

# ZEF

Bonn 2008

Working  
Paper  
Series

26

Center for Development  
Research

Department of  
Political and  
Cultural Change

GLOWA Volta Project

Irit Eguavoen and Eva Youkhana

## Small Towns Face Big Challenge.

The Management of Piped  
Systems after the Water  
Sector Reform in Ghana

  
universität**bonn**



Zentrum für Entwicklungsforschung  
Center for Development Research

ISSN 1864-6638

ZEF Working Paper Series, ISSN 1864-6638  
Department of Political and Cultural Change  
Center for Development Research, University of Bonn  
Editors: H.-D. Evers, Solvay Gerke, Peter Mollinga, Conrad Schetter

## Authors' address

Dr. Irit Eguavoen  
Center for Development Research (ZEFa)  
University of Bonn  
Walter-Flex Str. 3  
53113 Bonn  
[eguavoen@uni-bonn.de](mailto:eguavoen@uni-bonn.de)

Dr. Eva Youkhana  
Center for Development Research (ZEFa)  
University of Bonn  
Walter-Flex Str. 3  
53113 Bonn  
[Eva.youkhana@uni-bonn.de](mailto:Eva.youkhana@uni-bonn.de)

# Small Towns Face Big Challenge.

## The Management of Piped Systems after the Water Sector Reform in Ghana

Irit Eguavoen and Eva Youkhana

### Abstract

As the outcome of drinking water sector reforms in Ghana, three different management options are realized for small town water systems. Many piped systems remain centrally managed by the Ghana Water Company Limited even though a policy of community-based management is favoured. Alternatively, a management option of public private partnerships is fostered. The paper reviews and compares two of the realized options: public-private partnerships and community-based management. It asks what the outcomes of these two options are for the sustainability of small town water supply as well as whether one of the two options is preferable and should be pushed by policy. Further, the paper aims at showing some of the limits of participatory approaches in water development practice. It concludes that none of the management options offers a solution to the prevalent problem of failing water systems but both carry the potential to do so, if a system of continuous support and supervision for the managing communities would be established. Such tandem option between water administration and communities is still at its pilot stage.

### Keywords

Water, community-based management, PPP, Ghana

## Introduction

Community participation is currently the most promising approach in development practices. It is expected that active community participation leads to more empowerment of the target groups, to more transparency and sustainability of development projects. In recent years the approach has also been applied to the water sector of many developing countries in order to meet the deficient water supply and sanitary situation. Under the auspices of the World Bank, many developing countries introduced institutional and legal reforms as well as community-based management options in the water sector. In Ghana, reforms resulted in the National Community Water and Sanitation Program (NCWSP) and water management for small town water systems is understood to be one of the biggest challenges.

While rural settlements seem to cope well with community-based management, larger communities, urban conglomerates and small towns respectively are still struggling with adapting the new development path. This backside and challenge has been pointed out by many critical theorists and practitioners (Schouten and Moriarty, 2003). The focus of development projects on technical and financial issues, lack of human capacities and technical means, the complex cultural, socio-economic and political realities of communities and the fact that most decisions are taken outside formal organization are claimed to be the main reasons for water project failures.

This paper aims at showing some of the limits of participatory approaches in water development practice and the resulting pitfalls in community-based management stressing on the example of drinking water supply in Ghana. In order to do so we will have a close look at two management options for small town water systems realized under the NCWSP: public-private partnerships (PPPs) and community-based management. The third option of centralized state management was dealt with before (e.g. Fuest and Haffner, 2007).

After a discussion of the methodology and data set, we will continue with the elaboration of the water reform process in Ghana, the NCWSP and its implied concept of community-based management. Then, we will review the existing options for the management of small town water systems and compare their potentials and constraints.

## Methodology

The research agenda was driven by an interest of the impact of national water policies on local water management. Based on case studies in different small towns (see figure 1) we compare the two preferred policy options and approach them by addressing the following questions: What are the outcomes of different management options for small town water systems? Are any of the management options preferable? We also elicit the question whether the decentralization of the water sector and the assignment of responsibilities to the communities have led to a better sustainability of the piped systems.

The research was part of the institutional analysis component of the GLOWA Volta research project (2000-09) which is merely funded by the German Federal Ministry of Education and Research. The overall project objective is to design and to implement a scientifically-sound Decision Support System for the sustainable allocation and management of water resources in the West-African Volta River Basin under the condition of global climate change.<sup>1</sup>

---

<sup>1</sup> For more information, see project homepage [www.glowa-volta.de](http://www.glowa-volta.de)

The selection of the case studies took place according to project regions of external donor agencies, such as the European Union (EU) as well as the Canadian International Development Agency (CIDA), which are active in drinking water provision and capacity building for local water management. Both donor agencies financed the construction or rehabilitation of piped water systems. Moreover, they drafted and implemented a new institutional set-up to obtain and manage the water facilities. Qualitative as well as quantitative methods were applied during several field investigations from January 2004 to April 2005. Expert interviews with representatives of water authorities and donor organizations from national to local level provided data on current water policy, project laws, responsibilities, administrative relationships and main actors as well as on their perception of the water reform process. A large number of official and semi-official documents were included in the analysis. Long-term fieldwork was combined with interviews, participant observations and document review during repetitive shorter visits in a number of small town water systems in Brong-Ahafo, Ashanti, Upper East and Upper West Region.

Figure 1. Research sites



## Community Based Management and PPP Under Debate

First steps towards involving communities in water development projects date from the late 1960s, but were officially adopted by the international community in the late 1970s. With the International Drinking Water and Sanitation Decade (1980-89), the new paradigm was put into practice by massive expansion of donor investments in water supply and sanitation services (Schouten and Moriarty, 2003). 'Ghana has grappled with this approach since 1986, when cost recovery policy was first introduced and later modified to the user ownership and management policy in 1991' (Bacho, 2001: 5). Decentralization and the assignment of former state-run public services to the water user communities as well as their involvement into project planning and implementation form part of the current discourse of development cooperation found in international declarations like the Agenda 21, the Dublin Conference or the Budapest Conference. Bottom-up instead of top-down approaches, demand-responsive projects, capital contribution of communities, as well as the empowerment of marginalized individuals, such as the poor or women, are by now integrative part of water development strategies. Despite the introduction of a new development paradigm (Chambers, 1997), the donors realize that still a huge part of the population in developing countries are not served with potable water, especially in urban areas (WHO, 2006). Growing medium-size cities are often overstrained with administrative and logistic requirements under the new rules of self-regulation. On the one hand, water supply systems suffer because the policy has burdened local policy makers with responsibilities but not equipped with sufficient means to ensure service, such as human capacities, infrastructure and financial resources. On the other hand, water sector reforms even focusing on institutional aspects besides technical and financial issues still put a blind eye on divergent local cultural and socio-political conditions. But the desolate situation of water services in Ghana can partly be ascribed to socio-economic and political inequalities at local level and the exclusion of fractions of the population from decision making processes.

Even though community-based development strategies and participatory approaches can be called an achievement because they aim at an active role of local communities, their political implications as well as practical outcome are critically debated. Criticism scrutinizes the concept of community participation understood as a means to a development target with methodological implications and technical limitations (Francis, 2001). One line of argument points out that participatory approaches linked up with institutional reforms do not acknowledge the fact, that many decisions are negotiated and taken outside formal organizations (Cleaver, 2001: 42) as well as day-to-day interactions which dominate social exchange and political decisions. Another argument focusing on the institutional context stresses the impact of the size of a community as well as the intensity of interactions for successful participation. Schouten und Moriarty (2003: 138ff) argue in the same direction by identifying the complex mix of social, technical, and financial realities as one main reason for water system failure. According to the authors, many water development projects tend to homogenize the target group by pretending that conditions are the same everywhere. Consequently, the same development strategies are imposed to all project communities. But 'if communities are to be acknowledged as the managers of water, then we have to know who these communities are, what skills they have, and how they should be involved and supported' (Ibid., 2003: 139). The fact that external actors determine the development strategy as well as the process of project implementation has been complained in many studies about community-based natural resources management. But studies also outline possible drawbacks when communities take over public services and are practically involved in decision making and project planning (e.g. Cooke and Kotari, 2002; Eguavoen, 2008; Schiffer, 2004; Youkhana, 2007).

The crucial question who is understood as community, who is included or excluded in decision making processes at local level remains central to all authors as well as the question within which local arena decisions are taken (e.g. in public or private, formal organizations, traditional structures). Further, Lund (1990), for example, criticises that there is neither a common understanding of the terminology 'population/ local people' nor a precise idea of the model of participatory collaboration or cooperation. Instead, a variety of definitions, models, and context-depending meanings as well as an incoherent terminology are applied. It seems that participation as turned out to be an indispensable but not reflected ingredient for development projects. Understanding participation as a political strategy to empower underprivileged groups, power issues, and the redistribution of property rights, transfer of authority as well as the reallocation of natural and social resources may also lead to a reassertion of powerful interest groups and their occupation of spaces offered by participatory development schemes. In such cases, participatory approaches may strengthen existing unequal power relations within a community and may lead to resource capture by powerful old or new elites as Kothari (2001: 139ff) illustrates in her article about power, knowledge and social control. The debate about the promises and obstacles of community participation is not yet conclusive and local studies remain important to evaluate the impacts of development projects at community level.

Another option for the state to withdraw from water supply service is the involvement of user communities in collaboration with private enterprises. Private Sector Participation in drinking water supply systems of small towns in Ghana is a donor promoted strategy to improve efficiency, to reduce political interference, to increase accountability and to displace the deficient state-driven service supplies by international companies through management contracts (Fuest and Haffner, 2007). Main objections against privatization were formulated by the International Fact Finding Mission in 2002. It complained the low level of public awareness about the new water legislation and discovered major shortcomings in the participation of water user groups. It further criticized the separation of the water and sanitary sector and presumed major pitfalls for low income groups and an undermined role of regulatory institutions (FFM, 2002).

Before we present the results of our studies on small towns' water management, we outline important steps of the Ghanaian water sector reform by presenting the National Community Water and Sanitation Programme (NCWSP).

## Water Sector Reform and NCWSP

Under the auspices of the World Bank, the decentralization of administrative responsibilities in the water sector was promoted in Ghana since the mid 1990s. The formal organizational and institutional set-up of the national drinking water sector was revised according to international policy recommendations and principles of decentralization. Before comprehensive reforms took place, specialized governmental agencies, state-run and para-statal departments as well as private distributors were responsible for the distribution, management and protection of Ghanaian water resources. Several water management bodies worked largely in an autonomous way lacking an overall legislative and institutional framework (van Edig et al., 2003). The state owned Ghana Water and Sewerage Corporation (GWSC), which was reformed in Ghana Water Company Limited (GWCL) in 1994, was in charge of all drinking water supply and sanitation services of the country. The drinking water sector was largely deficient; unreliable water deliveries, leakages in the long-standing piped systems and a lack of means to maintain and renew the systems were but some problems (van Edig et al., 2003; Fuest, 2006; Laube and van

de Giesen, 2006). Urban coverage was only between 60 and 70 per cent; water loss was estimated to exceed up to 50 per cent of water production. The Government of Ghana heavily subsidised drinking water schemes. This limited both, GWSC's potentials to meet cost recovery and its performance of efficient administration. As a result, the increasing water demand of a rapid growing urban population could not be appropriately responded to (MoWH, 2002).

One of the first steps during the reform process was the creation of the Water Resources Commission (WRC) in 1996 (Act 522), which is the central water authority responsible for the protection and allocation of water resources as well as the sale of user licenses. Domestic water uses remained untouched by such administrative water rights and do not require user licences. In order to regulate water tariffs and water quality control, the two main regulatory commissions, Public Utilities Regulatory Commission (PURC) and the Environmental Protection Agency (EPA) were established. EPA was constituted in 1994 to regulate environmental issues and to implement environmental policy objectives (Act 490). EPA is in charge of water body protection and issuing fluid wastewater discharge permits in cooperation with the WRC. Actually, EPA operates only in large urban areas where its efficacy will gain more importance with the outsourcing of water utilities to private companies. EPA offices formally exist at district level, too, where they cooperate with the District Administrations (DAs) but there, efficiency obviously suffers some major drawbacks.<sup>2</sup> PURC neither holds a mandate at district level nor operates in rural areas and small towns. The agency was established in 1997 (Act 538) to regulate tariffs for potable water, to monitor utilities and to enforce standards of performance in larger cities where private sector involvement was targeted.<sup>3</sup> The drinking water supply and sanitation sector was divided into two sub-sectors in order to create beneficial conditions for the integration of private companies in large cities along the coast (like Accra, Tema, Secondi/ Takoradi as well as in Kumasi in the Ashanti Mountains). It was not only size and population numbers which mattered but also potential profitability. Since then, there is a distinction between one profitable urban sub-sector and one less profitable rural and small town sector (Laube and van de Giesen, 2006). Whilst urban drinking supply management remained centralized, a new management regime for the rural and small town sub-sector was introduced. Decentralized management units build the central part of the new management systems for rural and small town water supplies. In principal, the decentralized sub-sector forms two possible management structures: community-based management in (a) villages up to 2,000 inhabitants with hand pumps and (b) piped systems in small towns up to 50,000 inhabitants. But the clear differentiation between statistically defined rural areas and small towns is misleading due to a crossover of systems in small towns. Piped systems usually form one part of the potable water supply in small towns but a large part of the population is further on provided with water through rural water supply facilities, such as hand pump-fitted boreholes and improved hand dug wells. Unimproved water sources are additionally used to meet household water requirements. The provision through pipe-borne water is often limited to the urban core of the settlement, which is surrounded by rural areas belonging to the same administrative entity.

---

<sup>2</sup> On the one hand, insufficient means and human capacities to control and protect water resources limit EPAs and DAs exertion of influence. On the other hand, overlapping responsibilities and collision with traditional institutions, such as local chiefs, religious leaders or custodians of the land are major obstacles to fulfil their mandate (van Edig et al., 2003; Laube and van de Giesen, 2006).

<sup>3</sup> According to the mission, PURCs task is 'the development and delivery of the highest quality of utility services to all consumers and potential customers, while building a credible regulatory regime that will respond adequately to stakeholders concerns and also ensure fairness, transparency, reliability and equity in the provision of utility service.' (PURC 2007). In fact, PURC has also no possibilities to impose sanctions in order to enforce payments especially by water users, such as public offices and services. Hence, regulation of water tariffs at district and community level is shifted to the WSDBs, whose sanction capability is even lower. <sup>4</sup> In both towns, a WSDB had been established which persisted even though GWCL did not transfer the Navrongo water system to the community and Sirigu failed to meet the 5 per cent capital cost requirement to get the project started.

Hence, potable water provision underlies practically two distinguished management schemes: the rural water management scheme and the management scheme for piped small town water systems:

Stated aim of the Ghanaian Government is to provide at least 85 per cent of the rural and small towns' population with potable water and sanitary facilities until the year 2015. The NCWSP strategy to reach this target is based on the three pillars: (a) demand-responsive approach for community selection, (b) payment of 5 per cent capital cost for construction by the communities to enhance a sense of ownership and (c) 100 per cent self-finance for operation and maintenance of the water system by the community. Private sector participation was promoted not just for major cities but also for towns with up to 20,000 inhabitants and high rates of population growth. Small town communities were expected to choose from these two management options.

District Water and Sanitation Teams (DWSTs) were implemented in the DAs. According to the NCWSP policy, small town water systems and rural water supply facilities form one and the same category and should preferably be managed by local water user communities - ideally without external interference or support. The DWST are supposed to step in when communities request the DA for help. Moreover, they are established to allocate facilities within the district and to monitor water projects.

At very local level, two management bodies can be distinguished, such as Water and Sanitation Committees (WATSANs) being in charge of the daily operation and maintenance of either hand pumps or standpipes and Water Sanitation Development Boards (WSDBs) who manage water systems in small towns. Local representatives are supposed to be elected by the respective water user groups. According to project law, WATSAN committees are trained and advised by the DWSTs. It is understood that the five to seven members of the WSDB (with ideally 40 per cent women's involvement) contribute voluntary work. WSDB members receive professional training to protect water resources, to manage the systems, to fix tariffs and to ensure regular water supply. Thereupon the WSDBs formulate by-laws, which are to be ratified by the DAs.

In accordance to the Ghanaian water law, decentralized water supplies are under the responsibility of the independent Community Water and Sanitation Agency (CWSA, Act 564). Nowadays, the CWSA sets standards for water projects and facilities and monitors on-going projects. Further, the agency facilitates financial involvement of international donors. CWSA is organized at different administrative levels. Its Regional Water and Sanitation Teams (RWSTs) support and provide technical know how for the DWSTs and monitor water projects in the particular region.

CWSA policy favours the communal management option. Whilst centralized state management is often manifested as pre-reform management option in small towns, the privatization of piped systems in small towns was developed as a second alternative management option for small towns, where communal management was not favourable due to technical factors or not desired by the population (see figure 2).

**Figure 2.** Management options for drinking water under NCWSP

Urban settlements (piped systems)	Small towns (peri-urban settlements) (piped systems)	Rural settlements (hand pumps, hand dug wells)
State management GWCL	State management GWCL	Community-based management
	Public Private Partnerships	
	Community-based management	

Source: Eguavoen, 2008

Presently, most of small towns' water systems are either under community-based or state management. Whilst many small towns with community-based management seem to be overstrained with their management charges, an increasing amount of WSDBs are in the process of involving private companies, either as operators of piped systems or as subordinated service providers, such as area mechanics.

The following analysis of different management options for drinking water supply in small towns will pick up some of the arguments mentioned above and discuss the claims and realities of community-based management.

## Public Private Partnerships in Practice

The decision to involve private operators in urban conglomerates of Ghana induced a wave of protest by civil society groups and members of NGOs working on water and health-related issues (Eguavoen and Spalthoff, 2008). Even though the fear that water tariffs would increase for the poor by privatization seem not appropriate when comparing present and projected prices (Spalthoff and van Rooijen, 2007), the national campaign against privatization of Water (NCAP) lead to a shift in policy and an enhancement of public private partnerships in community-based management systems.

The following two case studies provide insight to the EU funded Small Towns Water Supply Project (1998-04) in Brong-Ahafo, Ashanti and Western Region. The project aim was to provide thirty small towns with potable water supplies, amounting to thirty liters of potable water per person per day concerning ca. 350,000 people. To finance the installation of the new system, drilling work and the provision of pumps, a total of €15,750,000 was allocated from the seventh European Development Fund.

To ensure an improvement of drinking water supply, the WSDBs had the choice either to employ operation and management staff for the day-to-day operations, or to contract a private operator in a two to five year management contract with strong commitment to the WSDBs. The CWSA encouraged larger towns with more than 12,000 inhabitants to integrate private operators for the management of the water supply systems. Two of the communities, Bekwai (Ashanti Region) and Atebubu (Brong Ahafo Region), chose a private sector involvement to run their systems (MoF, 2004).

### **Box 1.** Water supply deficiencies in a small town in Ashanti

Bekwai, a district capital with 22,000 inhabitants is located approximately 24 km south of Kumasi, in the middle of the Ashanti Highland. Bekwai's old piped water supply system was implemented in 1955 and operated under the responsibility of the GWSC. Water was extracted from the Dakran dam and treated before its distribution. The operation itself was weak and insufficient. Valves and meters at the standpipes were lacking, the pipes were exposed and unprotected. Unregistered household connections caused income decreases for the GWSC and diminished the financial fund for reinvestments. The old and rusty system caused in turn water loss and health problems as well as it provoked the use of precarious water sources and the raise of private water vendors. Water prices, therefore, depend on season and water provider, they were highly volatile.

Source: Youkhana, 2004

After feasibility studies were conducted by international consultant companies (BURGEAP, CONAN CONSULT) about the hydro-physical and socio-economic potentials of the towns, the rehabilitation of the systems were executed by the German company Dyckerhoff und Widmann AG (DYWIDAG). These water projects were EU financed and consisted of new installations for pumping ground water and abstracting surface water, tank fixing, laying of pipes and construction of distribution points. Local private companies were subcontracted by DYWIDAG to generate economic incentive for local entrepreneurs (Youkhana, 2004). The marginal areas of Bekwai and Atebubu were technically and administratively separated from the central piped system and received a particular treatment, lead by the DWST.

The entire decision making process, planning and installation of new piped systems were accompanied by the CWSA and the respective DAs. In order to ensure communal participation and to create a sense of ownership a so-called critical dialogue between decision makers and the population was drafted. Also traditional leaders from outside the centre of the town were meant to be included. With the establishment of the WSDB in 1998, also women representatives were meant to be involved. According to interviewees of the DA and WSDB, the decision to engage a private operator in a five year management contract was made in the course of this communication processes (Ibid., 2004). The so-called mobilization of the communities was declared to be one of the central parts and precondition for successful project implementation.

In fact, vested interests and political affiliation of ethnically and socially diverse groups affected the newly established and institutionally fixed water management in a specific way (Youkhana and van Edig, 2006). In the case of Bekwai, local elites occupied central positions inside the new water administration, such as the WSDB in order to abide their influence on the management of water and to stress on their privileges. By keeping up authorized control as well as by having a say in most decision making during the planning and installation phase, traditional Ashanti chiefs influenced the selection of standpipe locations to ensure their closeness for them and their families. Traditional allegiances of cognate individuals determined the course of the water project by addressing their interests preferentially and by making decisions outside the formal framework. At the same time, the community, represented by these traditional leaders in the WSDB, remained without opportunities to impose a sanction towards water users among the influential local elites with low willingness to pay for water. This in fact reduced the efficiency of the WSDB, which was in charge of solely regulatory functions but without sufficient power.

The contractual integration of a private operator in a five year management contract to operate and maintain the piped system proved to be a useful strategy to avoid major financial loss both in Bekwai and Atebubu (Youkhana, 2004). In Bekwai, it was advantageous that the Ghanaian company and most of its staff did not accrue from the town or even the Ashanti region. Consequently, they were not involved in local power plays. Legally authorized, the company was able to partly enforce water tariff payment by cutting several household

connections, the pipes of the police station respectively. This holds also true in Atebubu where larger public institutions and households with household connections displayed bad payment morality (Ibid., 2004). Other debtors, such as schools and hospitals depending on the financial allocations from the national ministries, were not exempted from such measures due to humanitarian reasons.

Both cases show that financial sustainability and necessary reinvestments into the piped system cannot be achieved if the revenues and the private companies' dues to the district (25 per cent of all profit) stay this capricious. It also retains major fears that prices for water supply under private sector involvement leads - on the medium run - to an increase of prices (compare Spalthoff and van Rooijen, 2007 for Accra water tariffs).

The case of Atebubu, where central pumps for surface water abstraction and treatment are run with diesel, financial sustainability was constraint in another way. Because of regular increase of diesel prices, irregular provision and break downs of the generator, the private operator declared to have periodical shortcomings in the execution of drinking water supply. The situation even got worse in rainy season when the users do not rely on the central distribution system and revert to unimproved water sources. The low public acceptance of the colour and taste of the highly chlorinated water added up to low revenues. As a result, the dues to DA funds for system extension, pipe renewal and sanitation were low. Even though tariffs did not yet increase the operator considered a boost in revenues by increasing prices for water (Youkhana, 2004).

The examples indicate also the importance of strong and independent regulatory agencies and a required strength of the state. In both cases, the WSDB faced a lack of means and incentives to monitor the systems properly, to impose sanctions on clients or to worry about public participation in hygiene and sanitary education. Decentralised administrative units, which are not linked-up with strong and independent regulatory authorities at higher administrative levels, have proved to be too weak to bear the requirements and responsibilities shifted to them. This holds true not just for the management of the piped systems but also for the marginal areas around the urban core area. Interviews with experts and technicians in Bekwai stressed the evidence that DWST managing the hand pumps were likewise overextended with their responsibilities. Even though the DWST received training by the RWST of the CWSA most knowledge could not be applied due to a lack of vehicles, fuel as well as funds for the employment of technicians (Youkhana, 2004).

The case of Bekwai also demonstrates that by-laws can also be used as an instrument for repression. Actually, the by-laws in Bekwai, which were formulated by the WSDB, served to scotch public worries about the involvement of a private company. Concerned citizens feared higher prices and also criticised little transparency of and exclusion from decision making processes. Therefore, a group of people decided not to contribute to the demanded 5 per cent capital costs. The WSDB responded to the worries and the refusals by holding individuals responsible and by arresting them until they paid their share of the 5 per cent community contribution (which took partly up to one year).

The way in which local opposition against private sector involvement was turned down shows that community participatory can also have a negative effect, if powerful lobbies use participatory instruments to enforce their interests. This was possible because the socio-cultural and socio-political complexity of the small town was not acknowledged by policy makers. Instead, the target group was seen as a homogenous entity and not as a community with a high level of social stratification and diverse interest. It also demonstrates how decisions are often taken and negotiated outside administrative units.

Another objection derives from the fact that there was low consideration of sanitary equipment and waste water management in both cases. These drawbacks have to be ascribed to the program of the EU funded Small Towns' Water Supply Project, whose project design did not consider the funding, installation and management of sanitary facilities.

## Community Based Management in Practice

The two GWSC Assistance Projects (GAP, 1992-00) rehabilitated the desolate technical infrastructure of thirty-four piped systems in the three Northern regions. The small towns Navrongo and Sirigu were part of the project but later got disqualified.<sup>4</sup> GAP aimed at a more sustainable management option for the water systems by involving local communities. One of the donors, CIDA, acted as a precursor for the introduction of community-based management in Ghana. A complex institutional framework for community-based management was crafted and implemented in first anticipation and later accordance with NCWSP guidelines. Unique in Ghana is the GAP child Association of Water and Sanitation Development Boards (AWSDB), an umbrella organization which assembles all thirty-six WSDBs of the three Northern Regions, including Navrongo and Sirigu. Whilst the institutional framework is the same for all GAP project towns, the local regulations differ greatly. The WSDBs are monitored and supervised by a water department of the Canadian funded District Capacity Building Project (DISCAP). Several assessments and a management optimization pilot were run by the organization, which funds capacity building for WSDB members and system operators as well as AWSDB activities. DISCAP drafted a number of by-laws, as for example a generic constitutions for WSDBs in the Northern regions, which was expected to be extended to entire Ghana at a later point in time.

Water provision in small towns relies on the piped systems as well as on hand pumps and is organized according to the the NCWSP framework. Obviously, the same policy may lead to different practical outcomes. The number of failing small town systems under the community-based management option is numerous. Some are completely dysfunctional. Others work much below their technical capacities or are not managed in a cost recovery way, which either leads to constrained water delivery or the end of the entire service. With respect to the management of hand pumps, the success of the community-based management option can be stated (e.g. Bacho, 2001; Eguavoen, 2008). This holds true despite reports of single facilities, which got captured by local elites or broke down because their users were not able to maintain the pumps (see example below). Such incidences are rather exceptional. Therefore, it is worth asking why the NCWSP policy leads to different outcomes in the rural hand pump management compared to peri-urban water system management.

### ***Box 2.*** Elite capture of borehole fees

In Atebubu, informal arrangements between DWST staff and traditional leaders bypassed the legislative framework for rural water management. Borehole fees, which were meant to be paid to the WATSAN committees for the operation and maintenance of the pumps, were delivered to the landowners, from whose land groundwater was abstracted. According to an expert at the DA, landowners and custodians of land are highly respected and have to be compensated accordingly. This practice hints to the interlinkage of water authorities and traditional leaders. Overlapping responsibilities and the fact that the rules were negotiated and introduced by people who

---

<sup>4</sup> In both towns, a WSDB had been established which persisted even though GWCL did not transfer the Navrongo water system to the community and Sirigu failed to meet the 5 per cent capital cost requirement to get the project started.

communicate in day-to-day interactions obstructed the introduction of formal institutions and new forms of accountability.

Source: Youkhana, 2004

The explanation of different performance in rural and small town settings is a conglomerate of reasons, which consists of mainly three lines of argumentation. The first line stresses the lack of management knowledge and the need for capacity building in Ghana. Generally, '[a]ll WSDB had little capacity [...] as they were deficient in designing adequate systems and procedures for efficient operation and maintenance, planning, budgeting and rational tariff setting' (Akari, 2003b: 7). 'Most of the operating staff has a fair knowledge of their routine duties [but] They are unable to trouble shoot or analyse problems that are out of ordinary' (Ibid., 2003b: 8). Our research, AWSDB investigations and DISCAP assessments indicated a common set of weak points related to WSDB capacity, including rational tariff setting, analysis of reports and book keeping. Other problems, which occurred frequently, were the insufficient number of operational staff, low and irregular payments of the operational staff as well as a lack of all kind of equipment (transportation, water treatment and water quality control, communication). Further, WSDBs had little sanction capacity towards public institutions, such as hospitals or police offices. To meet these challenges, DISCAP conducted a management optimisation pilot for small town water systems. The DISCAP pilot selected nine small towns (three per region forming three clusters), which were closely observed and studied in their performance of operation and management. For each, a detailed diagnosis was conducted about the specific problems (technical, operational, financial, and administrative as well as personnel problems). Solutions were found and implemented with the help of a DISCAP expert team, and one selected mentor for each cluster. The mentor was chosen from existing WSDB and operation teams in GAP small towns, which performed well. Mentors and system operators received training at Polytechnics. After the initial phase, regular and repetitive visits of mentors and DISCAP experts to the nine small towns took place to supervise and to support the processes on the ground. Such support included practical help in book keeping and tariff setting, technical support, teaching of task, motivation of WSDB members, negotiations with customers and community leaders as well as interference when WSDB members abused their position to monopolize information or decision making. DISCAP staff and mentors also worked as facilitators for the settling of conflicts between WSDB and operational staff. Present and former GWCL staff was planned to take over this advising role after the pilot period. A second umbrella organization, the Association of Staff of Small Town Water Systems was called into life to serve as forum for the exchange of experience and skills.

The main conclusion from the DISCAP management optimisation pilot is that WSDBs are well able to manage their systems efficiently, if they get frequently and continuously supervised and professionally supported. Countrywide, this is not yet the case; DWSTs do not show the capacity yet to perform such tandem management. In fact, the particular DWST members in Upper East Region argued that they were in charge of all areas in the district, where no WSDB operates, means they felt not in charge for small towns and piped systems. CWSA is thought to take over this role as tandem partner for communities in future (MWH/ CWSA 2004a). The close supervision through DISCAP is unique in the country and indicates the leading role of the Canadians in finding new solutions for more local sustainable water management (Akuoko-Asibey, 1996). Despite the success of the pilot, one has to admit that community-based decision-making in such tandem is limited for there are not many different options of how to manage such system technically and financially sustainable. WSDBs in the pilot in fact had the choice to agree to what was considered to be a correct management practice by the expert team, means such support is a top-down approach to some extent as well as it may be a clear external intervention in community matters.

Small towns are simply too big for community-based management. This second line of argumentation was validated by our surveys as well as by an econometric study carried out in Ghanaian small towns (Doe and Khan, 2004). Communities with a population up to 3,000 people, small household sizes, older household heads and farming as preoccupation display a better community-based water management, which the authors explained with the local participation, which gets enhanced under those circumstances. Hence, 'community management is useful for communities' development but one size [one approach] does not fit all.' they conclude (Ibid., 2004: 369). The bigger a community is, the more divergent interest occurs, the more difficult it is to organize collective action, to control each other and to avert constraining social dynamics.

The third line of argument, which is a result of our research, stresses institutional and conceptual differences between rural and small town water management under the community-based option. Water rights and local water law of a rural setting were investigated and compared with data from small town water systems. The comparison shows that there are rather continuities between the former rural management and the rural management under the NCWSP. The biggest innovation is the implementation of bounded pump communities with defined membership status instead of loose and flexible water user groups. Major conceptual and institutional changes occur between the management of hand pumps and small town water systems (Eguavoen, 2008). The community becomes abstract and is rather imagined than face-to-face. The operation, maintenance and decision making are not with the immediate water users but with a committee, the WSDB, and their technical staff. The payment of water tariffs regulates access (see figure 3).

**Figure 3.** Changing water rights and concepts in local water management

	Rural water facility management		Small towns system management under NCWSP
	before NCWSP	under NCWSP	
Ownership/ Right to own	Public - streams, shallow wells, pumps Private – wells	Public – streams, shallow wells Private – wells (owned by individuals) Communal –pumps (owned by pump communities)	Communal – piped water system (owned by DA)
	Community: Face-to-face user groups	Community: Face-to -face user groups, OR face -to-face pump communities	Community: Imagined user community
Power/ Decision- making rights	Communal – elders Private – well owner	Communal – elders Private – well owner Communal – elected committee + pump community	Communal - elected WSDB
	Minimal management by users	Minimal management by users	Professional management by WSDB and technical staff
Access/ Use rights	Public	Public – streams, shallow wells Communal – hand pumps	Private
	No payments, gifts for well owner or construction team (no impact on use rights)  Norm of non-exclusion	Community contribution/ entrance fee (impact on use right) Borehole fee /maintenance fee (no impact on use right) Norm of non-exclusion, principle of exclusion not translated into practice	Community contribution (no impact on use right) Water tariff (impact on use right)  Principle of exclusion

Source: Eguavoen

In our view, rural water management under the NCWSP is successful because local users maintained major institutional features of their former water management regime. Water users selectively integrated crafted management bodies and regulations in existing management practice instead of translating them fully in local water rights and water allocation practice. Capacity building and the introduction of easy-to-handle pumps enabled local users to carry out technical maintenance of the hand pumps. Pump committees continue to follow up a strategy of minimal management. Membership within committees tends to be stable since the introduction of the committee. Book keeping is not demanding and can even be neglected without causing problems because local systems of keeping an overview and ad hoc mechanisms for money accumulation to cover costs of repair existed (e.g. Agbenorhevi, 2005; Eguavoen 2008). Technical maintenance was hardly practiced (Akari, 2003b; Eguavoen 2008). Even though regular payments were implemented, they took the form of flat rate borehole fees, which people perceived to be maintenance fees; willingness to pay was high. Apart from the wearing out of parts, the hand pumps are a rather robust technology. Thus, the local management strategy proved to be successful by reducing external management guidelines to a minimum and avoiding this way high cost. This strategy is equal to the management of other rural water sources, such as rivers, ponds, reservoirs or shallow wells in riverbeds. As can be seen from the rural management before the NCWSP, local user groups always managed their water facilities at community level. This also holds true for the time of centralized management of rural hand pumps under GWSC (Eguavoen, 2008). Currently, there are three kinds of local or community-based management regimes existing: (a) local management of unimproved water sources which are not considered by NCWSP, (b) local management of hand pumps under NCWSP and (c) local management of small town water systems under NCWSP.

Piped water systems are very different than hand pumps. They are technically more complex than hand pumps, and require frequent resource input (such as fuel, electricity, chemicals). Still, the same minimal principles of management were observed on the ground. 'None of the water systems practiced routine maintenance of equipment and infrastructure [...] Generally, the systems break down and then they are repaired...' (Akari, 2003b: 7). This is not only a question of knowledge gaps but also of attitude, usually going hand in hand. We found that the application of existent knowledge is as crucial as the existence of knowledge itself. The application of minimal principles of management on one hand side and the construction of maximal piped systems on the other enhance the risk for technical failure. In some cases, the local participation in project planning leads to the generation of planning knowledge (Mosse, 2002), the local preference of oversized systems as well as to the rejection of smaller and easier-to-handle systems, entailing higher construction as well as higher operation cost (Eguavoen, 2008).

Empirically, community ownership means very different things according to the context. A hand pump is owned by a number of compound houses, which are the immediate water users, whereby in a small town system, the communal ownership is with the administrative entity, and not with the immediate users as such. The user community is rather imagined. It includes all inhabitants of the small town – even people living at its periphery and depending completely on rural water facilities. Often, the pump communities in the catchment of a piped system are denied their former ownership, use and decision-making rights because these rights are transferred to the DA and the water supply is then managed by the local WSDB. Even though communal ownership remains, the property relations have practically changed by expropriating the pump communities or by the sale of rights from the pump community to the district or small town. Thus, the legal framework in this case at the same time destroys what it supports –

the direct ownership of water supply facilities by the immediate users. Instead of decentralizing the water management, it transfers responsibility from state to local WSDBs (decentralization) but at the same time, management rights are shifted from rural pump communities to central small town WSDB (centralization).

The ignorance of contradictory concepts under the same terminology may lead to questionable outcomes as in the extreme case of Navrongo (Upper East Region) where the GWCL continues to manage the piped system and the WSDB acts as the central management authority for the hand pumps in town. Pump committees have to report and transfer their borehole fees to the WSDB. These funds are then transferred to central AWSDB accounts in Tamale (Northern Region). In case of required pump repair, funds have to be requested back formally via the Navrongo WDSB from the AWSDB. The AWSDB executive decides about the request and transfers money back to the WSDB account. Then, the WSDB either allocates the money to the pump committee or pays spare parts and mechanics without involvement of the water users. In this extreme case, the administrative effort has increased despite the introduction of community-based management.

Conceptual and institutional differences, which occur with the introduction of a piped system to a peri-urban setting, are ignored at policy level, where the change from a rural to a small town management system is argued simplistically in terms of technical and institutional up-scaling. Empirically, this is not the case. A more differentiated view and policy and the recognition of continuities in local water management could be the key to tackle two different management challenges in a more specific way.

## Conclusion

The described realities of restructured water management show that many small towns have experienced two or three management options succeeding each other without bringing a crucial improvement in service. None of the two focused management options have proved to be the optimal solution. Both comprise some opportunities as well as some constraints. Community-based water management in Ghana lacks in general the knowledge and human capacities to run the supply systems efficiently. But decentralized administrative bodies may run their systems successfully if receiving frequent and continuous supervision and financial support. Thus, communities need to get sufficient back-up by better regulatory institutions in order to have a say at higher administrative level. An administrative tandem has proved to be a useful tool for increasing the administrative effectiveness due to better information and participation of local agents in the development and management process. Whilst such tandem approach was used efficiently in CIDA/ DISCAP water projects in the three Northern Regions, the WSDB in the communities in Ashanti and Brong-Ahafo Region could not make use of umbrella institutions, such as the AWSDB to pursue their interests. The cases show that districts were simply overburdened with the requirements under the new water legislation, but mainly left unescorted.

The presented cases also refer to the importance of community-size for the success of community-based water management strategies. Our data gives evidence for the assumption small towns respectively face difficulties to maintain their systems whilst rural pump communities demonstrate more prospect of success because they take advantage of institutional features of former management regimes before NCWSP.

Socio-political complexity affects the water restructuring process especially in towns where it is more difficult to organize collective action and monitor the piped system. The variety

of institutions and actors can then lead to a situation where decisions are partly made outside formal arrangements and legal specifications. As we have seen in the case of Bekwai and Atebubu, elites could use newly established water institutions for their own benefit.

Likewise, the case studies show that the described drawbacks can be encountered by a private operator with external staff without personal commitments to local elites. Thus, the involvement of a private operator in a short-term management contract makes sense if water system management is affected by local power struggles. In our cases, the private operator has proved to be independent from the power plays of a community. The less he is involved the better he can manage the system and the stronger he can influence the payment practice and can even impose sanctions on debtors. This conclusion was again approved at the example of Bekwai and Atebubu. Nevertheless, prices for water supply under private sector involvement are adjusted to the revenues of the operator and do increase respectively. For this reason, it is indispensable to strengthen the role of independent regulatory institutions at local level.

Our research hints at the broadly ignored importance of sanitary and hygiene aspects in water management. Each of the investigated small towns had inadequate sanitary facilities - a drawback that was not adequately picked up by development programmes. Sanitary aspects and hygiene education is actually part of any sustainable water management strategy (MoWH, 2004). It was expected that WSDB members fulfil their tasks voluntarily. Due to lack of incentive and constraints in their economic activities, women in Bekwai, for example, refused to work in the area of sanitary and hygiene education. Consequently, the WSDB complained about the little representation of women. In case of the Small Town Water Supply Project, the installation of sanitary infrastructure was not even provided. Instead, the construction of sanitary facilities was supposed to result from a water sales contingent, administered by the DA. The district administration concentrated its endeavours on the extension of the piped systems.

Against the background of the described weaknesses we still believe that both management options can be favourable when the pitfalls are encountered by respective measures and applied to the appropriate local context. The experiences from Ghana permit the following suggestions for community-based water management:

- Empirical observation of institutional development, inter alia, institutional drawbacks or unintended outcomes on the ground.
- Clear determination of legal status of community-based management bodies.
- Extension of umbrella organizations for exchange of skills and experience to other regions (for WSDBs and system operators).
- Continuous supervision and practical support of WSDBs by water professionals (CWSA and/ or GWCL professionals).

It was shown that community participation understood as a means to an end or as a goal of development can both lead to drawbacks in water development when some premises are not accomplished. Despite this, we think that community participation as a policy concept should not be dismissed. The concept as such has no alternative in terms of the integration of different interest and water user groups. But this paper intended to sensitize for a more critical view on participatory water development and its implications for the respective communities. Without professional supervision and support, larger communities cannot cope with the imposed responsibilities. The transfer of power to more local and decentralized management bodies should be the principal claim of any development initiative. However, it should not be used to push all responsibility and costs to the communities. Regulatory functions and the mandate for capacity building need to stay under the liability of the state. Responsibility for such an important good like water should not be shifted to local volunteers with the unrealistic

expectation that they could manage it as efficient as a professional enterprise. The question of capacity is one crucial component for the failure of community-based management. That has been recognized on donor level and they integrate community capacity building as an integral part of their water projects. What has not been acknowledged in policy and practice is the complex mix of social, economic, cultural and political realities which do not allow the application of one management strategy to all water systems.

## Abbreviations

AWSDB	Association of Water and Sanitation Development Boards
CIDA	Canadian International Development Agency
CWSA	Community Water and Sanitation Agency
DA	District Administration
DISCAP	District Capacity Building Project
DWST	District Water and Sanitation Team
EPA	Environmental Protection Agency
EU	European Union
GAP	GWSC Assistance Project
GWCL	Ghana Water Company Limited
GWSC	Ghana Water and Sewage Corporation
MoF	Ministry of Finance
MoWH	Ministry of Works and Housing
NCWSP	National Community Water and Sanitation Program
PPP	Public Private Partnership
PURC	Public Utilities Regulatory Commission
RWST	Regional Water and Sanitation Team
WATSAN	Water and Sanitation Committee
WRC	Water Resources Commission
WSDB	Water and Sanitation Development Board

## References

- Agbenorhevi, M. (2005) 'Informal savings mechanisms for maintaining a rural water system, Ghana', *Waterlines* 24: 8-9.
- Akari, P. L. (2003a) 'Orientation Paper on Operations and Maintenance of Handpumps and Small Town Water Systems in Northern Ghana. Volume I. Strategy for Operation and Maintenance' DISCAP document, Bolgatanga.
- Akari, P. L. (2003b) 'Orientation Paper on Operations and Maintenance of Handpumps and Small Town Water Systems in Northern Ghana. Volume II. Current Operation and Maintenance Practices' DISCAP document, Bolgatanga.
- Akari, P. L. (2003c) 'Orientation Paper on Operations and Maintenance of Handpumps and Small Town Water Systems in Northern Ghana. Volume III. Supporting Documents' DISCAP document, Bolgatanga.
- Akuoko-Asibey, A. (1996) 'A summative evaluation of a rural water supply programme in Ghana' *Applied Geography* 16: 243-256.
- Bacho, F.Z.L. (2001) *Infrastructure delivery under poverty. Potable water provision through collective action.* Dortmund: SPRING.
- Borza, J.L. (2002) 'Water Abstraction, Treatment and Supply: Case Study Sandema, Builsa district' AWSDB report.
- Chambers, R. (1997) *Whose Reality Counts? Putting the First Last.* London: IT Publications.
- Cooke, B. and U. Kotari (eds) (2002) *Participation. The new Tyranny?* London/ New York: Zed Books.
- DISCAP (2004a) 'Assessing Institutional Arrangements in Community-based Management of Water and Sanitation in Northern Ghana. A concept note.
- DISCAP (2004b) 'Final Generic By-law for the Establishment and Operation of Water and Sanitation Development Boards Prepared for District Assembly Adoption.' DISCAP document, Bolgatanga.
- Doe, S. R. and M.S. Khan (2004) 'The boundaries and limits of community management. Lessons from the water sector in Ghana' *Community Development* 49: 360-371.
- Eguavoen, I. (2008) *Now you have a new pump, you have to manage it. Household water in Northern Ghana.* Berlin: Lit.
- Eguavoen I. and D. Spalthoff (2008) 'The right way to ensure access? Human right, local water right regimes and right-based discourses against the privatization of water in Ghana', in: P.P. Mollinga, A. Bhat and S. Subramaniam (eds) *Water Policy and Development.* Berlin: Lit.
- Fact Finding Mission (FFM 2002) *Report of the International Fact Finding Mission on water sector reform in Ghana, Accra/ Washington.*

Fuest, V. (2006) Demand-oriented Community Water Supply in Ghana - policies, practices and outcomes, Berlin: Lit.

Fuest, V. and S. Haffner (2007) 'PPP in urban water supply - policies, practices and problems in Ghana' Water Policy 9, pp.169-192.

GoG/ MoWH (1999) 'Ghana Water Vision 2025'.

GoG/ MoWH (2004) 'Community Water and Sanitation Agency. Implementation Plan: CWSP-2 Small Towns Water Supply and Sanitation Project (2005-2008)'.

GoG (1998) 'Community Water and Sanitation Agency Act, Act 564'.

Jahns, J. and K. Burckhart (2003a) 'Water Abstraction, Treatment and Supply: case study Bimbilla, Nanumba district' AWSDB report.

Jahns, J. and K. Burckhart (2003b) 'Water Abstraction, Treatment and Supply: Case Study Saboba, Chereponi district' AWSDB report.

Jahns, J. and K. Burckhart (2003c) 'Water Abstraction, Treatment and Supply: Case Study Salaga, East Gonja district' AWSDB report.

Jahns, J. and K. Burckhart (2003d) 'Water Abstraction, Treatment and Supply: Case Study Zabzugu, Tatale district' AWSDB report.

Laube, W. und N. van de Giesen (2006) 'Ghanaian Water Reforms. Institutional and Hydrological Perspectives', in J. Wallace and P. Wouters (eds) Hydrology and Water Law – Bridging the Gap, Clouver.

Lautze, J., B. Barry and E. Youkhana (2006) 'Changing Interfaces in Volta Basin Water Management: Customary, National and Transboundary' ZEF Working Paper Series 16, Bonn.

MoF (2004). 'Small Towns Water Supply Project in Ashanti, Brong-Ahafo and Western Regions. Final report (Draft)' Accra.

Mosse, D. (2002) 'Participation and Patronage', in B. Cooke and U. Kotari (eds) ) Participation. The new Tyranny?, pp. 16-35, London; New York: Zed Books.

MoWH (1998) 'Ghana's water resources: management challenges and opportunities' Accra.

MoWH (2001a) 'Ghana Water Policy' Accra.

MoWH (2001b) 'Community Water and Sanitation Agency. Annual report.' Accra.

MoWH (2002a): 'Background Paper on Water Resources Management and Ghana Poverty Reduction Strategy. Final Report' Accra.

MoWH (2002b) 'Community Water and Sanitation Agency. Annual report.' Accra.

MoWH (2003) 'Second quarter progress report on the activities of the Community Water and Sanitation Agency from April 1, 2003 to June 30, 2003' Accra.

MoWH/ CWSA (2004). 'Small Town Sector Policy.' Accra.

PPIAF/ CWSA (2003) 'Study on the private sector participation in small towns water supply. Final report. Vol. I.

PURC (2007) Homepage. <http://www.purc.com.gh/aboutUs.php?pid=abt1> (13.12.2007)

Rathbone, R. (2000) Nkrumah and the Chiefs. The Politics of Chieftaincy in Ghana 1951-60, Oxford: James Currey.

Sandoz, S. (2005) 'Concept Note on Optimization Strategy for Small Town Water Supply Systems in Northern Ghana', DISCAP document, Bolgatanga.

Schiffer, E. (2004) 'Community-based Natural Resource Management in Namibia: How does it Influence Local Governance?'. PhD dissertation, University of Bochum.

Schouten, T. and P. Moriarty (2003) Community Water, Community Management. From System to Service in Rural Area, London: ITDG Publishing.

Spalthoff, D. and D. van Rooijen (2007) 'Domestic Water Supply in Accra. Drawing the physical setting and social aspects'. Unpublished paper. Center for Development Research. Bonn.

Van Edig A., W. Laube and N. van de Giesen (2002) 'Internationale und nationale Wasserkonflikte: Institutionelle und rechtliche Hintergründe der Wassernutzung des Volta-Flusses am Beispiel Ghanas', in G. Meyer, R. Pütz, and A. Thimm (eds) Wasserkonflikte in der Dritten Welt. Veröffentlichungen des interdisziplinären Arbeitskreises Dritte Welt, Band 15, pp. 75-94, Mainz.

Van Edig, A., S. Engel and W. Laube (2003) 'Ghana's water institutions in the process of reforms: from the international to the local level, in: S. Neubert et al. (eds) Reforming Institutions for Sustainable Water Management. pp. 31-50, Bonn: German Development Institute.

WHO/ UNICEF (2000) 'Water Supply and Sanitation Sector Assessment Part II' [www.whoafr.org/wsh/countryprofiles/ghana.pdf](http://www.whoafr.org/wsh/countryprofiles/ghana.pdf) (20.07.2006)

World Bank (2004) 'Project appraisal document proposed to the government of Ghana for Small Towns Water Supply and Sanitation Project in support of the second phase of the Community Water and Sanitation Program.

Youkhana, E. (2004) 'EU financed Small Towns Water Supply Project (STWSP) in Ghana. The Case Study of Bekwai. Unpublished field report. Center for Development Research, Bonn.

Youkhana, E. and A. van Edig (2006) 'Aufbau lokaler Strukturen im Wassersektor. Anspruch und Wirklichkeit des Wasserreformprozesses am Beispiel der kleinstädtischen Trinkwasserversorgung in Ghana', in S. Miehlau and F. Wickl (eds) Lokales Wissen und Entwicklung, Bad Honnef: Horlemann Verlag.

Youkhana (2007) Experiment Ökotourismus – Gelenkter Wandel und Akzeptanz am Beispiel des Mayadorfs Yaxuná in Mexiko, Frankfurt a.M.: IKO Verlag.

- 1 Evers, Hans-Dieter and Solvay Gerke (2005). Closing the Digital Divide: Southeast Asia's Path Towards a Knowledge Society.
- 2 Bhuiyan, Shajahan and Hans-Dieter Evers (2005). Social Capital and Sustainable Development: Theories and Concepts.
- 3 Schetter, Conrad (2005). Ethnicity and the Political Reconstruction of Afghanistan.
- 4 Kassahun, Samson (2005). Social Capital and Community Efficacy. In Poor Localities of Addis Ababa Ethiopia.
- 5 Fuest, Veronika (2005). Policies, Practices and Outcomes of Demand-oriented Community Water Supply in Ghana: The National Community Water and Sanitation Programme 1994 – 2004.
- 6 Menkhoff, Thomas and Hans-Dieter Evers (2005). Strategic Groups in a Knowledge Society: Knowledge Elites as Drivers of Biotechnology Development in Singapore.
- 7 Mollinga, Peter P. (2005). The Water Resources Policy Process in India: Centralisation, Polarisation and New Demands on Governance.
- 8 Evers, Hans-Dieter (2005). Wissen ist Macht: Experten als Strategische Gruppe.
- 8a Evers, Hans-Dieter and Solvay Gerke (2005). Knowledge is Power: Experts as Strategic Group.
- 9 Fuest, Veronika (2005). Partnerschaft, Patronage oder Paternalismus? Eine empirische Analyse der Praxis universitärer Forschungskoooperation mit Entwicklungsländern.
- 10 Laube, Wolfram (2005). Promise and Perils of Water Reform: Perspectives from Northern Ghana.
- 11 Mollinga, Peter P. (2004). Sleeping with the Enemy: Dichotomies and Polarisation in Indian Policy Debates on the Environmental and Social Effects of Irrigation.
- 12 Wall, Caleb (2006). Knowledge for Development: Local and External Knowledge in Development Research.
- 13 Laube, Wolfram and Eva Youkhana (2006). Cultural, Socio-Economic and Political Constraints for Virtual Water Trade: Perspectives from the Volta Basin, West Africa.
- 14 Hornidge, Anna-Katharina (2006). Singapore: The Knowledge-Hub in the Straits of Malacca.
- 15 Evers, Hans-Dieter and Caleb Wall (2006). Knowledge Loss: Managing Local Knowledge in Rural Uzbekistan.
- 16 Youkhana, Eva, Lautze, J. and B. Barry (2006). Changing Interfaces in Volta Basin Water Management: Customary, National and Transboundary.
- 17 Evers, Hans-Dieter and Solvay Gerke (2006). The Strategic Importance of the Straits of Malacca for World Trade and Regional Development.
- 18 Hornidge, Anna-Katharina (2006). Defining Knowledge in Germany and Singapore: Do the Country-Specific Definitions of Knowledge Converge?
- 19 Mollinga, Peter M. (2007). Water Policy – Water Politics: Social Engineering and Strategic Action in Water Sector Reform.
- 20 Evers, Hans-Dieter and Anna-Katharina Hornidge (2007). Knowledge Hubs Along the Straits of Malacca.
- 21 Sultana, Nayeem (2007). Trans-National Identities, Modes of Networking and Integration in a Multi-Cultural Society. A Study of Migrant Bangladeshis in Peninsular Malaysia.
- 22 Yalcin, Resul and Peter M. Mollinga (2007). Institutional Transformation in Uzbekistan's Agricultural and Water Resources Administration: The Creation of a New Bureaucracy.
- 23 Menkhoff, T., Loh, P. H. M., Chua, S. B., Evers, H.-D. and Chay Yue Wah (2007). Riau Vegetables for Singapore Consumers: A Collaborative Knowledge-Transfer Project Across the Straits of Malacca.
- 24 Evers, Hans-Dieter and Solvay Gerke (2007). Social and Cultural Dimensions of Market Expansion.
- 25 Obeng, G. Y., Evers, H.-D., Akuffo, F. O., Braimah, I. and A. Brew-Hammond (2007). Solar PV Rural Electrification and Energy-Poverty Assessment in Ghana: A Principal Component Analysis.
- 26 Eguavoen, Irit; E. Youkhana (2008). Small Towns Face Big Challenge. The Management of Piped Systems after the Water Sector Reform in Ghana.
- 27 Evers, Hans-Dieter (2008). Knowledge Hubs and Knowledge Clusters: Designing a Knowledge Architecture for Development
- 28 Ampomah, Ben Y., Adjei, B. and E. Youkhana (2008). The Transboundary Water Resources Management Regime of the Volta Basin.
- 29 Saravanan.V.S.; McDonald, Geoffrey T. and Peter P. Mollinga (2008). Critical Review of Integrated Water Resources Management: Moving Beyond Polarised Discourse.
- 30 Laube, Wolfram; Awo, Martha and Benjamin Schraven (2008). Erratic Rains and Erratic Markets: Environmental change, economic globalisation and the expansion of shallow groundwater irrigation in West Africa.
- 31 Mollinga, Peter P. (2008). For a Political Sociology of Water Resources Management.
- 32 Hauck, Jennifer; Youkhana, Eva (2008). Histories of water and fisheries management in Northern Ghana.
- 33 Mollinga, Peter P. (2008). The Rational Organisation of Dissent. Boundary concepts, boundary objects and boundary settings in the interdisciplinary study of natural resources management.
- 34 Evers, Hans-Dieter; Gerke, Solvay (2009). Strategic Group Analysis.
- 35 Evers, Hans-Dieter; Benedikter, Simon (2009). Strategic Group Formation in the Mekong Delta - The Development of a Modern Hydraulic Society.
- 36 Obeng, George Yaw; Evers, Hans-Dieter (2009). Solar PV Rural Electrification and Energy-Poverty: A Review and Conceptual Framework With Reference to Ghana.
- 37 Scholtes, Fabian (2009). Analysing and explaining power in a capability perspective.
- 38 Eguavoen, Irit (2009). The Acquisition of Water Storage Facilities in the Abay River Basin, Ethiopia.
- 39 Hornidge, Anna-Katharina; Mehmood Ul Hassan; Mollinga, Peter P. (2009). 'Follow the Innovation' – A joint experimentation and learning approach to transdisciplinary innovation research.
- 40 Scholtes, Fabian (2009). How does moral knowledge matter in development practice, and how can it be researched?
- 41 Laube, Wolfram (2009). Creative Bureaucracy: Balancing power in irrigation administration in northern Ghana.
- 42 Laube, Wolfram (2009). Changing the Course of History? Implementing water reforms in Ghana and South Africa.

- 43 Scholtes, Fabian (2009). Status quo and prospects of smallholders in the Brazilian sugarcane and ethanol sector: Lessons for development and poverty reduction.
- 44 Evers, Hans-Dieter, Genschick, Sven, Schraven, Benjamin (2009). Constructing Epistemic Landscapes: Methods of GIS-Based Mapping.
- 45 Saravanan V.S. (2009). Integration of Policies in Framing Water Management Problem: Analysing Policy Processes using a Bayesian Network.
- 46 Saravanan V.S. (2009). Dancing to the Tune of Democracy: Agents Negotiating Power to Decentralise Water Management.
- 47 Huu, Pham Cong, Rhlers, Eckart, Saravanan, V. Subramanian (2009). Dyke System Planing: Theory and Practice in Can Tho City, Vietnam.
- 48 Evers, Hans-Dieter, Bauer, Tatjana (2009). Emerging Epistemic Landscapes: Knowledge Clusters in Ho Chi Minh City and the Mekong Delta.
- 49 Reis, Nadine; Mollinga, Peter P. (2009). Microcredit for Rural Water Supply and Sanitation in the Mekong Delta. Policy implementation between the needs for clean water and 'beautiful latrines'.
- 50 Gerke, Solvay; Ehlert, Judith (2009). Local Knowledge as Strategic Resource: Fishery in the Seasonal Floodplains of the Mekong Delta, Vietnam
- 51 Schraven, Benjamin; Eguavo, Irit; Manske, Günther (2009). Doctoral degrees for capacity development: Results from a survey among African BiGS-DR alumni.
- 52 Nguyen, Loan (2010). Legal Framework of the Water Sector in Vietnam.
- 53 Nguyen, Loan (2010). Problems of Law Enforcement in Vietnam. The Case of Wastewater Management in Can Tho City.
- 54 Oberkircher, Lisa et al. (2010). Rethinking Water Management in Khorezm, Uzbekistan. Concepts and Recommendations.
- 55 Waibel, Gabi (2010). State Management in Transition: Understanding Water Resources Management in Vietnam.
- 56 Saravanan V.S., Mollinga, Peter P. (2010). Water Pollution and Human Health. Transdisciplinary Research on Risk Governance in a Complex Society.
- 57 Vormoor, Klaus (2010). Water Engineering, Agricultural Development and Socio-Economic Trends in the Mekong Delta, Vietnam.
- 58 Hornidge, Anna-Katharina, Kurfürst, Sandra (2010). Envisioning the Future, Conceptualising Public Space. Hanoi and Singapore Negotiating Spaces for Negotiation.
- 59 Mollinga, Peter P. (2010). Transdisciplinary Method for Water Pollution and Human Health Research.
- 60 Youkhana, Eva (2010). Gender and the development of handicraft production in rural Yucatán/Mexico.
- 61 Naz, Farhat, Saravanan V. Subramanian (2010). Water Management across Space and Time in India.
- 62 Evers, Hans-Dieter, Nordin, Ramli, Nienkemoer, Pamela (2010). Knowledge Cluster Formation in Peninsular Malaysia: The Emergence of an Epistemic Landscape.
- 63 Mehmood Ul Hassan, Hornidge, Anna-Katharina (2010). 'Follow the Innovation' – The second year of a joint experimentation and learning approach to transdisciplinary research in Uzbekistan.
- 64 Mollinga, Peter P. (2010). Boundary concepts for interdisciplinary analysis of irrigation water management in South Asia.
- 65 Noelle-Karimi, Christine (2006). Village Institutions in the Perception of National and International Actors in Afghanistan. (Amu Darya Project Working Paper No. 1)
- 66 Kuzmits, Bernd (2006). Cross-bordering Water Management in Central Asia. (Amu Darya Project Working Paper No. 2)
- 67 Schetter, Conrad, Glassner, Rainer, Karokhail, Masood (2006). Understanding Local Violence. Security Arrangements in Kandahar, Kunduz and Paktia. (Amu Darya Project Working Paper No. 3)
- 68 Shah, Usman (2007). Livelihoods in the Asqalan and Sufi-Qarayateem Canal Irrigation Systems in the Kunduz River Basin. (Amu Darya Project Working Paper No. 4)
- 69 ter Steege, Bernie (2007). Infrastructure and Water Distribution in the Asqalan and Sufi-Qarayateem Canal Irrigation Systems in the Kunduz River Basin. (Amu Darya Project Working Paper No. 5)
- 70 Mielke, Katja (2007). On The Concept of 'Village' in Northeastern Afghanistan. Explorations from Kunduz Province. (Amu Darya Project Working Paper No. 6)
- 71 Mielke, Katja, Glassner, Rainer, Schetter, Conrad, Yarash, Nasratullah (2007). Local Governance in Warsaj and Farkhar Districts. (Amu Darya Project Working Paper No. 7)
- 72 Meininghaus, Esther (2007). Legal Pluralism in Afghanistan. (Amu Darya Project Working Paper No. 8)
- 73 Yarash, Nasratullah, Smith, Paul, Mielke, Katja (2010). The fuel economy of mountain villages in Ishkamish and Burka (Northeast Afghanistan). Rural subsistence and urban marketing patterns. (Amu Darya Project Working Paper No. 9)
- 74 Oberkircher, Lisa (2011). 'Stay – We Will Serve You Plov!'. Puzzles and pitfalls of water research in rural Uzbekistan.
- 75 Shtaltovna, Anastasiya, Hornidge, Anna-Katharina, Mollinga, Peter P. (2011). The Reinvention of Agricultural Service Organisations in Uzbekistan – a Machine-Tractor Park in the Khorezm Region.
- 76 Stellmacher, Till, Grote, Ulrike (2011). Forest Coffee Certification in Ethiopia: Economic Boon or Ecological Bane?

## ZEF Development Studies

edited by Solvay Gerke and Hans-Dieter Evers

Center for Development Research (ZEF),  
University of Bonn

Shahjahan H. Bhuiyan

*Benefits of Social Capital. Urban Solid Waste Management in Bangladesh*

Vol. 1, 2005, 288 p., 19.90 EUR, br. ISBN 3-8258-8382-5

Veronika Fuest

*Demand-oriented Community Water Supply in Ghana. Policies, Practices and Outcomes*

Vol. 2, 2006, 160 p., 19.90 EUR, br. ISBN 3-8258-9669-2

Anna-Katharina Hornidge

*Knowledge Society. Vision and Social Construction of Reality in Germany and Singapore*

Vol. 3, 2007, 200 p., 19.90 EUR, br. ISBN 978-3-8258-0701-6

Wolfram Laube

*Changing Natural Resource Regimes in Northern Ghana. Actors, Structures and Institutions*

Vol. 4, 2007, 392 p., 34.90 EUR, br. ISBN 978-3-8258-0641-5

Lirong Liu

*Wirtschaftliche Freiheit und Wachstum. Eine internationale vergleichende Studie*

Vol. 5, 2007, 200 p., 19.90 EUR, br. ISBN 978-3-8258-0701-6

Phuc Xuan To

*Forest Property in the Vietnamese Uplands. An Ethnography of Forest Relations in Three Dao Villages*

Vol. 6, 2007, 296 p., 29.90 EUR, br. ISBN 978-3-8258-0773-3

Caleb R.L. Wall, Peter P. Mollinga (Eds.)

*Fieldwork in Difficult Environments. Methodology as Boundary Work in Development Research*

Vol. 7, 2008, 192 p., 19.90 EUR, br. ISBN 978-3-8258-1383-3

Solvay Gerke, Hans-Dieter Evers, Anna-K. Hornidge (Eds.)

*The Straits of Malacca. Knowledge and Diversity*

Vol. 8, 2008, 240 p., 29.90 EUR, br. ISBN 978-3-8258-1383-3

Caleb Wall

*Argorods of Western Uzbekistan. Knowledge Control and Agriculture in Khorezm*

Vol. 9, 2008, 384 p., 29.90 EUR, br. ISBN 978-3-8258-1426-7

Irit Eguavoen

*The Political Ecology of Household Water in Northern Ghana*

Vol. 10, 2008, 328 p., 34.90 EUR, br. ISBN 978-3-8258-1613-1

Charlotte van der Schaaf

*Institutional Change and Irrigation Management in Burkina Faso. Flowing Structures and Concrete Struggles*

Vol. 11, 2009, 344 p., 34.90 EUR, br. ISBN 978-3-8258-1624-7

Nayeem Sultana

*The Bangladeshi Diaspora in Peninsular Malaysia. Organizational Structure, Survival Strategies and Networks*

Vol. 12, 2009, 368 p., 34.90 EUR, br. ISBN 978-3-8258-1629-2

Peter P. Mollinga, Anjali Bhat, Saravanan V.S. (Eds.)

*When Policy Meets Reality. Political Dynamics and the Practice of Integration in Water Resources Management Reform*

Vol. 13, 216 p., 29.90 EUR, br., ISBN 978-3-643-10672-8

Irit Eguavoen, Wolfram Laube (Eds.)

*Negotiating Local Governance. Natural Resources Management at the Interface of Communities and the State*

Vol. 14, 248 p., 29.90 EUR, br., ISBN 978-3-643-10673-5

William Tsuma

*Gold Mining in Ghana. Actors, Alliances and Power*

Vol. 15, 2010, 256 p., 29.90 EUR, br., ISBN 978-3-643-10811-1

Thim Ly

*Planning the Lower Mekong Basin: Social Intervention in the Se San River*

Vol. 16, 2010, 240 p., 29.90 EUR, br., ISBN 978-3-643-10834-0