all issues related to women. It collaborates with both national and international organisations on all matters relating to the status of women in Ghana." (Ghana tourism website)

The council has sponsored studies on women's work, education and training and on family issues that are relevant in the design and execution of policies for the improvement of the condition of women, whereby family planning, childcare, and female education are considered paramount. (Country-studies website) In Ghanaian society women are mothers, traders, farmers and office workers who make-up a little over half of the country's population. The NCWD takes the standpoint that the impact that their activities have on Ghanaian society cannot be overemphasized.

Environmental Protection Agency (EPA)

The EPA was established in 1994 in place of the Environmental Protection Council (which was established in 1974). Its main tasks are to advise the minister of Science and Environment on policy formulation concerning the environment and to coordinate such activities concerned with protection of the environment.

Meteorological Services

"The Meteorological Services Department (MSD) exists to provide efficient and reliable meteorological information by collecting, processing, archiving and dissemination of meteorological information to end users." (MSD website) The information that the MSD gathers from the 10 stations is concerns information on daily, monthly or annual rainfall, evaporation, humidity, sunshine duration, wind speed and direction, air temperatures, soil and earth temperatures and cloud cover.

MSD has an agreement with the Water Research Institute of Ghana that the latter receives a ten-daily report of the rainfall. One should note that the Water Research Institute (WRI) works together with the Water Resources Commission.

Traditional Authority (from the Regional House of Chiefs)

In Chapter 22 of the 1992 Constitution of the Republic of Ghana, the institution of chieftaincy, "together with its traditional councils as established by customary law and usage" is guaranteed. In every region there will be a Regional House of Chiefs in which the chiefs have been "determined" Parliament of Ghana. However, a chief will not take part in active party politics, or otherwise abdicate from his stool or skin.

The role of the Regional House is to give advice to the government in matters relating or affecting chieftaincy in the region and to keep records of chiefs and customary laws and lines of succession that are applicable to the stools and skins in the region. These stools and skins are symbolic for indicating who the chief of a region is.

Water Resources Commission

The Water Resources Commission is responsible for the regulation and management of the utilisation of water resources, in Ghana and the coordination of policy in relation to them. It began its activities in 1998, two years after it had been established by an act of Parliament; the Water Resources Commissions Act 522 of 1996. Its responsibilities are further explained in Appendix G.

GLOWA-Volta project

Research institutes play an important role in the development of small reservoir systems and water management in general because they help provide the scientific background and research that is needed in order to uncover in what manner development can take place. The GLOWA Volta Project (GVP) is an interdisciplinary project supporting sustainable water resource management in the Volta Basin. Main aim is the development of a Decision Support System (DSS) that will help the authorities in Ghana, Burkina Faso and the other riparian countries to optimise water allocation within the basin.

Working together with GLOWA Volta is also the IFPRI/ZEF Integrating Governance and Modelling Project is project 47 of the CGIARS Challenge Programme on Water & Food. Its goal is to "improve the livelihoods of rural poor women and men through more productive and equitable water use by facilitating hydro-economic cooperation between nations sharing transboundary water resources in sub-Saharan Africa and beyond." SRP and this project are to some extent linked, not only because of the project type, but because of their interest in the Volta as well as the Limpopo rivers.

Ministry of Food and Agriculture (MoFA)

The Ministry of Food and Agriculture (MoFA) is in charge of the development and growth of agriculture in the country with the exception of the Cocoa-Coffee and Forestry sector. Its primary roles are the formulation of appropriate agricultural policies, planning & co-ordination, monitoring and evaluation within the overall national economic development.(Ghana's government homepage)

In 1988, the Ghanaian government started a decentralisation programme in which the responsibilities of 22 ministries from central government were de-centralized to the district level. The responsibilities of MoFA concerning irrigation and thus also small reservoirs were handed down to form the Departments of Agriculture, which now officially fall under the District Assemblies. However, many remnants of the old structure still remain; the ministry still has approximately 40% of power over the actions of the district's department of agriculture. Also, at a regional level MoFA takes actions to ensure the development of systems such as that of the small reservoirs. MoFA, for example has close ties with the International Fund for Agricultural Development and so is also involved in the activities (and projects such as LACOSREP, described below) which IFAD undertakes in setting up and training the Water User Associations.

Land Commission

The Land Commission is responsible for land administration in Ghana. It manages public lands and any other lands vested in the President of the Republic by the Constitution or by any other law or any lands vested in the Commission. Its functions are performed in co-ordination with the relevant public agencies and governmental bodies. (GIPC website)

Donor Organisations

i. DANIDA

The Danish International Development Agency (DANIDA) is one of the driving donors behind the Water Resource Commissions involvement in the White Volta Basin. It has helped the WRC build up experience in IWRM and aims to further enhance the capacity of the WRC through assistance in the Densu River pilot study and the White Volta River pilot study.

It is assisting the WRC to implement components of the Strategy document which include the development of water policy, institutional development and capacity building, coordination of the water sector through establishment of technical committees, participation of stakeholders, regulation of water use, water use charges, allocation of water resources and the management of international waters.

ii. IFAD

At present, the biggest project concerning small multi-purpose reservoirs is the International Fund for Agricultural Development's (IFAD) Upper East Region Land Conservation and Smallholder Rehabilitation Project II (LACOSREP II). The objectives of the project are "to empower rural populations in Upper East Region living in poverty to use the opportunities provided by the project to increase and stabilize their incomes and develop social infrastructures to improve the living conditions of these populations as well as their environment. One component of the project pertains to the construction or rehabilitation of 36 small earth dams and support to Water Users Associations (WUA) for the sustainable use of these dams." (M.Sissoko in email, 10-01-2005)

IFAD advocates and releases bulk of funds for capacity building in the following areas:

- Gender sensitising
- Agricultural Development
- Promotion of income generating activities (PIGA)
- Organisation and Management (within MoFA)
- Water Resource Development (deals with water user associations, construction and rehabilitation of dams)

Actors (sub-national level)

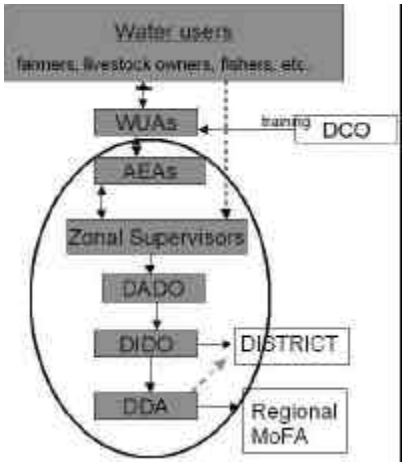
Not only donors, but also policy-makers at various levels should become involved in training and encouraging communities to work together and save money for future use in order to mobilize capital for investment. There must be money in order for water users to cover their expenditures and allow them to invest in further development of the system.

At the sub-national level the District Assembly is the most relevant actor involved in development of the small reservoir systems since it is responsible for carrying out, developing and monitoring plans concerning water management and overall development of the district. For further description of the DA, see Appendix E.

Appendix D: Department of Agriculture

The department of agriculture is actually the decentralised Ministry of Food and Agriculture, but does, in fact, belong under responsibility of the district and is most directly involved in development of small reservoirs because they supply water during the dry-season for irrigation.

At the "lowest" institutional level within the department one will find the Water Users Associations (**WUAs**). These associations should be responsible for:



- Protection of the dam and reservoir,
- Maintaining the reservoir and irrigation facilities,
- Efficient water use for the dry season,
- Crop production.

At present training is provided by IFAD and Cooperative Department of DA (the latter especially with leadership and service mobilization) so that the WUA can carry out these responsibilities independently. The department teaches the technical aspect.

At the "lowest" institutional level within the department one will find the Water Users Associations (WUAs). These associations should be responsible for:

- Protection of the dam and reservoir,
- Maintaining the reservoir and irrigation facilities,
- Efficient water use for the dry season,
- Crop production.

WUAs must register with the DAs, so that the DA can lease land for dam and irrigable area. This lease, which is to be signed by the DA, the tindana[25] and the chief, will empower the WUA to distribute the land during the dry season and in the rainy season it's up to the landowner (though not in all cases). Furthermore, the WUAs should have an executive committee consisting of at least a chairman, a secretary and a treasurer. This committee is then responsible for managing the WUA's accounts and records, which implies that they have to gather levies and penalties, and write and store the minutes of the association's meetings.

Furthermore, the department has split up the district into different zones each having a Zonal Supervisor and which are made up of operational areas, each of which has an Agricultural Extension Agent (AEA). The AEA does the following:

Holds PRAs (Participatory Rural Appraisals) in communities and thus allow for communities to indicate where the problems are.

- Should identify the problems that are affecting communities (dry season farming problems, high mortality of fowl etc.)
- Should work towards the formation of WUAs
- Gives information and feedback to the Zonal Supervisor concerning the activities in communities and the concerns of the members (all field staff meets once a week).

The water users or the WUAs in the operational area voice their problems to the AEA who reports to the zonal supervisor, who reports to his fellow supervisors and this information will be given to the District Agriculture Development Officer (DADO) who submits report to the District Information and Database Officer (DIDO). The DIDO should compile the information for the district and also bring it to the District Director of Agriculture (DDA) who, in turn, may also bring it to regional MoFA meetings.

The DCO is the District Cooperative Officer from the district's Cooperative Department, who at the moment has an important job in giving WUAs training as to how they can become self-sufficient associations. The officer works closely with IFAD in how to give successful training.

[25] tindana: earth priest) holds communal lands, rivers, and associated resources in trust, ensuring that the relationship between the land, the people and their ancestors in harmonious. Also ensures equitable distribution use of resources

Appendix E: District Assemblies

In order to give advice to the District Assembly concerning implementation of a participatory approach in order to achieve sustainable development of small reservoir systems in the district, a study was done to uncover what the DA actually entails.

According to the Ghanaian Constitution; a "District Assembly shall be the highest political authority in the district and shall have deliberative, legislative and executive powers." The districts were created in 1988 as part of the government's decentralization program in which the responsibilities of 22 line ministries from central government were de-concentrated to the district level.

Officially the district assembly is the local government responsible for the planning, operation and maintenance of small reservoir systems. However, since small reservoirs systems are mainly used for irrigation responsibility falls under the assembly's Department of Agriculture. This department was part of the Ministry of Food and Agriculture (MoFA) before the decentralisation process.

Composition and responsibilities

The Local government Act, 1993 (Act 462) prescribes the make up of the District Assembly as having:

a. One person from each local government electoral area within the district elected by universal adult suffrage;
b. The member or members of Parliament from the constituencies that fall within the area of authority of the District Assembly as members without the right to vote;
c. The District Chief Executive of the district (who is government appointed); and
d. Other members not being more than thirty percent of all the members of the District Assembly, appointed by the President in consultation with the traditional authorities and other interest groups in the district.
    i. 2/3 of members are publicly elected
    ii. 1/3 of members appointed by the District Chief Executive

Furthermore, the DA is the legislative power of the district, having to:

- Take the responsibility for the overall development of the district as well as playing a role in the formulation of the district composite budget;
- Mobilise and utilise human, physical and financial resources for economic and social development;
- Provide basic infrastructure municipal works and services;
- Develop and manage human settlements, maintaining security and public safety.

(The 1993 Local Government Act)

In addition, the Constitution prescribes that the DA is also responsible for the:

- Formulation and execution of plans, programmes and strategies for the effective mobilization of the resources necessary for the overall development of the district;
- Levying and collection of taxes, rates, duties and fees.

The District Assembly receives financial support from the Ghanaian national government to carry out its responsibilities. 10% of the national budget goes towards the 100+ District Assemblies in order to support them in local development. Each district spends approximately 20% of this support for agricultural development. (Home page Ghana website)

Further more, law mandates that the DA send out for research concerning its own performance. The Civil Service Improvement Programme sent out a survey to ask how the populus thinks of the DA. This then led to the Programme Implementation Plan, which started in 1997, was reviewed in 2000 and now a review plan is being drawn up that is to be taken into account in the *Median Development Plan*.

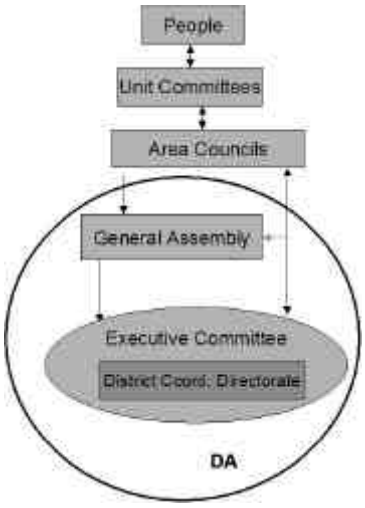
Draw up of district structure

During on a field study in the districts of Kassena-Nankana, Bolgatanga and Bawku-West interviews were held with various members of the District Assembly and the departments of Agriculture (see Appendix B for a list of names). The goal of these interviews was to discover in what manner the

District Assembly and the department of agriculture think that better development and management of small reservoirs can take place. In the first place questions concerned the institutional structures of the DA and the department of Agriculture in order to discover how information is shared, how it flows from the grassroots to the decision-maker and where there are strengths and weaknesses that could be used to identify the opportunities and threats to the District Assemblies.

From the interviews it was, however, also discovered that there is already an institutional structure that would allow for the District Assemblies to achieve information from the public. Thus, a public participatory approach is already set-up. The two figures below show this information flows and through whom it passes.

Information in the first place reaches the unit committees, which are the organised bodies that stand closest to the community members. Each village can consist of approx. 4 units each of which has a member in the unit committee. Every committee in turn has a representative in the area council.



The area councils are made up of a number of electoral areas and can be called Town or Urban area councils depending on size. Representatives in the council are:

- Those who have been elected from electoral areas for General Assembly;
- Those who have been elected for town area council;
- Those who have been appointed by District Chief Executive.

Members from the area council voice the problems they have identified and give the information that they have received to the general assembly, who use it in order to make district policy. The GA members, the assemblymen, are representatives of the people, whereby 70% of them have been elected from the various electoral areas of the district and the District Chief Executive has appointed the remaining 30%.

The Executive Committee includes the districts sub-committees such as: Social Services Sub-Committee, Works Sub-Committee, Finance Administration and Development Planning Sub-Committee etc. And the District Coordinating Directorate (DCD) is the central administration of the district. Within the directorate the various departments who carry out the policies made by the GA can be found, such as the department of Agriculture, of Community Development, of Education, of Social Welfare, of Economic Development, of Planning, and of Public Works.

If the area councils are not up and running, the District Coordinating Director will temporarily take the responsibility of managing the area council's accounts until it can do so itself.

Each district is headed by the District Chief Executive (**DCE**) who is appointed by the President "with the approval of not less than two-thirds majority of the members of the Assembly present and voting at the meeting." (Constitution of the Republic of Ghana, Chapter 20) The DCE's tasks are to:

- Preside at meetings of the Executive Committee of the Assembly;
- Be responsible for the day-to-day performance of the executive and administrative functions of the District Assembly; and
- Be the chief representative of the Central Government in the district.

For the development of small reservoirs the departments of Agriculture, the department of Cooperatives -which provides information about accounts and how to set up a cooperative etc.- and the department of Environmental Health -which provides education to communities to prevent pollution, waterborne diseases etc.- are involved. To a lesser extent the department of Forestry is involved in that it encourages trees to be planted in the catchments of the reservoirs.

Appendix F: Water Resources Commission

Information from the WRC's flyer about itself; "Striving for Integrated Water Resources Management in Ghana" received from Mr. Aduna.

The Water Resources Commission (WRC) is responsible for the regulation and management of the utilisation of water resources, in Ghana and the coordination of policy in relation to them. It began its activities in 1998, two years after it had been established by an act of parliament, the Water Resources Commissions Act 522 of 1996).

Functions of the Commission are:

- Propose comprehensive plans for the utilisation, conservation, development and improvement of water resources;
- Initiate, control and co-ordinate activities connected with the development and utilisation of water resources;
- Grant water rights;
- Collect, collate, store and disseminate data of information on water resources in Ghana;
- Require water use agencies to undertake scientific investigations, experiments or research into water resources in Ghana;
- Monitor and evaluate programmes for the operation and maintenance of water resources;
- Advise the Government on any matter likely to have adverse effect on the water resources of Ghana;
- Advise pollution control agencies in Ghana on matters concerning the management and control of pollution of water resources, and
- Perform other functions that are incidental to the above.

Composition:

The WRC is made up of 15 members including a Chairman, the Executive Secretary, a chief and two other persons, one of whom shall be a woman. The rest are representatives of the following institutions:

- Ghana Water Company Limited
- Organisation producing potable water
- Hydrological Services Department
- Volta River Authority
- Irrigation Development Authority
- Water Research Institute
- Meteorological Services Department
- Environmental Protection Agency
- Forestry Commission and
- Minerals Commission

A secretariat headed by the Executive Secretary, implements the decisions of the Commission. In pursuance of its mandate, the WRC developed a strategy document, with the objective to:

- Set the long-term goals based on the WRC Act and the Water Resources Management Study (WARM) and any other relevant studies and reports.
- To provide a medium-term (5 year) work plan that is realistic and verifiable and that will give the WRC guidance in its operation during the formative years.

The Danish International Development Assistance (DANIDA) is assisting the WRC to implement components of the Strategy document which include the development of water policy, institutional

development and capacity building, coordination of the water sector through establishment of technical committees, participation of stakeholders, regulation of water use, water use charges, allocation of water resources and the management of international waters.

Mission statement:

The mission of the WRC is:

To manage and regulate Ghana's water resources and coordinate policy in relation to them.

Our Vision is: an efficient and effective management system for an environmentally sound development of all water resources in Ghana, to assure the full socio-economic benefit for present and future generations.

The WRC will strive towards the above mission by seeking to:

- Establish an adequate and cost effective organisation, which can assist and guide the Government of Ghana in order to achieve the goals of integrated water resources management and monitor the achievements.
- Avoid duplicating of or taking over roles and functions that are already being carried out effectively by other bodies. Except of course those roles and functions that form the core responsibility of the WRC, such as regulation and licensing of water abstraction.
- Establishing good working relations with water users and other stakeholders in the Water Sector.
- Invite existing institutions and the private sector to participate, through outsourcing and contracting of specific tasks, in establishing its tools and procedures.

Focus:

The focus is to use the principle of Integrated Water Resources Management (IWRM) and adopt a strategy to achieve the vision of developing efficiently and effectively managing a system for the sustainable development of water resources in Ghana to assure full socio-economic benefit for present and future generations.

This will be achieves by ensuring:

- The protection and conservation of all freshwater resources
- Access to safe water and sanitation facilities for the entire population in both rural and urban areas.
- Availability of water in adequate quantity and quality to sustain nature, biodiversity and the aquatic ecosystem.
- Availability of water in sufficient quantity for cultivation of food crops, water of livestock and sustainable freshwater fisheries to ensure sustainable food security for the country.
- Availability of water for hydropower generation, industrial use, water transport and recreation.

For further information, contact:
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Cantonments-Accra
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Appendix G: White Volta Pilot Project

The White Volta Basin pilot project is the Water Resources Commission's 2nd pilot. The first pilot was carried out in the basin of the Densu River, which is an important source of water for Accra, the country's capital. The Densu pilot project was decided and initiated by the WRC as part of the Component Description Document that was submitted to and considered by the Danish international Development Agency (DANIDA) for support. The process towards the selection of both the Densu and White Volta as pilot basins started in 2000 when a Water Resources Management Problems Identification, Analysis and Prioritisation Study was carried out by the WRC. (Ampomah, 2004. p.1)

The pilot studies are considered by the WRC a valuable testing ground for the principles and approaches of the WRC's work. They are carried out in order to develop a better understanding of Integrated Water Resource Management (IWRM) and its application in the Ghana context. Based on this understanding action plans for IWRM will be developed, integrating lessons learnt from experiences. These plans will later on be analysed, the results of which will go towards application of further IWRM development.

Work phases

The members of the board are proposed to develop operational guidelines for the board and from there set out to work on a Water Action Plan (as it did also occur in the Densu). The envisioned four phases that were to lead to action plans in the Densu were:

1. Inventory and analysis of issues and problems concerning water resources in the basin
2. Development of IWRM tools for planning and decision-making
3. Outlining and evaluating alternative scenarios
4. Compilation of interventions into action plans

In the Densu the first phase was carried out via the Water Resources Management Problems Identification, Analysis and Prioritisation Study and the stakeholder agreement workshops. The second phase is said to require the development of a Decisions Support System (Ampomah, 2004. p.5) Though a number of steps have been taken in order to gather the information and technical data, Ampomah states that "development of demographic data indicators, data collection, and entry mechanisms as well as socio-economic screening procedures are yet to be collated/established." This thus implies that steps 3 and 4 have not yet been taken in the Densu, but does not limit the fact that these four phases may also be useful in application in the case of the White Volta basin management board. For example, the workshop results were carried further to determine who would be useful to have as a member of the White Volta basin board and resulted in the 17 proposed members, representatives from:

- 8 District Assemblies
- the Environmental Protection Agency (EPA)
- the National Council on Women and Development (NCWD)
- the Ministry of Food and Agriculture (MoFA)
- the Meteorological Services
- the Land Commission
- GLOWA-Volta Project
- The Traditional Authority (from the Regional House of Chiefs)
- 2 representatives from WRC.

Appendix H: SWOT of District Assembly

From the field study in Kassena-Nankana, Bolgatanga and Bawku-West a number of strengths and weaknesses of the various districts were identified. These are indicated below as well as the possible opportunities that exist for the successful sharing of information and the possible threats that can hinder this sharing. The following questions were stated when identifying these s,w,o,t's:

Strengths

- What advantages does the approach have?
- What is done well?
- What relevant resources do people in the approach have access to?
- What do others see as strengths?

Weaknesses

- What could be improved?
- What is done badly?
- What should be avoided?

Opportunities

- Where are the good opportunities that those setting up the approach are faced with?
- What are the interesting trends the members are aware of?

Threats

- What obstacles are being faced?
- Are relevant situations changing?
- Are there cultural conflicts?

Strengths

- All District Assemblies have parallel structures.
- There are various ways through which information flows from the local communities to the decision-makers (via the area councils and via the different departments, for example).
- A number of times a year the District Chief Executives of the region hold a collective meeting during which information and experiences are exchanged.
- The department of Agriculture has experience on involving community because of its experience as a ministry and because of IFAD's support.
- Communication between research institutes and other institutions that can assist it and the department of Agriculture is rather good:
    - For example, a number of farmers in Bawku-West in March 2005 were faced with problems with their onions, which they could not explain. The department of Agriculture called upon the Regional MoFA researchers for assistance.

Weaknesses

- Despite the willingness to make changes and understanding that they need to be made, the capacity or knowledge as to how to do so is not sufficient.
- Not all Districts Assemblies are at same level of having institutional structures through which information from communities can reach the DA (or vice versa). This can be due to:
    - Lack of funding
    - Lack of capacity
    - Lack of assistance from out side for funding or capacity building

- Integration between the District Assembly and the decentralised ministries (the departments of Agriculture, Education and Health) is not always clear. The departments often still have more affinity with the regional ministries than with the DA.
- Not all district departments have an information sharing system in place. For example; a database officer does exist at the department of Agriculture, but not always at the District Directorate.
- It is not well known, nor well documented, which research is being carried out in the districts, nor by whom and for what purpose.
- The researchers in the area, because they do not know who to approach, don't give information concerning research, which means that the DA remains unaware of what is going on and could possibly hire independent researchers to do work that has already been done. This is also because the information sharing or database systems are not always functional.
- Even though the county's official language is English, the local people in the different districts speak different languages (Kasem, Huasa, Frafra, Kusaal, Mampruli, Buli,etc) this could hinder communication with AEA's, for example.
- Not much information is reaching local levels as to what is going on at national level concerning water management.
- An AEA can be posted and doesn't specifically have to be from a village within the operational area. Also, District officials are not always from the district they are working for. This may mean that they are not as involved in development of the district as that it were their own (the same goes for AEA's). Also, they may not speak the languages of the local people, which could make communication difficult.

Opportunities

- The Upper East Region is an interesting investment area for donors and researchers
- There is a general understanding within the DA's that changes need to be made in order to realize better development of the district.
- Small reservoirs have been in use in the UER for decades; there are many lessons that can be learned from past management attempts and from successes or failures thereof. Some of this knowledge may be present at those living near or who make use of the reservoirs.
- There is a general willingness to make those changes in order to realize better development.
- The connections that the regional ministries (or department of Agriculture, for example) have with donors can be utilised for assistance in relevant department activities.
- Since the districts have parallel structures, lessons learned or strengths from one district could similarly be implemented or applied to the other districts of the region or even of the country.
- Since there are different "routes" between the decision-maker and the local community members if one "route" is not functioning information could still reach the District Assembly. Vice versa this also holds true.
    - If unit committees or area councils are not up and running "as they should," use can be made of department of Agriculture structure to receive information on reservoirs (water)
- At the DCE-meetings information and knowledge concerning water resource management can also be exchanged.

Threats

- Network structuring such as is proposed may bring over-bureaucratisation with it.
- Donors may not want to invest in a district that does not have a strong institutional structure because of fear that resources will not be applied adequately. This however may lead to a bigger difference in the development of districts as less developed districts will not receive the support they need.

- The quality versus quantity of information. Cultural, traditional or religious aspects may affect how things are perceived and what is or is not told. Men may traditionally be the ones who speak for the community, but women may be more aware of the issues concerning irrigation since the women do a majority of irrigation.
- Implementation of western ideas may be the way to get funding from donors but in practice these ideas may not always line up with the mannerisms of the Ghanaians. For example, in the past, the increase in irrigation brought many problems with it as the local population, traditionally, did not have experience in dry-season farming nor in selling the produce.

Appendix I: SWOT of proposed board

The basin management board can serve as a body where data, knowledge, information and wisdom can be shared and aggregated, but also where new knowledge and wisdom can be created and effectively applied. Participation in this form provides opportunities to improve governance and accountability of the local governments and constituents by exposing those involved in decision-making to the views and knowledge of those affected by the decisions or policies.

However, since the board has not yet been set-up the opportunity at hand is to review the proposed board and to analyse where its weaknesses and strengths may be in order to uncover which threats it may be faced with and where the opportunities lie in order to become a “successful” network. The same types of questions as indicated in appendix h were posed in order to determine these strengths, weaknesses, threats and opportunities.

Strengths of the proposed set-up

- The proposed board is to make use of individual and collective memory in order to achieve sustainable water management;
- Gives an opportunity for the region to come together to discuss water related issues and together try to find solutions;
- The set-up includes representatives from district assemblies (who are responsible for reservoir management);
- Includes a representative of the traditional authority (who can indicate if practices, measures and possible changes coincide or conflict with traditional manner of work);
- Includes a representative of the NCWD (who represents the women who are most involved in water-use);
- Includes a representative from the Lands Commission whose task it is to advise “on the policy framework for the development of particular areas of Ghana to ensure that the development of the individual pieces of land is co-ordinated with the relevant development plan for the area concerned;”

NB. There is overlap between some of the organisations; for example, the Lands Commission is required to have a branch in each region. These branches are required (according to the 1992 Constitution) to have, amongst others, a representative from the Regional House of Chiefs and from each District Assembly within the region.

- Setting up the office in Bolgatanga brings has the advantage that it is the regional capital, thus the location where regional offices of most institutions are located and that it is accessible from all areas via good roads;
- With the set-up of the board research institutes can more centrally discover or uncover what kind of research has already been done, where there are still lacunae and where their input would be considered most useful by all other parties involved;
- The board provides a central body to which all questions relating to water management can be asked (this is especially useful to other organisations who are not in the board but are working or plan to work in the basin).
- Different experiences and knowledge are to be combined in one board, thus allowing for information to be exchanged that otherwise would not be passed on.
    - Districts have different experiences in receiving assistance (financial or in capacity building)
    - Districts have different experiences in water related issues
    - Research institutes have experience in other countries or regions (as does the WRC, Land Commission and Environmental Protection Agency)

- There are possibilities to make use of the District Assembly's and Department of Agriculture's institutional structure to receive information on small reservoirs and thus many of water related issues

Weaknesses

- It is assumed that "good" representatives will be chosen by the district/organisation head;
- Not all proposed members have an information sharing system in place.
  For example, a database officer does exist at department of Agriculture but not always at DA level;
- A board of 17 members is quite large, getting them all together at one time may be difficult to realise;
- Meetings are to be held only 4 times a year, which means that either they will be very long, or not all issues can be discussed;
- There is no incentive (financial for example) for members of the board to become committed. Note: the WRC is willing to provide a transportation compensation, but has little means for other financial incentives;
- Guidelines are to be drawn up after representatives have been selected, thus there is little indication of what the representatives are to do before they commit themselves to the board.

Opportunities

- For donors the Upper East Region is an interesting investment area. Many donors and organisations are already involved in the region and their experience, knowledge and willingness to assist can be of advantage to the water basin board (such as the World Bank or Department for International Development UK, DfiD);
- Since the board has not yet been set up changes can still be made herein that allow for a number of weaknesses to be tackled and threats to be taken into account.

Threats:

- Since not all districts are at the same level of institutional functioning, the less advantaged district learns from the more advantaged without being able to give advice or information back. This one-sided information flow may hinder districts to want to help each other.
- Basin members also have their own task within district or organisation and thus may not have the time or the funds to invest a lot of effort in the board;
- 4 meetings a year requires meticulous planning in order to ensure that all relevant water management issues are discussed and tasks are reviewed and again divided;
- Representatives may come from very different backgrounds, which may lead to clashes or difficulties in understanding each other's ideals and values;
- Taking over ideas from the Densu Basin Board while it has not been fully evaluated, may lead to implementation of a board that is not sufficient for the White Volta Basin. This could also be due to a difference in issues that are to be dealt with within the basins.