

Full Length Research Paper

Community involvement in urban water and sanitation provision: The missing link in partnerships for improved service delivery in Ghana

Issaka Kanton Osumanu

Department of Environment and Resource Studies, University for Development Studies,
P. O. Box 520, Wa, Ghana. E-mail: osmankanton@yahoo.co.uk.

Accepted 8 September, 2010

This paper examined how partnerships with communities can complement government's efforts at improving access to adequate water supply and improved sanitation in urban areas of Ghana, using a descriptive cross-sectional study of the experiences of four communities selected from three regions in the country. The paper concludes that an active involvement of the user community in the planning and provision of such services could contribute to greater equity and financial viability and would, in turn, attract greater private sector participation in the sector. It recommends sustained efforts in information sharing, consultations and capacity building as requirements for realizing an active community participation in the provision of urban water and sanitation services in Ghana.

Key words: Partnership, sanitation, urban Ghana, user community, water, efficiency.

INTRODUCTION

A major problem of water supply and sanitation provision in cities in Africa is the inability of governments and public utilities to deliver and maintain basic infrastructure services for their growing populations (UNDP, 2006). As an outcome, many urban households have access to potable water only two hours in two to three days, and water consumption in some areas barely reaches the internationally recognized minimum of 20-25 L per capita per day, and almost half of Africa's urban population does not have access to adequate sanitation (UNDP, 2006). In Ghana, only 30% of urban households have pipe connections into their dwellings and 22% uses flush toilets while 5% uses the bush/beach (Ghana Statistical Service, 2008). In order to improve the performance of the urban water and sanitation sectors, Public-Private Partnerships (PPPs) in the provision and management of services are being increasingly promoted. These partnerships are mainly geared towards streamlining the role, functions, and decision-making processes of actors within the sectors. Notable among them is the urban water reform policy (Mensah, 1999), which transformed the Ghana Water and Sewerage Corporation (GWSC) into a limited liability company – Ghana Water Company Limited (GWCL), as one of the many steps for introducing the private sector to the management and operation of

urban water supply systems in Ghana. As part of the reforms, the regulation of urban water supply has been shifted away from government to an independent body, the Public Utilities Regulatory Commission (PURC), which is mandated to regulate and oversee urban water supply, including approving tariff levels and ensuring the provision of quality treated water to consumers. By transforming GWSC into a potentially profitable urban water supply system, the same policy also shifted responsibility for sanitation and wastewater management to the impoverished local governments (District/Municipal/Metropolitan Assemblies).

The private sector is expected to implement effective management, improve quality of supply, provide investment in refurbishment of networks and plant, provide sustainable water supply and improved sanitation and bring investment to extend services. While private participation in water supply and sanitation services is likely to bring in new investment capital, management and organizational skills, and technical know-how criticisms are often labeled against private utilities for what has become known as a bias towards meeting the demands of upper and middle income groups and for not being responsive to ensure equality of access to the service for all segments of the civil society (Kalyan and

Table 1. Study areas.

Community	Location	Population (2005)	Main source of drinking water supply	Dominant type of toilet facility
Old Fadama	Accra Metropolitan Area, Greater Accra Region	37,246	Pipe water from vendors (86.2%)	Public latrines (48.7%)
Sukura	Accra Metropolitan Area, Greater Accra Region	24,842	Pipe water from vendors (64.3%)	Public latrines (56.8)
New Takoradi	Takoradi Metropolitan Area, Western Region	16,497	Pipe water from vendors (91.6%)	Beach (54.7%)
Lamahegu	Tamale Metropolitan Area, Northern Region.	36,028	Public outdoor pipe (41%)	Bush (30.7%)

Source: Ghana Statistical Service (2008).

akebeeke, 1995; Franceys, 1997). A key factor which contributes to this bias is the popular misconception that communities in low-income urban settlements are unable or unwilling to pay for water-related services. In reality, these communities pay many times more for inferior services than their counterparts do in the more affluent neighborhoods (Whittington et al., 1998; McGranahan et al., 2001). Additionally, African governments tend to be poorly equipped to deal with what is, for some, a new way of working (Batcher and Scott, 2001), and the institutional framework needed to facilitate the promised synergy between public and private entities is often lacking. No matter how much operational responsibility is shifted onto the private sector overall responsibility for ensuring that water and sanitation services are provided remains with the government. Therefore, as private sector involvement increases, the government's role (at both national and local levels) needs to shift more from implementer to regulator to allow private capital flows and technological innovations for improved service delivery. Public participation has therefore become the key to Ghana's approach to sustainable water and sanitation provision. However, most attention in discussions on Public-Private Partnerships (PPPs) have focused on the contribution of the 'formal' enterprises and ignored 'informal' forms of participation in existence, such as different forms of community-based water supply and sanitation providers. Little effort has been made to harness the full potential of community-driven initiatives in the water and sanitation sector. At the moment, communities seem to be involved in water and sanitation management in rural areas and small towns, but much less in the large urban centers. Indeed, the Ghana Water and Sanitation Policy, which was introduced in 1993, encourage community participation only in rural areas (Ghana, 1993):

"The new water and sanitation policy aims at ensuring sustainability of the water and sanitation facilities provided through a demand responsive approach and a shift from the dependence on

government towards self-reliance by user communities. For rural areas, the policy is provision of services through community participation in terms of ownership and management of the facilities."

At best, community involvement in urban areas tends to be restricted to benefit sharing activities, which are unrelated to core business activities. This paper examines how user communities, as 'informal' service providers, can supplement the role of formal service providers and can build useful partnerships with the public and private sectors, particularly in addressing the service needs of low-income urban communities. Although participatory approaches offer widespread benefits, the paper is primarily concerned with the participation of the urban poor in public-private partnerships (PPPs) in water and sanitation systems. The wealthy are generally able to articulate their concerns, but it is to the poor, who constitute a non-standard group of consumers, that participatory approaches offer greatest benefit. Specifically the objectives of the paper are to:

1. Identify major players in the urban water and sanitation sector in Ghana;
2. Describe the nature and significance of community-based water and sanitation systems in Urban Ghana; and
3. Identify opportunities and constraints to community participation in urban water and sanitation services.

METHODOLOGY

The communities covered in the study are four low-income urban communities (Table 1) - Old Fadama and Sukura, from the Accra Metropolitan Area - Ghana's biggest, most diverse and most cosmopolitan city, New Takoradi in the Takoradi Metropolitan Area - the most highly developed of the 13 districts of the Western Region and Lamashegu in the Tamale Metropolitan Area - the country's third largest urban centre in terms of population. These communities are made up of peoples of various ethnic and religious backgrounds most of who are engaged in petty trading and small-scale businesses, while others are civil/public servants.

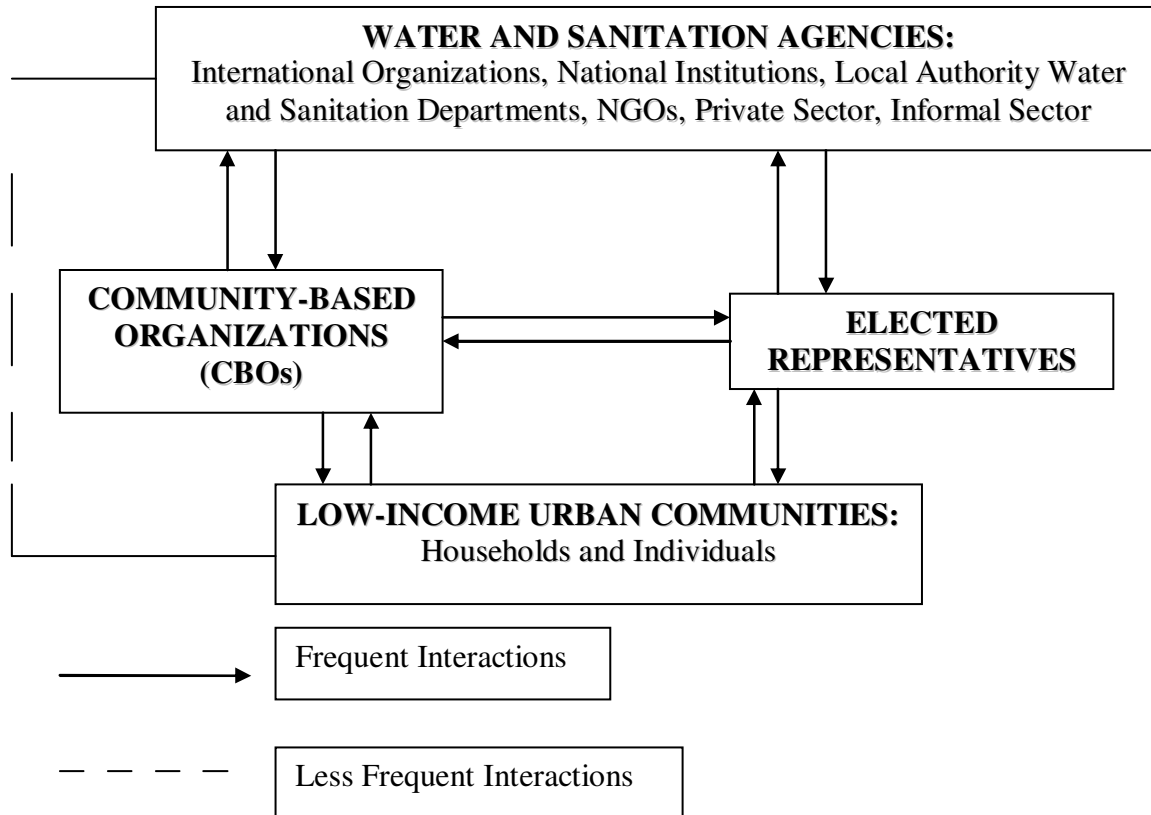


Figure 1. Relationship between different actors in the water and sanitation sector.
Source: Based on Mulenga et al. (2004).

The survey was descriptive and cross-sectional involving questionnaires, focus group discussions and the use of structured checklists. A total of 360 households, made up of 90 households from each of the four communities, were randomly selected for the questionnaire survey. The issues covered in the household survey included access to water supply and sanitation, cost of service and perceptions of community-based water and sanitation providers. In addition to this, 45 community-based water providers and toilet operators, drawn from the various study communities, were interviewed through the use of structured checklists. Issues covered under this category comprised a mixture of examples of innovative practices provided by community-based water and sanitation providers, their bottlenecks and their importance to local community members. Although some information from companies has been drawn from published materials, much was gathered from field surveys. Service providers were randomly selected for interview using information obtained from water vendors and toilet operators associations in the study communities.

RESULTS AND DISCUSSION

Major actors in the urban water and sanitation sector in Ghana

It has been recognized for a long time that for water supply and sanitation services to be effective and sustainable they have to meet the needs, which the

urban poor themselves perceive (Wright, 1997). For this to be possible, communities should be able to demand the type of services, which suit their needs. An effective system of communication between water and sanitation agencies and communities at all stages of the project cycle is therefore inevitable. Four significant partners were identified in relation to the provision of services and facilities in low-income urban settlements (Figure 1). These are:

1. The agencies involved in service provision, including international, national and local government departments, non-governmental organizations (NGOs), private enterprises (both large and small, national and local) and the informal sector (e.g. water vendors);
2. Representatives, who are elected by local community members to represent their interests;
3. Organizations formed within and by the local communities themselves – community-based organizations (CBOs); and,
4. The poor households and individuals themselves.

The diagram in Figure 1 illustrates the links between the four major actors in the water and sanitation sector indicating the potential importance of CBOs and elected

local representatives in facilitating or impeding communication between agencies and communities. Whilst there can be direct links between agencies and households and individuals, these interactions are often weak and less formal/frequent than if they are conducted through CBOs and/or representatives. This is especially so because many agencies lack the skills and resources to enable them undertake community programmes which allow for the participation of the local people. On the other hand, CBOs and local representatives are more aware of the problems of their communities and are in a better position to represent them favorably.

Nature and significance of community-based water and sanitation systems in urban Ghana

The prevailing systems of urban water and sanitation provision in Ghana divides communities into neat groups between those who can pay for services and those who cannot and this has frequently guided investment decisions by both public and private service providers. This has also given rise to parallel sectors - the formal water and sanitation sector with piped/sewerage municipal supply and the informal sector serviced mainly by water vendors and private toilet operators. Most community-based water and sanitation systems in low-income urban Ghana fall under the informal sector. Access to water supply and toilet differ between the communities covered in the study (Table 2). The table shows that the majority of households depend on community-based water vendors and public toilet facilities for their water and sanitation needs. In general, where public toilet facilities are lacking, residents resort to the use of the bush/beach.

There is a whole range of different types of water and sanitation providers in the informal sector in the communities studied ranging from households sharing a private house facility to large-scale water tanker suppliers (Table 3). The facility available in each community, however, depends on its peculiar circumstances. These kinds of service providers are rarely included in the planning for privatization and public-private partnerships (PPPs) by either national or local authorities. Yet, it is especially these forms of partnerships which include civil society as a partner and which can be most responsive to the demands and needs of the civil society, one likely to ensure a level of equity of access that may be lacking with the formal service providers (Kalyan and Kakebeke, 1995; Silva et al., 1998). The experience in the study communities reveals that women often play a key role in managing local water and sanitation facilities, but mostly at the household level.

Security of tenure is a key factor that justifies the existence of informal service providers in low-income urban settlements, and hence its relevance to poor urban households. The willingness to invest in a new and improved service depends directly on the security of

tenure of the household. A household which is unsure of its tenure will continue to pay to water vendors and toilet operators to meet its daily needs. Most low-income urban settlements in Ghana, such as Old Fadama, are unofficial and so, without legal tenure, the people living in them are not entitled to connections to basic facilities like water and sanitation. These settlements are also vulnerable to demolition as governments reclaim the land for other uses. It is therefore not surprising that there are no public facilities in Old Fadama. Again, in dense, overcrowded urban conditions, as exists in Sukura and Lamashegu, it is often difficult for households to find space to build latrines. Many defecate in the open or share whatever limited facilities are available which tend to offer no privacy, safety or hygiene. Women, in particular, reported being prisoners of daylight as they feel uncomfortable going to the toilet in the open during the day.

One of the most important planning decisions that a household considers before acquiring a piped connection or constructing a toilet facility concerns the level of service. The new facility should provide a level of service better than the available options. Vended water and communal pay-and-use toilets are usually quite reliable and a higher level of reliability is needed to wean away customers, if they are operational in the area. A piped system that is not reliable enough, as is the case in Ghana, not only fails to attract customers but often result in large unpaid bills due to a distrust which is difficult to remove. Price (including connection fee) is an important determinant of a household's decision to connect to a municipal system by moving away from other sources. On the supply side, water pricing has been based on such established methods as marginal cost pricing or cost recovery (Solo, 1998). Prices determined by such methods however fail to capture the ability or the willingness of a household to pay for the services (Osumanu, 2007a). A mismatch between the two often results in high-quality piped water systems bypassing large low-income settlements towards higher income destinations.

The distribution of water by vendors is expensive, irrespective of whether transmission is powered by people, animals or engines. In addition, it is generally the case that households served by private operators pay higher charges for water and sanitation than those directly connected to a piped network or a municipal sewerage system. Beyond cost considerations, vended water and communal toilets have been linked to health problems (Benneh et al., 1993; Osumanu, 2007b). Positive features of these activities are that they provide a valuable service for communities in urban areas with no access to piped water or private toilets. They also offer a significant saving of time compared to fetching water or defecating from other sources. Other positive features of informal water and sanitation providers concern their labour-intensiveness and thus job creation impact and the fact that the simple technologies of water and

Table 2. Households' access to water supply and sanitation in the study communities.

Community	Major source of water supply (%)						
	Piped in dwelling	Piped outdoor	Borehole	Well	Rain water	River/lake/pond	Vendor
Old Fadama	13.6	0	0	0	0.2	0	86.2
Sukura	32.5	0	1.9	1.1	0.2	0	64.3
New Takoradi	4.7	0	0	3.6	0.1	0	91.6
Lamashegu	24.1	41.0	2.0	1.6	0	0.7	31.3

Community	Main type of toilet facility (%)				
	Flush toilet	Pit latrine	VIP/KVIP latrine	Pan/bucket latrine	Bush/beach
Old Fadama	0	7.0	48.7	32.2	10.1
Sukura	6.1	34.5	56.8	12.6	0
New Takoradi	4.2	18.3	22.3	1.5	54.7
Lamashegu	4.5	28.2	26.3	10.3	30.7

Table 3. Types of community-based water and sanitation systems in urban Ghana

Type of facility	Description
Group facilities	These are closest to private connections and exist in all the communities except Old Fadama. They are common in areas where multiple households usually occupy a single compound house. Under this system, households jointly take one private piped connection or toilet facility and share the bill. Essential social conditions for the success of this system are that the users form their own group and decide in whose name the connection is registered (in most cases the landlord), where the tap or toilet is located and how costs are shared.
Communal facilities	These comprise communal standpipes and public toilets that were formally managed by public utilities but have now been franchised to communities. Here water is sold per bucket at public vending points and toilet facilities are provided on pay-and-use basis. The community chooses a small (usually three persons) committee, which manages the overall fund and takes care of maintenance and repairs of the water or sanitation system. These types of facilities are found in New Takoradi and Lamashegu.
Individual water vendors and toilet operators.	These facilities exist in all the study communities except Lamashegu. In this category are the various individual water sellers who store water in polythene tanks or concrete erected ponds and sell water to their customers through the bucket system. Included in this category also are private toilet operators who make their private toilets available for other people to use for a fee. In Sukura, there are also entrepreneurs who acquire plots of land purposely for constructing toilets as a commercial venture.
Mobile water vendors	These range from water vendors who use trucks or donkey carts (as in Lamashegu) to transport water to their customers, to large scale water tanker suppliers who service a whole range of customers including households in wealthy neighborhoods and even private water vendors (as in Old Fadama and Sukura).

sanitation systems they employ can be readily maintained on a local basis.

Opportunities and constraints to community participation in public water and sanitation services

There are many opportunities for community participation to improve the quality and profitability of water and sanitation sector operations in Ghana. Experiences worldwide have shown that most community participation in urban environmental resources management is based on action-oriented activities and education (Fujikura,

2000). The involvement of users and communities early on in the process of development of a water supply or sanitation project is critical in order to ensure the sustainability of these services. This, however, is not the usual norm in Ghana where service providers operate with a top-down approach deciding on such crucial issues as service levels for the user communities who are brought into the picture only after the services are provided. For effective partnership in the provision of water and sanitation services, planners and engineers must relinquish some of the responsibilities and privileges which they typically assume for shaping and designing urban infrastructure policy and strategies.

Table 4. Primary responsibility for community-state-private partnership.

Stage/Activity	Consultancy	Management	Lease	Concession
Planning	State-Private-community	State-Community	State	Community
Building/Rehabilitation	State-Private- community	State-Community	Private	Community-Private
Operation /Maintenance	State-Private	Community	Community	Community
Monitoring/ Evaluation	State-Private	State-Community	Private	State-Community

Additionally, public agencies will have to hire private consulting firms to provide them with the required participatory planning services (Whittington et al., 1998).

In general terms, where responsibility for each stage lie under various forms of community-government-private sector partnership alternatives are presented in Table 4. Water and sanitation utility activities can broadly be categorized according to the principal stages of the project cycle into (i) planning - for developing new plant installations, or extending service provision to new areas, (ii) building/rehabilitation - undertaking engineering works on the ground (ranges from highly technical work, such as refurbishing treatment works, to unskilled, labour intensive tasks, such as laying small diameter local network pipes, meters and tanks), (iii) operation and maintenance - system and customer management including meter reading, revenue collection, leak detection and repair and (iv) monitoring and evaluation - checking water quality, security of supply, checking against targets and standards (Batcher and Scott, 2001).

The information presented in Table 4 is based on the experiences and the bottlenecks identified in community water and sanitation initiatives in the study communities. The principles applied to developing the content of the partnership matrix focuses primarily on project sustainability with emphasis on economic and institutional abilities of both formal institutions and local communities. Where it is indicated that responsibility rests with the state, specific tasks and services may well be delegated to community-based organizations or private consulting firms, but overall responsibility remains with state administration. The matrix table shows that operation and maintenance and, to a lesser extent, concession are the areas in which the community is most likely to be the dominant actor. Each stage of community-state-private sector partnership offer benefits, although the potential is greater in certain stages. Community involvement in infrastructure planning can help minimize risk. Operating risk in low-income communities tends to be high, and is exaggerated by limited understanding of local culture, attitudes, markets and business practice. Open and transparent processes can defuse hostility and allay suspicions, fears and prejudices. As the emphasis within infrastructure planning shifts from supply side to demand side, an understanding of consumer behaviour is becoming more important (Batcher and Scott, 2001). In particular, an accurate assessment of willingness to pay

can be important in guaranteeing security of investment (Whittington et al., 1992). Within the planning stage, participation may be restricted to information exchange - helping planners to understand community needs and assess local knowledge, and for communities to understand plans and options and associated benefits. This facilitates understanding and co-operation among all parties.

Community participation in concession for construction and rehabilitation facilitates understanding, ownership and innovative design. Community involvement is important in the selection of technology so that the design that has been adopted is what the community wants, is prepared to pay for and is able to maintain. At the periphery of a water or sanitation system construction, the skills needed to design, install and maintain systems are commensurate with artisan skills available in low-income areas. In this case meaningful community control of systems becomes feasible. Communities can also become involved in design of systems (decision making), capacity building (gaining skills to install and maintain systems), and providing labour. Delegation of tasks to communities can reduce operating costs. Communities are best placed to monitor progress and quality of work, and could take responsibility for monitoring of community-based contractors. Community members have a vested interest in ensuring that work is carried out properly, possibly leading to good quality control and less risk of disputes with service providers. Although community participation in water and sanitation operations can offer a win-win scenario, that is not to say it is easy to achieve, there are several constraints but lack of effective communication is perhaps the most important one. Successful communication with communities is possible when the service provider is prepared to involve the community in the programme process. It is often found that public authorities and formal service providers do not have the ability or willingness to directly communicate with user communities; instead they depend on a mediator, often a non-governmental organization or personnel from a government department/agency. This often leads to a breakdown of communication between the service provider and the user community. One of the major obstacles to community participation in water and sanitation provision is the lack of ready access of communities to institutional finance. Additionally, community labour is generally unskilled and will have little

experience of installing water and sanitation systems. Without adequate training factored into the overall costs, use of local labour can be disappointing. By its very nature, local labour agreements are temporary. People's long term priorities will, therefore, remain with their established income generating activities, with the result that local labour may be unreliable.

According to Arapto and Adisenu (2006), reluctance of communities to effectively participate in water and sanitation services in Ghana is as a result of the perception that it is the responsibility of government to provide water and sanitation facilities for the people and the reading of politics into development projects. Most communities perceive the services provided by non-governmental organizations as being offered by the government and under no circumstances should they offer free services to the government. Besides, when somebody at an opposing political divide is leading a project, others on the other side of the divide fails to participate for fear that their opponent might score political points.

Conclusion

Improvements in urban water supply and sanitation provision is central to the achievement of the Millennium Development Goals (MDGs) and requires a multi-sectoral approach. Unfortunately, community initiatives in interventions to improve service delivery have not been given attention at both national and local government levels. The most common water and sanitation facilities servicing households are community-based systems including group and communal facilities as well as private-profit motive water and toilet operators. The type of facility available in a community is a function of its peculiar circumstances with security of tenure, reliability of service and cost of service justifying the existence and relevance of community-based service provision in low-income urban areas. The study and other evidences provided in this paper reveal that communities can collaborate both public and private service providers to solve urban water and sanitation problems in Ghana. The experiences from the four communities studied suggests that planning, operation, maintenance and monitoring and evaluation of facilities are the areas in which community involvement is likely to reap benefits in community-state-private sector partnerships in urban water and sanitation provision in Ghana. The study particularly recognizes the potential importance of CBOs, elected local representatives and women in facilitating community involvement in urban water and sanitation provision in Ghana. Admittedly, involving communities in partnerships brings along with it numerous challenges including lack of effective communication and technical ability by community members.

The paper has demonstrated that a vibrant water

supply and sanitation systems comprising a range of service providers who meet the demand of the urban poor should be encouraged. This could be done through the creation of partnerships between community-based water and sanitation providers and state-owned and private utility operators. In addition to contributing to service provision, communities can also be important partners in improving the efficiency in the sector. Informed and motivated community groups can help reduce wastage of water and the large unaccounted-for losses from public distribution systems. Firstly, the active involvement of the community in what has traditionally been a public sector responsibility requires a more flexible approach, and legal and regulatory frameworks need to change to reflect this. Secondly, mainstreaming community initiatives and realizing their potential to act in full partnership with the state and utilities will require sustained effort, among others, in the following areas:

1. Information sharing: As a starting point for community involvement and participation information helps communities to understand issues and bring their commitment to the partnership process.

2. Consultations: Regular consultations with communities to assess their effective demand (affordability and willingness to pay) for the services helps service providers to understand community preferences and to move away from top-down planning to participatory planning approaches.

3. Capacity building: Building capacities through education and technical assistance to enable communities play their roles in the process of partnership.

4. Participation: Enabling communities to participate in the decision-making process will call for necessary institutional and legislative reforms, such as providing better access to communities to funding sources and security of tenure, and preparedness on the part of the government and service providers to involve communities in vital areas of technical and financial decision-making.

Finally, finding solutions in urban areas can be complex. Communities tend to be less cohesive than in rural areas and this can make community-based development programmes difficult to implement. The focus should be on forming, or finding existing, community groups to take projects forward.

REFERENCES

- Arapto P, Adisenu E (2006). Challenges of community participation in an integrated WATSAN project in a peri-urban set up: The case of Old Ningo. PRONET-Ghana, Accra.
- Batcher S, Scott N (2001). Community participation in urban water: A

- report demonstrating the benefits of private sector engagement with local communities when providing urban water services in developing countries, Gamos Ltd., Andy Atkins.
- Benneh G, Songsore, J, Nabila JS, Amuzu AT, Tutu KA, Yangyuoru Y, McGranahan G (1993). Environmental problems and the urban households in the Greater Accra Metropolitan Area (GAMA) – Ghana, Stockholm Environment Institute, Stockholm.
- Franceys R (1997). Private sector participation in the water and sanitation sector. Private waters? – A bias toward the poor, DFID Occasional Paper No. 3, WEDC, IHE.
- Fujikura R (2000). Public participation in urban environmental management in Japan. In: Yusuf Wu SW, Evenett S (eds.) *Local Dynamics in an Era of Globalization*, The World Bank, Washington DC., USA, pp. 169-174.
- Ghana, Republic of (1993). National Water and Sanitation Policy, Ministry of Local Government and Rural Development, Accra.
- Ghana Statistical Service (2008). Ghana Living Standards Survey: Report of the Fifth Round (GLSS 5), Ghana Statistical Service, Accra.
- Kalyan R, Kakebeeke JW (1995). Community participation in urban water and sanitation: The missing link in public-private partnership, Environmental Health Project, USAID, New York.
- McGranahan G, Jacobi P, Songsore, J, Surjadi C, Kjellen M (2001). *The citizens at risk: from urban sanitation to sustainable cities*, Earthscan, London.
- Mensah K (1999). *Water law, water rights and water supply (Africa): Ghana Study Country Report*, DFID, Accra.
- Mulenga M, Manase G, Fawcett B (2004). *Building links for improved sanitation in poor urban settlements: recommendations from research in Southern Africa*, Institute of Irrigation and Development Studies, University of Southampton, Southampton, England.
- Osumanu IK (2007a). Environmental concerns of poor households in low-income cities: The case of the Tamale Metropolis, Ghana. *GeoJournal*, 68: 343-355.
- Osumanu IK (2007b). Household environmental and behavioural determinants of childhood diarrhoea in the Tamale Metropolitan Area (TMA), Ghana. *Danish J. Geogr.*, 107(1): 59-68.
- Silva G, Tynan N, Yilmaz Y (1998). Private participation in the water and sewerage sector – recent trends. Public Policy for the Private Sector, Note No. 147, The World Bank Group, Washington DC, USA.
- Solo TM (1998). Competition in water and sanitation: The role of small-scale entrepreneurs. Public Policy for the Private Sector, Note No. 165, The World Bank Group, Washington DC, USA.
- United Nations Development Programme (UNDP) (2006). *Human Development Report 2006: Beyond scarcity: power, poverty and the global water and sanitation crisis*, UNDP, New York.
- Whittington D, Lauria D, Wright A, Choe K, Hughes J, Swarna V (1992). *Households demand for improved sanitation services: A case study of Kumasi, Ghana*, UNDP-World Bank Water and Sanitation Programme, Washington DC., USA.
- Whittington D, Davies J, McClelland E (1998). Implementing a demand-driven approach to community water supply planning: A case-study of Lugazi, Uganda. *Water Int.*, 23(3). IWRA, USA.
- Wright A (1997). *Towards a strategic sanitation approach: Improving the sustainability of urban sanitation in developing countries*, UNDP-World Bank Water and sanitation Programme, Washington DC., USA.