
A Learning Platform to address Urban Water Management in the City of Accra. An assessment of the SWITCH project in Accra 2010

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I. CITY CONTEXT, THE SCOPE AND FOCUS OF SWITCH SCIENCE AND ACTIVITIES IN THE CITY

Introduction to the city of Accra

Within the West-African region, Ghana is one of the strongest growing economies. Its population of about 23 million people generate a per capita GDP of US\$ 2,700. In 2008, an estimated 82% of the population had access to improved water supply, whilst only 13% of the population had access to improved sanitation facilities (WHO/UNICEF, 2010). Accra is the administrative, political and commercial capital of Ghana and is the most populated and the fast growing metropolis in Ghana.

Originally, the “City of Accra” covered only the area under the Accra Metropolitan Assembly (AMA). However, in the last two decades, the city has sprawled beyond these boundaries and currently also covers parts of Ga West, Ga South, Ga East, Tema Metropolitan Area (TMA), Ledzekuku-Krowor, Ashaiman and Adenda. This area is often referred to as **Greater Accra Metropolitan Area (GAMA)** and is part of the Greater Accra Region, one of the 10 administrative regions of Ghana. Figure 1 shows the Greater Accra Region, the Greater Accra Metropolitan Area (GAMA) and districts which together make up GAMA.

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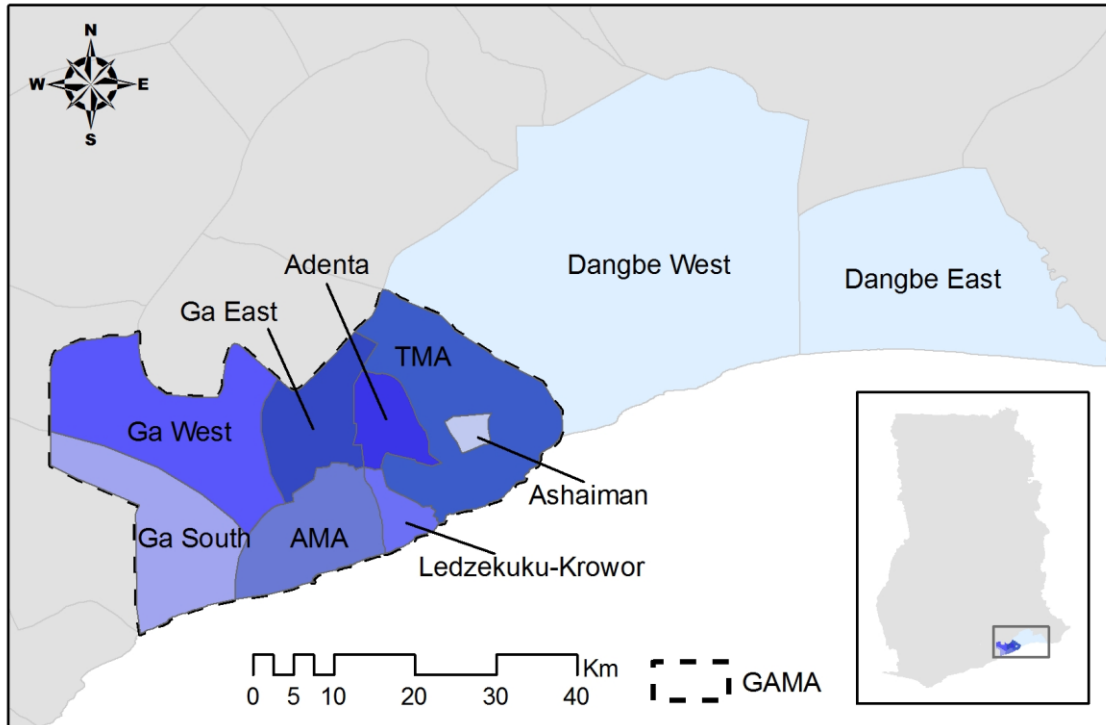


Figure 1 Districts in the Greater Accra Metropolitan Area (GAMA)

Source: Adapted from Adank et al (2011).

The Greater Accra Metropolitan Area covers about 1261 km² (Twum-Baah, 2002) and had a population of about 2.7 million in 2000 (GSS, 2002). Annual 1984-2000 population growth rates varied from 3.4 per cent in AMA and Ledzekuku-Krowor, to 6.4 per cent and 9.2 per cent in the Ga districts (Ga East, West and South) and Tema districts (TMA, Ashaiman, Adenta) respectively, while the average growth rate of the Greater Accra Region amounted to 4.4 per cent. Based on different growth scenarios, Adank et al (2011) estimate that the 2007 population of Accra was between 3.4 million and 3.9 million people. By 2030, the Accra population would reach 7.5 million in a low growth scenario (of 3.4 per cent per year), while the population could explode to more than 16 million inhabitants in a high growth scenario (applying the district specific growth rates mentioned above).

The majority of the Accra population, some 54 per cent, live in compound housing (GSS, 2008). The informal trading and service industries is an important source of employment for many citizens of Accra.

Urban Water Management in Accra

The main source of drinking water supply for the city of Accra is the utility system

managed by the Ghana Water Company Ltd (GWCL), supplied from the Weiija and Kpong dam. The capacity of the utility system was 424,134 m³/day in 2007, while average production was 363,417 m³/day (86 per cent of capacity). This would give 93 litres per capita per day (lpcd) assuming a high population growth scenario⁶, or 106 lpcd, assuming low growth. This is lower than the estimated average optimal water demand of 130 lpcd, which includes physical losses and commercial and industrial water use. In addition to a supply that does not meet the optimal demand, the utility system struggles with a high amount of non-revenue water. Based on 2007 data, 59 per cent of the water produced is not sold, because of physical losses (pipe bursts, etc.), as well as commercial losses (non-payment of bills, inaccurate meter reading etc.). Water supply from GWCL is irregular and unreliable in a big part of GAMA. The figure below gives an overview of the water supply situation in Accra in 2007.

As shown in Figure 2, just under half of the Accra population do not receive water directly from the utility system through GWCL household connections, but rely on more expensive intermediate service providers, like water vendors and water tankers. Only about 28% of the poor have a direct connection to the utility system and low income households use less water than high income households. However, they tend to pay more per unit of water than people connected to the utility system. A small part of the population in the peri-urban outskirts of Accra relies on a community system facilitated by the Community Water and Sanitation Agency (CWSA) or private managed systems, independent of the utility system, but paying more per unit water.

⁶ as defined by Adank et al (2011), based on GSS (2002) data, as mentioned in section 1

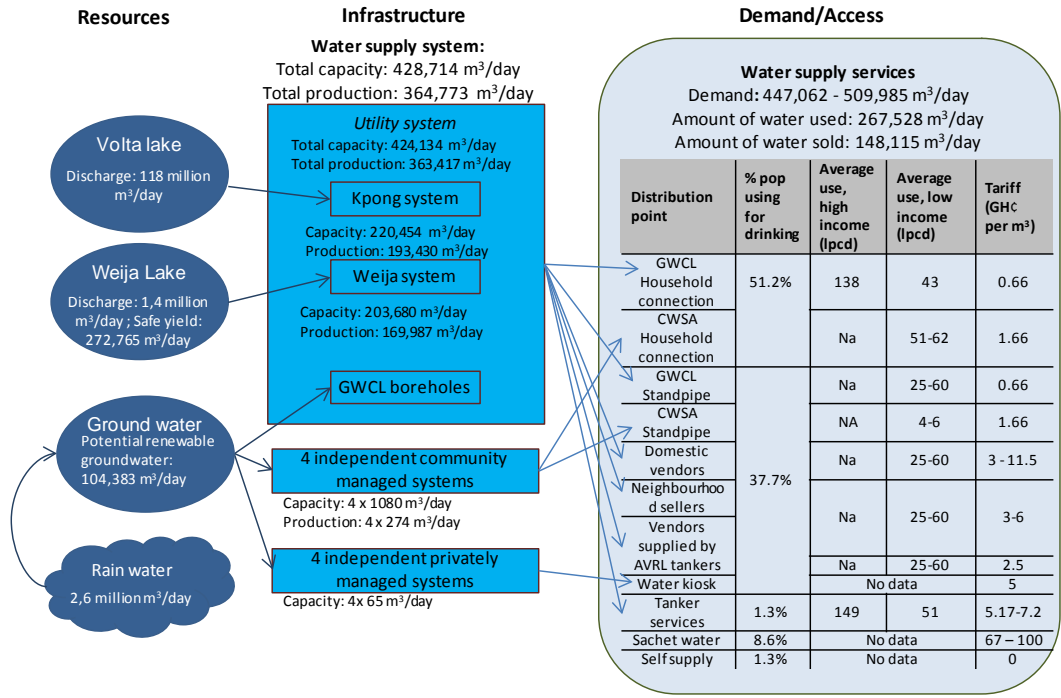


Figure 2 Overview of the 2007 water supply situation in the Greater Accra Metropolitan Area (GAMA)

Source: Adapted from Adank et al (2011).

The situation related to excreta and wastewater management in Accra is very poor, as illustrated in Figure 3. A large part of the population (41 per cent), especially low income households residing in densely populated areas, depends on public latrines, which are often poorly managed and more expensive than private facilities. In addition, there are still people in Accra, who practise open defecation or use unhygienic bucket or pan latrines (4.3 per cent of the population, according to GSS, 2008). There is a lack of treatment capacity to deal with the amount of faecal sludge and wastewater generated and most existing excreta collection and treatment facilities are non-functional. A large volume of wastewater is evacuated from the city towards the sea through the stormwater drainage system, mainly consisting of a number of streams and rivers, the main one being the Odaw River which drains into Korle Lagoon which in turn drains into the sea. These drains have become heavily polluted. A lot of solid waste is also discarded into these drains, which leads to blockages and contributes to flooding at times of heavy rain.

Accra faces serious flooding problems during the rainy season, which causes damage to life and property. The situation is especially bad in the low-lying, flood-prone areas, where many of the urban poor live in unplanned and often informal settlements. Natural features such as geology, soil conditions and topography contribute to the occurrence of floods to some extent, but the majority of the flooding problems are created by the inadequate stormwater drainage system, in

combination with the growing urbanisation of the metropolis and the resultant impact of decreased infiltration and increased surface water run-off (AMA, 2006).

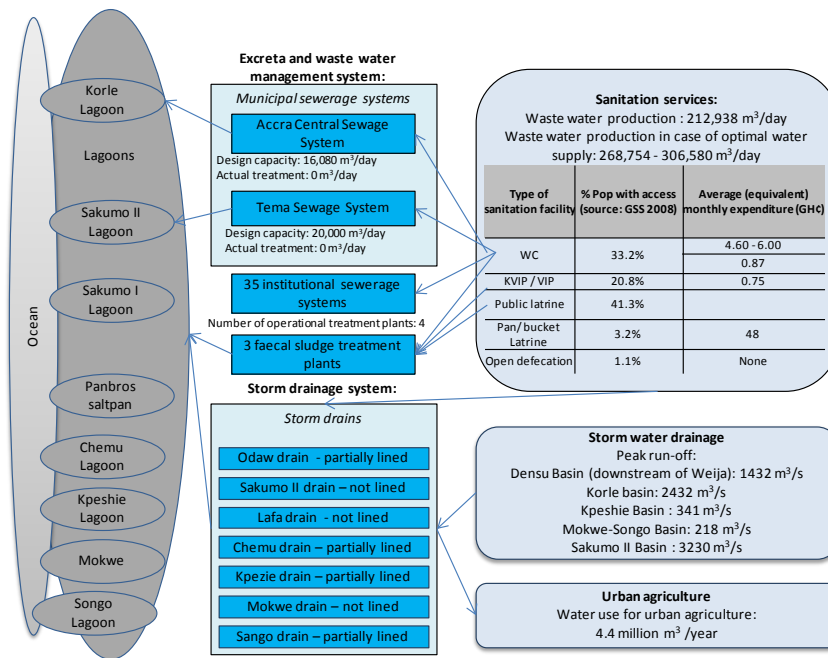


Figure 3 Overview of the 2007 waste and stormwater management situation in the Greater Accra Metropolitan Area (GAMA)

Source: Adapted from Adank et al (2011).

Some of the stormwater is captured and used for urban agriculture, as practised in a major part of the green area of the Greater Accra Metropolitan Area, which produces a large part of the city's fresh food and vegetables. This gives aesthetic value to the city, contributes to groundwater recharge and decreases stormwater run-off. According to Obuobie et al (2006), about 800-1,000 farmers earn an income through urban agriculture. Abraham et al. (2007) estimate that about 680 ha is cultivated with maize, 47 ha with vegetables and 251 ha with mixed cereal-vegetable systems. In addition, there are an estimated 80,000 tiny backyards covering a total area of about 50-70 ha. Cultivated plots in the city range from 0.01-0.02 ha per farmer and increase to 2.0 ha in peri-urban areas. Practically any open space is used for farming vegetables or other crops because of the high demand from the city.

Water Governance

Water governance in Accra is fragmented, with overlapping areas of responsibility. There is poor-to-no enforcement of existing planning regulations and a lack of frameworks for integrated planning. It is complex due to the large number of administrative institutions and the fact that Accra is the national, regional and

municipal capital resulting in it being home to many different administrative departments. The Greater Accra Metropolitan Area is divided into eight **Metropolitan and Municipal Assemblies (MMAs)**, the highest political authorities mandated to govern at the respective municipality or metropolitan area level and responsible for the provision of basic infrastructure and public services. The area under the assemblies is administratively sub-divided into 'sub-metros', which are in turn further divided into area councils and unit committees. In rural areas District Assemblies play this role and all these bodies together are referred to as MMDAs.

The **Ministry of Water Resources, Works and Housing (MWRWH)** is responsible for setting the water policies for the country. The **Ministry of Local Government and Rural Development (MLGRD)** is responsible for the policies and programmes for the efficient administration of local government structures. The **Ministry of Finance and Economic Planning (MOFEP)** provides the finance to support the delivery of urban water and wastewater infrastructure as well as the operational and capital expenditure budgets of the sector institutions. Most development assistance from donors is channelled through the ministry. The sector relies substantially on donor funds.

Service providers

Formal responsibility for urban water supply lies with the utility company **Ghana Water Company Limited (GWCL)**, which reports to the Ministry of Water Resources, Works and Housing. GWCL has since 1999 been operating as a limited liability company. As part of urban water sector reforms, GWCL entered in 2006 into a five-year management contract with Aqua Vitens Rand Limited (AVRL), a Dutch-South African joint venture, for the operation of the urban water system. GWCL is responsible for its customers, rather than for the local population. Until one is connected to the formal utility, one is not considered a customer even though one consumes water. People not connected to the utility system; depend on a variety of intermediate private service providers and in some cases on community (Water and Sanitation Development Boards) or privately managed independent service providers.

Responsibility for implementing projects and programmes in excreta and wastewater management lies with Metropolitan, Municipal and District Assemblies (MMDAs), through their waste management departments. These are expected to promote the construction and use of domestic and institutional latrines, treatment and disposal of waste, law enforcement and improved management of urban sewerage systems. In AMA, a separate sewerage unit has been set up, which is responsible for the implementation of the Accra Sewer Improvement Project (ASIP) and the operation and maintenance of the sewer infrastructure in Accra. A challenge for the MMDAs is the capacity in terms of resources and personnel to effectively provide sanitation services.

The responsibility for primary drains lies with the **Hydrological Services Department** of the MWRWH. The responsibility for constructing secondary and tertiary drains lies with the Department of Urban Roads of the Ministry of Roads and Transport, as drains are usually installed as part of road construction. This activity falls under the **Urban Roads Department** (Metro Roads Department) under the MMAs. They also have a secondary responsibility of maintaining the drains. The Metropolitan and Municipal Assemblies within GAMA are responsible for maintaining tertiary drains, in this case mainly cleaning and de-silting them.

Regulatory agencies

The **Public Utilities Regulatory Commission (PURC)** is responsible for the economic and drinking water quality regulation for GWCL water supply services. It is an independent body and is not subjected to direction or control of any authority in the performance of its functions. Even though the PURC is aware of the existence of secondary and tertiary providers, these are neither formally recognised nor regulated. In areas not supplied by systems under community management, **Water and Sanitation Development Boards**, set their own tariffs, which are then approved by the respective district or municipal assembly.

The regulation of wastewater discharge is the responsibility of the **Environmental Protection Agency (EPA)** which was established by Act 490, 1994. The duties of the EPA include ensuring wastewater disposal is in accordance with LI 1652 - Environmental assessment regulations of 1999.

The **Water Resources Commission (WRC)**, established under Act 522, 1997, is responsible for the regulation and management of the use of water resources and for the co-ordination of any policy related to its functions.

The SWITCH project

As presented above, the city of Accra, like many cities in sub-Saharan Africa and Asia, struggles with managing water and with providing its growing number of citizens, especially the poor, with access to proper and affordable water supply and sanitation services. As such, Accra was selected as one of the focus cities for the SWITCH project.

The guiding objective behind the SWITCH concept was one of challenging the “status quo” or business-as-usual approach to Integrated Urban Water Management (IUWM). The SWITCH concept was to deliver a “demand led” urban water management research programme whereby interaction between the city stakeholders and the researchers would take place through a platform known as a learning alliance.

This report

In order to assess how the SWITCH approach has contributed towards the future vision of Accra, a review of the work carried out in Accra under the SWITCH Project has been undertaken. This assessment was carried out as process documentation, through the review of available project documentation, such as progress reports, workshop reports, city stories, research reports, etc., review of research and demonstrations, and informal semi-structured meetings/interviews with stakeholders and members of the SWITCH Project Team, using a set of open questions.

A description of the history of the project, the intervention logic and activities undertaken under the SWITCH project in Accra, are presented in detail in the next section. The major findings of the assessment are described in section 3, describing the major changes that have taken place, to which SWITCH has contributed. Finally, chapter 4 presents the main conclusions.

II. THE SWITCH APPROACH IN ACCRA

This section describes the way that the SWITCH project was approached in Accra. It outlines the project's origins, the efforts made to link this to the urban water situation described above, and the initial steps in establishing the project. Information is provided on the project team, partners and stakeholders. This is followed by a description of the intervention logic of the project, i.e. the way in which the different activities aim to achieve the overall objectives. Finally, an overview of the main activities is given.

SWITCH Accra start up

In June 2006, an inception visit team, consisting of SWITCH consortium members KNUST, IWMI, IRC and NRI representatives and the SWITCH Project Manager, visited a large number of organisations involved in water management in Accra. A range of problems associated with Integrated Urban Water Management were identified, including:

- Technical matters (e.g. water leakage, malfunctioning treatment plants, solid waste in drains).
- Lack of access to safe water and sanitation - especially in poor areas.
- Up-stream/downstream issues, including pollution of water bodies due to inadequate treatment/control and poor sanitation and the use of polluted wastewater in urban agriculture.

- Organisational and staff capacity.
- Financial constraints.
- A multitude of institutional issues (including poor enforcement of bylaws, weak inter- and intra-organisational linkages, Improper land use planning and regulatory control in Urban Water Management, lack of political will to effect 'polluter pays' etc.) (Morris et al, 2006).

The learning alliance approach was considered an appropriate way to address institutional issues, especially related to the weak inter- and intra-organisational linkages, and to facilitate the uptake of research findings and scaling up of demonstrations. A range of potentially relevant SWITCH Work Packages was identified including WP 2, stormwater management; WP 3.1, demand management; WP 3.2, safe re-use of urban water; WP 4.1, ecosanitation and decentralised wastewater management; WP5.2, water use in urban agriculture; WP 5.3, use of natural systems for wastewater treatment; and WP 6, governance and institutional change. However, through the design of the project, resources had initially been allocated mainly to research on water use in urban agriculture (WP5.2) and use of natural systems for wastewater treatment (WP5.3).

It was generally agreed that matching the priority needs of the city stakeholders to SWITCH's research resources was a key opportunity, albeit one that the design stage of the project had not adequately accommodated. (Morris et al, 2006). However, there was an obligation to establish aspects of Urban Water Management that would be addressed in each of the Cities in order that these were rationalised across the whole programme. As a result a number of the Accra specific problems that were identified above did not become included in the Work Packages.

Sufficient resources were freed up to enable the learning alliance process to take off. A learning alliance Facilitator was recruited and the Accra Learning Alliance was formally launched at the First Accra Stakeholders' Forum, held on 14-15 March, 2007 at Novotel Hotel in Accra. This workshop brought together key stakeholders in urban water management, such as policy makers, regulatory agencies, researchers, consumer groups and representatives from local assemblies – including the Mayor of Accra and the then Minister of Water Resources Works and Housing. During the meeting, stakeholders formulated a common vision for the City of Accra and identified key issues in IUWM that they felt needed to be addressed. The box below presents the vision for Accra, as defined by Learning Alliance members.

Box 1 The vision for Accra in 2030, as defined by the Accra Learning Alliance

In 2030, everyone in the city of Accra (the Greater Accra Metropolitan Area), regardless of economic and social status, will have access to uninterrupted water supply, at an affordable price within a reasonable distance from the house. The water quality of the supplied water will meet Ghana Standard Board criteria. Non-revenue water in the GWCL system, caused by physical and commercial losses, will have decreased to 25 per cent.

In 2030, at least 80 per cent of Accra's citizens have access to an acceptable level of sanitation facilities, including flush toilets, KVIPs or good public toilets. Pan and bucket latrines will be phased out. Good sanitation behaviours will be practised by at least 80 per cent of Accra's citizens. There will be no more open defecation and littering, and hand washing after toilet use will be common practice. People will willingly pay for waste management. This will have led to a 70 per cent reduction in water and sanitation diseases.

In 2030, Accra will be a cleaner city with a well-functioning drainage system. There will be integrated solid waste management (collection, transport, treatment and final disposal) of solid waste in a sustainable way. At least 90 per cent of the solid waste will be collected. The improved collection of solid waste will have eradicated the dumping of solid waste into small and larger drains. The drains will be free from solid waste and pollution of the surface waters and the risk of flooding will have reduced. There will be improved productive uses of water for livelihood (micro enterprises and agriculture), especially through the reuse of stormwater and/or wastewater in urban agriculture.

Project team and partners

During the scoping visit in 2006, it was agreed that there would be a need for a city coordinator, as well as a learning alliance facilitator in order to ensure coordination of SWITCH activities and to facilitate the learning alliance process in Accra. Initially the role of city coordinator was taken up by Dr Olefunke Cofie from IWMI, based in Accra. However, by the end of 2006, in the absence of a budget for her time and other resources, it was decided she would hand over this task to Prof Esi Awuah, from KNUST, based in Kumasi.

By the end of 2006, Bertha Darteh was appointed as learning alliance facilitator on a half-time basis and received training in topics such as the development and facilitation of learning alliances, process documentation and monitoring of the LA process. Two learning and sharing workshops were organised for all facilitators to create a platform where they could share their experiences.

In the event, the facilitator needed an assistant because of the time consuming nature of her job. One illustration is that for every workshop the facilitator had to visit all the people invited, as in Ghana people tend to only come to workshops when invited personally. This is a time consuming task as only two or three people

can be visited daily. Bertha Darteh also started work on a PhD on the topic of learning alliances and had to spend some time away from Ghana. Up to the end of July 2009, the facilitator was supported by an assistant facilitator, David Assan, and later by Henrietta Osei-Tutu who joined the project team after his departure.

The International Water Management Institute (IWMI) hosted the learning alliance facilitator from 2007 until the end of 2008, after which she relocated to the newly established “Accra WASH House”, shared by a number of WASH organisation and projects, including the IRC International Water and Sanitation Centre. The LA facilitator was mainly supported by staff from IRC and the Natural Resources Institute (NRI) from University of Greenwich. Other international partners that played a key role, especially in the research part of SWITCH in Accra, included IHE, ETC/RUAF and WEDC.

A SWITCH Steering Committee was formed to guide the Project in Accra, consisting of: Prof Dr. Esi Awuah (KNUST), Dr. Liqa Raschid-Sally (IWMI), Dr. Olufunke Cofie (IWMI), Mr Eugene Larbi (TREND, a Ghanaian Resource Centre, involved with other projects in Ghana with learning alliance approaches), Ms Bertha Darteh (LA facilitator). However, the Steering Committee met infrequently and therefore did not really play the guiding role that was foreseen initially (Verhagen, 2008).

Through its Learning Alliance, the SWITCH project collaborated with a range of local stakeholders at different levels and with different backgrounds. The table below present the key stakeholders involved in SWITCH activities.

General LA members	Issues, goals and aspirations
Ministry of Water Resources Works and Housing (MWRWH)	National policy on water related issues / overall responsibility for all water resources and water supply projects
Ministry of Local Government and Rural Development (MLGRD)	National policy on sanitation related issues
Ministry of Food and Agriculture	Policy related to food and agriculture, including on urban agriculture
Water Resources Commission (WRC)	Management of water resources in Ghana
Ghana Water Company Limited (GWCL)	In charge of Urban water supply
Aqua Vitens Rand Ltd (AVRL)	Operator/manager of the urban water supply system for and on behalf of Ghana Water Company
Hydrological Services Department	Stormwater management within cities like Accra.
Accra Metropolitan Assembly (AMA) <ul style="list-style-type: none"> • AMA Sewerage Unit • AMA Waste Management Department • AMA Planning Unit 	Treatment of waste water/ management of treatment plants Waste management in Accra Overall planning for the Accra

	Metropolitan Area
Municipal Assembly (LeKMA)	Overall planning and waste management in Ledzekuku-Krowor
Environmental Protection Agency (EPA)	Regulation of environmental pollution
Public Utilities Regulatory Commission (PURC)	Regulation of water services by water utilities
Water Research Institute (WRI)	Research on water related issues
Science Technology Policy Research Institute (STEPRI)	Research on policy planning on science and technology issues including water, sanitation and agriculture
Teshie Community	Clients / beneficiaries of water and sanitation services in Accra
Farmers Group (Secretary of Farmers Association)	Users of wastewater in Accra
Ghana Broadcasting Corporation Freelance Journalist of the Ghanaian Times	Media Reps

Table 1 Key LA members

Intervention logic of SWITCH Accra

The intervention logic of SWITCH could be summarised as:

- To support **an inclusive learning alliance** to ensure better linkages between urban water stakeholders in a city and between research providers and users.
- To strengthen and support integrated **strategic planning**, by developing a pro-poor strategic plan that is evidence-based and supported by a broad group of stakeholders.
- To strengthen the scientific basis for relevant elements of integrated urban water management through **applied research** that helps to fill gaps in local knowledge and provides a basis for improved strategic planning.
- To **test** and **demonstrate** the feasibility and potential of a few selected innovative pro-poor technologies and to enhance take up.
- To build local capacity and to address priority issues identified by the local learning alliance members through on-demand **training workshops**.
- To advocate for an integrated approach towards urban water management through wider **sector engagement**.

Meetings of the Accra Learning Alliance were planned to take place at half-yearly intervals. The over-arching objective of the learning alliance approach was to achieve better integration of urban water management through improved linkages between stakeholders involved in water management in the city, and to identify and develop realistic approaches that can be scaled up and replicated to improve integrated urban water management. The learning alliance approach was intended to stimulate better integrated urban water management, by providing a platform

for sharing and learning, but also for joint and integrated strategic planning. In order to achieve vision for Accra (Box 1), it was agreed there would be a need for a comprehensive integrated strategic plan, covering the different interlinked elements of the water cycle in Accra (water resources, water supply, waste- and stormwater management and possible reuse). The Accra Learning Alliance would provide the platform for the development of this plan.

The specific objectives of the Accra Learning Alliance thus were to:

- Bring stakeholders together and improve city level communication.
- Provide a platform for strategic planning.
- Improve linkage between research and practice, ensuring research is demanded and rooted in the reality of the city, rather than “blue-sky” research.

The learning alliance set out to improve access to data and information and to identify realistic approaches and technologies for improving urban water management in Accra. Applied research was to be undertaken on a variety of subjects covering the urban water cycle, including the use of natural systems for wastewater treatment and the reuse of wastewater for urban agriculture, as well researching social inclusion, governance and demand management. The focus was not only on generating new knowledge, but also on compiling, analysing and making available existing data and information on water management in Accra. Both existing and newly-generated knowledge were to be used in the strategic planning process.

SWITCH also included **demonstration projects** designed to test certain innovative technologies in practice, and to showcase these technologies to potential users, so as to enhance scaling up. The idea was to carry out demonstrations in relation to urban agriculture; aquaculture and wastewater reuse in Accra under the auspices of IWMI and the Department of Civil Engineering at KNUST (DCE-KNUST).

In order to build the capacity of local stakeholders on specific areas, **training workshops** were to be organised. The topics of these trainings were to emerge from the demands of stakeholders involved in the SWITCH project.

In addition, the SWITCH project was actively involved in other sector platforms, events and processes. The idea was that through wider sector engagement, SWITCH would be able to promote integrated urban water management and other SWITCH concepts and findings.

SWITCH Accra activities

Table 2 gives an overview of the activities undertaken under the SWITCH project in Accra between 2006 and 2010. Although the inception visit took place in mid-2006, SWITCH activities only really took off in 2007, with the launch of the Accra Learning Alliance and the start of various MSc theses research, especially related to public health risks of the urban water system, urban agriculture and the use of natural systems for the treatment of grey wastewater. Leading up to the first Accra stakeholders' meeting, where the Accra Learning Alliance was launched, SWITCH received quite a lot of media attention. Following the launch of the learning alliance, learning alliance members attended training workshops on urban agriculture, urban sanitation and the use of natural systems. During the urban agriculture workshop, plans were made for the demonstration of safe use of wastewater in urban agriculture, and this also started in 2007.

In mid-2007, the Accra Learning Alliance hosted a visioning and scenario building workshop, which kicked off a strategic planning process that has continued ever since. This also marked the start of data and information collection on water management in the city to feed into the strategic planning process. This included data on:

- Quantity and quality of water resources in and for the city.
- Infrastructure related to water supply, excreta and wastewater management and stormwater drainage.
- Current and future demand for water supply, sanitation and stormwater drainage services,
- The actual current access citizens of Accra have to these services, in terms of use of services, quality, accessibility and reliability of services, and costs of the various services.

A Resources, Infrastructure, Demand and Access (RIDA) framework⁷ was used to compile, review and analyse data and information collected from the "Accra starter kit" - a CD Rom containing data and information related to integrated urban water management in Accra, compiled by IWMI and KNUST, under the SWITCH project in 2007. These data were complemented by secondary

⁷ Resource-Infrastructure-Demand-Access (RIDA) is an analytical framework that helps to structure water related information logically and transparently. The concept is that users are linked to water resources by water supply infrastructure, and that each of these three system elements (resources, infrastructure and users) has its own set of institutions, boundaries and characteristics, that impact on access. *Resources* is the water that is available as rain, surface or groundwater; *infrastructure* is the equipment that is used to get, move, store, treat, and deliver the water (pipes and pumps etc.); *demand* is based on how many people there are and what are their demands for water (personal and livelihoods), and *access* includes barriers to access, coping strategies etc.

information and data collected with the assistance of Accra Learning Alliance members. A stakeholder analysis was followed by institutional mapping.

In 2008, a second demonstration focused on the use of urine in urban agriculture. MSc research took place on a variety of topics, including the potential of urine as a fertiliser, management of non-revenue water, the use of natural systems for grey water treatment, faecal sludge management and social inclusion. The facilitator started a PhD on learning alliance processes.

In 2009, the initial findings from the RIDA analysis, institutional mapping and social inclusion situational analysis were presented to the learning alliance. The strategic planning process continued, based on the findings of these and other SWITCH studies. The strategic planning process was finalised in 2010, with a one week workshop, during which strategic directions were formulated for water supply, excreta, wastewater and stormwater management and institutional coordination and integrated planning. The results of this workshop were combined with the findings from the RIDA, institutional mapping and social inclusion situational analysis to present a complete picture of the current situation of water management in the city of Accra and strategic directions for the future. This was presented to policy makers at the SWITCH policy forum. Research was also undertaken in 2010 on the management of non-revenue water of the Ghana Water Company Limited and on the application of city water balance in Accra.

Year	Research and demonstrations	Learning Alliance activities	City level sector engagement	Engagement in international forums
2006		<p>Production of an integrated City Story Line</p> <p>Recruitment of city facilitator and transfer of coordination role to KNUST</p>	Scoping mission	First SWITCH Scientific Meeting
2007	<p>Compilation of the Accra Starter Kit CD Rom</p> <p>LA Stakeholder Analysis</p> <p>Institutional Mapping Exercise started as follow up to the initial scoping exercise and stakeholder analysis</p> <p>Start of data collection activities for RIDA analysis</p> <p>Start of social inclusion situational analysis</p> <p>Initiation of demo on use of wastewater reuse in UA.</p> <p>MSC research:</p> <ul style="list-style-type: none"> •On public health risks of the urban water system in Accra (Lunani, 2007; labite, 2007) (WP 1.1) •On scenario development for urban water management in the Kpeshie catchment (Situmarang, 2007) (WP 1.1) •On public health risks of wastewater irrigation in Accra (Ibrahim, 2007) (WP 1.1 / 5..2) •On options for urban sanitation and urban agriculture (De Silva, 2007) (WP 5.2) •On Heavy metals uptake by vegetables (Sipitey, 2007; Chelteau) (WP 5.2) •Stephen: Grey water treatment using constructed wetlands at KNUST in Kumasi (Niyonzima, 2007; Muzola, 2007) (WP 5.3) 	<p>2 LA steering committee meetings</p> <p>1st LA workshop: stakeholders meeting on water and sanitation in Accra</p> <p>2nd LA workshop: visioning and scenario building workshop</p> <p>Training on use of natural systems for wastewater treatment</p> <p>2nd training workshop on the use of natural systems for wastewater treatment</p> <p>Training on use of water for urban agriculture and other livelihood opportunities</p> <p>2nd urban agriculture training workshop</p>	<p>Development of information brochure on SWITCH Accra</p> <p>Feature of city coordinator and facilitator on World Water Day programme on Ghana television and radio</p> <p>Development of City Website</p> <p>Development of briefing notes for stakeholders in Accra</p>	<p>LA Facilitation training for the SWITCH LA facilitators</p> <p>2nd LA training for facilitators in process documentation</p> <p>2nd SWITCH scientific meeting in Tel Aviv</p> <p>SWITCH social inclusion training in Delft</p> <p>SWITCH social inclusion training in Accra (includes visits to local community and urban farmers)</p> <p>LA learning and sharing workshop on M&E framework in Ghana</p>

2008	<p>Continuation of data collection activities for RIDA and analysis</p> <p>Initiation of demo on reuse of urine</p> <p>Accra LA facilitator starts PhD on learning alliances at NRI/University of Greenwich</p> <p>MSC research:</p> <ul style="list-style-type: none"> • On management of non-revenue water in Accra (Yeboah, 2008) (WP 3.1) • On the potential of urine as a fertiliser (Tetty-Luwor, 2009) (WP 4.1) • On the use of natural systems for grey water treatment (Ansah, 2008) (WP 5.3) • On faecal sludge management in Madina (Antwi-Agyei, 2008) (WP 5.3) • On social inclusion in WASH service delivery for the urban poor (Aboagye, 2008; Siabi-Mensah, 2008) (WP 6.3) 	<p>Update of SWITCH City Story</p> <p>3rd LA workshop: Training on IUWM Planning and kick off meeting for strategy development for LA vision</p> <p>City assessment exercise and process documentation</p> <p>LA steering committee meeting</p>	<p>Publication in Ghanaian times (April 1st) on the need for dialogue through LAs</p> <p>Presentation of SWITCH at Mole XIX Conference</p> <p>Presentation of SWITCH activities in Accra at World Water Week</p> <p>Engaging with politicians: presidential debate in 2008, (co) organised by SWITCH at KNUST</p> <p>First Junior Water Prize in Ghana, co-organised by SWITCH Accra</p>	<p>SWITCH Research School Training on Water Demand Management at WEDC Conference, hoisted by SWITCH Accra</p> <p>Video conference with Water Tribune/ Zaragoza Expo</p> <p>3rd SWITCH Scientific Meeting and LA sharing meeting in Belo Horizonte</p> <p>Participation in WEDC Conference Presentation of SWITCH and LA concepts.</p>
2009	<p>Start compilation of RIDA analysis, Social inclusion situational analysis and institutional mapping</p>	<p>4th LA workshop: strategic planning workshop (presenting the first RIDA results)</p> <p>5th LA workshop: strategic planning workshop and presentation of SWITCH research findings</p> <p>Update of SWITCH City Story</p>	<p>Presentation of SWITCH activities at World Water Forum</p> <p>Presentation of SWITCH activities at Mole XX Conference</p> <p>Participation in Ghana Water Forum/ distribution of flyers</p> <p>Meeting with DP and other stakeholders to discuss possible strategies for improvement of wastewater management in three city</p> <p>Presentation of results of strategic planning work to National Level Learning Alliance Platform (NLLAP⁸)</p>	<p>Participation in SWITCH Global cities summit by LA Members from Accra</p> <p>4th SWITCH Scientific Meeting</p>

⁸ The National Level Learning Alliance Platform (NLLAP) is a WASH sector platform with monthly thematic meetings organised by the Resource Centre Network Ghana, with the overall goal of improving sector learning and dialogue. In November 2009, SWITCH took the slot to present and discuss strategic planning for Accra. From every NLLAP meeting, a 2-page “WASH reflection” is produced. See <http://www.ghana.watsan.net/page/769> for the communiqué of the November 2009 meeting.

2 0 1 0	<p>Study by WEDC/ KNUST on assessing measures put in place GWCL to manage non-revenue water (WP 3.1)</p> <p>Integration of institutional mapping, RIDA, social inclusion situational analysis and strategic directions into the strategic directions document, made available to various stakeholders in draft form</p> <p>MSC research:</p> <ul style="list-style-type: none"> • Rebecca Simister: Application of city water balance in Accra 	<p>6th LA workshop: strategic planning working groups on water supply; wastewater management; planning and coordination; and finance</p> <p>Policy forum to present and discuss the strategic directions which had resulted from the strategic planning process</p> <p>2nd City assessment exercise in Accra</p>	<p>Participation in 2nd Ghana Water Forum and distribution of materials</p> <p>Presentation of RIDA at World Bank Programme Identification Meeting</p> <p>Involvement in SWAP workshops</p> <p>Involvement in Ghana urban platform</p> <p>Involvement in validation workshop of Urban Policy</p> <p>Involvement of SWITCH in preparation of AMA Medium Term Development Plan</p>	<p>Presentation of SWITCH Accra Activities at 15th AfWA congress in Uganda</p> <p>2nd SWITCH City Assessment Exercise: Meeting in Lodz</p> <p>Presentation at African Cities Sanitation workshop at the University of Surrey</p>
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Table 2 SWITCH Activities in Accra

III. RESULTS AND DISCUSSION

This section presents the results of the assessment undertaken in 2010 on the process, results and impact of the SWITCH project in Accra. This presentation of the results follows the intervention logic and gives an indication to what extent objectives of SWITCH Accra have been achieved.

The Accra Learning Alliance: Bringing urban water stakeholder together and improving city level communication

There is good evidence that a well-balanced and vibrant learning alliance has been established in Accra. Stakeholders identify closely with being a member of the Accra LA. They attend the meetings and workshops whenever possible and take an active part in the functioning of the LA platform itself.

Improving communication and linkages between stakeholders

The Accra LA workshops have been an important tool for improving linkages and communication between stakeholders, as it provides room for informal communication. There was an almost unanimous agreement that the LA approach has been bringing together many different stakeholders in a way that was not happening before in the Accra water sector. The learning alliance has provided a forum for national, regional and local stakeholders to meet and discuss issues in an open manner. Many members feel that they now know people in other organisations, departments, ministries and stakeholder groups whom they would not have met otherwise. This improved communication, as many stakeholders now feel they can contact each other directly when there is a need, without always having to go through official channels of communication.

“The LA approach allowed relationships to be built-up, information exchanged and above all, trust to be built between the members in an atmosphere of sharing”.

Interview with Dr Kwabena Nyarko, KNUST

Accra Learning Alliance members appreciate that the meetings are not stand alone activities, but part of a longer process and that there is follow-up to the meetings. Interviewees did suggest the LA process could have benefitted from smaller break-out focus groups, more frequent meetings and more interaction with SWITCH members from other countries.

“SWITCH meetings are different because they carry out follow-ups and monitoring of the workshops and make you feel that you are a real part of what is happening”.

Interview with Richard Oduro, AMA Planning Department

There was no clear communication strategy for SWITCH Accra. Communication with LA members took place by email, phone and through occasionally visits. Initially interactions with the various stakeholders, including Ministries, Water Services Departments and Local Government Bodies were somewhat formal. However, as the LA became more established and the trust between partners developed, communications became less formal. Because of the relationships that the facilitator built with LA members, stakeholders were towards the end of the project responding to e-mails far better than before.

"It took some time for stakeholders to engage with SWITCH. The launch of the National Water Policy (27th February 2008) proved to be a turning point. I studied the water policy document very carefully and found that there are a lot of things that SWITCH wants to do that the ministry wants to do as well. So I listed out the things and I wrote a newspaper article so that people would look at the policy in a different way, and to promote SWITCH. The title of the article was "The need for a national dialogue on water". I sent a copy to the Ministry. That is how I revamped my interaction with the Water Directorate. I mentioned to the Director of Water that I would like to discuss how SWITCH could collaborate with the Ministry and he showed interest. I started visiting the ministry every week and it was a very good thing to happen. I usually meet other stakeholders during such visits. They recognise me and they say jokingly: "there is SWITCH". I meet people from other Ministries as well".

Interview with Bertha Darteh, Learning Alliance Facilitator

To improve communication between stakeholders and to improve access to data and information, IRC introduced a number of e-based communication tools, including:

- A city website (www.switchaccra.wordpress.com).
- A stakeholder data base (www.switchaccra.wordpress.com/contact).
- A Google group (switchaccra@gmail.com).

Monitoring of these sites and responses to emails show that LA members do not use these channels as often as would have been expected. Google groups were not found to be useful especially as many organisations block such traffic through their servers. Most members interviewed had never or seldom visited the SWITCH website or the city website. Direct communication between LA meetings proved more effective when it was through face-to-face visits, telephone or email.

"In May 2007, the city webpage was set up. Since then, I have been updating the city page regularly. Most people in Ghana prefer face-to-face (and sometimes phone) interactions. Most people did not used to have easy access to internet. For persons at lower level management they may not even have computers or at best may have to share computers at the office. Where people have internet some are not very conversant with Google groups etc.

Towards the end of the project, the situation had changed, as a result of improved interaction between the SWITCH team and city stakeholders, and improved internet access. We are now able to have effective communication through the internet”.

Interview with Bertha Darteh, Accra Learning Alliance Facilitator

High level representation and social inclusion

To ensure the inclusiveness of the learning alliance, a detailed stakeholder analysis was undertaken by the facilitator in mid-2007. The stakeholder analysis identified key stakeholders whose input could be very useful for the platform as well as others who could be added to the LA. The stakeholder analysis gave the facilitator a better insight into relationships between the stakeholders and the way they interact with each other and provided her with an opportunity to further network with relevant stakeholders.

“The process of interviewing helps you to understanding what is happening out there, you are bonding with the stakeholders and they feel valued. It builds your network. The information will help you to deal with other stakeholders”.

Interview with Bertha Darteh, Accra Learning Alliance facilitator
(Verhagen 2008)

The Accra Learning Alliance has captured strong high level support. The kick-off workshop in 2007 was attended by the Mayor and various heads of departments within the Assembly and Metropolitan Planning and Water Management divisions. The 2010 policy forum was attended by about 30 key stakeholders from the urban water sector and from (local) government, including high level stakeholders and policy makers like the Chief Executive of Ledzokuku-Krowor Municipal Assembly, the Managing Director of the Ghana Water Company, Chief Operations Officer from AVRIL ATMA region, the Acting Executive Secretary of the Water Resources Commission and the Director of Water at the Public Utilities Regulatory Commission (PURC). Another real achievement of engaging with politics was the presidential candidate debate in 2008, which was (co) organised by SWITCH.

“SWITCH held the stakeholder platform together and provided a discipline of preparing and attending meetings/workshops. The Accra Learning Alliance included wide stakeholder representation from different levels and different sub-sectors”.

Interview with Mr Minta A Aboagye, Water Director, Ministry of Water Resources, Works and Housing

At regular learning alliance meetings, several Accra member institutions were presented by junior staff members who had no clear mandate from the home-organisation. Also, representatives changed frequently. This made it difficult to

run a smooth LA process, as discussions were often repeated and it was difficult to take decisions.

Efforts were made to include representatives from local communities and NGOs in learning alliance meetings. Representatives of farmer groups and community members of marginalised areas (from Teshie) have been taking part in LA meetings and workshops. There has been a high level of interaction with such groups during workshops and they have been given the opportunity to make contributions. They have also had the opportunity to learn from other LA members and improve their knowledge on city-wide and national level issues.

“When I participated in the Accra Learning Alliance at the Erata Hotel for the first time, in June 2009, I was welcomed and the people acknowledged my presence. When we were divided into groups for group work, the people in my group wanted to hear from me, what I thought. I did not feel restricted from participating. But I also listened a lot to the experts. During the meeting we have pushed good ideas. It is now up to AMA, GWCL to make use of this. We now need to monitor that they actually do that.

I reported back to my fellow farmers during our next monthly meeting. Initially, the other farmers thought the Erata meeting was about bringing funds to the farmers. I explained that that it was not like that, but that ideas were collected during the meeting, which would go to the central government to be acted upon. We hope that interventions would come to decrease microbial contamination of the storm water”.

Interview Bukari Fuseni, former secretary of Farmers’ Association

Monitoring and process documentation

Monitoring and process documentation was undertaken by the learning alliance facilitator. The LA facilitator started using micro scenarios for monitoring the SWITCH learning alliance process in Accra in 2007. This consists of micro scenarios related to 4 generic objectives that were agreed on by all SWITCH city learning alliances and 2 additional objectives specific to the Accra Learning Alliance. The micro scenarios helped guiding the activities of the LA facilitator, serving as a checklist of what she needed to do. This scoring was however done by the LA facilitator personally, without involvement or verification by the Accra Learning Alliance.

Process documentation took place through quarterly progress reports on activities of the LA, which were submitted to IRC (from May 2007 till the end of 2008), and annual city stories (2007, 2008 and 2009), which provided a picture on the progress of the entire SWITCH project in Accra, which were submitted to SWITCH management. This helped the facilitator and city coordinator to reflect on the activities of the past year and think about the year to come. Abstracts of the Accra city story were shared with learning alliance members in the form of shorter briefing notes. These were a useful source of information for LA members and enabled them to hold the facilitator accountable for what was happening within SWITCH in Accra.

SWITCH workshops were documented (including audio visual documentation) and they were evaluated by participants. Participant evaluations helped the facilitator to improve the organisation of meeting and events. Many participants indicated for example that they would like to have materials before the meetings, which was done.

Participatory development of strategic directions

An interesting metamorphosis of the Accra Learning Alliance has been observed as it evolved from a sharing platform into what has become more of a strategic planning platform. Strategic planning was not initially part of the brief, but it developed at a later stage as an LA initiative, which shows the power of the “demand led” methodology adopted by SWITCH.

Because of the lack of an existing integrated water management plan for the city of Accra, and its importance, the strategic planning process became the focal point for the LA, especially in the last three years of the project. Many key stakeholders consider the development of the Strategic Directions for Water Management in Accra as one of the key SWITCH deliverables in Accra.

“If we do not have a strategy and systems that involve the people in the water issues of Accra, then we will never solve the problems the city is facing”.

Interview with Eng Charlotte A Engmann, CWSA

The first two Accra LA workshops in 2007 had clearly highlighted the lack of easy access to the data and information on different aspect of water management in the city of Accra that is needed to inform a strategic planning process. It was suggested that a first step towards the development of an integrated strategic urban water management plan, would be the collection, compilation and analysis of data and information on water management and water related services in the city, to include water supply, excreta and wastewater management, stormwater management and flood prevention. A Resource, Infrastructure, Demand and Access (RIDA) framework was used to structure and analyse the data (see section 3).

The findings of the RIDA analysis on the current status of water management and water-related services in Accra and on projected future developments, were intended to serve as input for a working group that would build scenarios and develop strategic plans to achieve the 2030 vision as defined by the Accra Learning Alliance. However, despite the best efforts of the Accra facilitator to organise one, a working group never materialised. Most of the work on the vision, scenario building and the development of strategic directions took place through a series of LA meetings and workshops, while data compilation and analysis in

between workshops was done by a small team consisting of representatives from SWITCH consortium members, IRC, KNUST and IWMI.

This team used the data and information on population growth, water demand, current water production and water resources availability to build realistic scenarios, of the external and internal factors the city will have to deal with in the years to come. These scenarios were based on the broad narrative scenarios developed by the Accra Learning Alliance during the August 2007 workshop. These scenarios are presented in the box below.

Box 2 Scenarios

Worst case scenario

Accra in 2030 is a depressing, chaotic and crisis prone town. The population has exploded to more than four times its 2007 level of population. Water demands are almost six times higher than the capacity of the water supply system in 2007. Lack of effective political leadership, coupled with poor economic performance and severe poverty mean a lack of ability to tackle deep-seated problems of under-investment and poor management of water supply and sanitation infrastructure. These problems are made worse by lack of raw water resources due to increased competition and a reduction in river flows.

Medium case scenario

Accra has grown to almost three times its 2007 population, fuelled in part by strong economic performance based on oil wealth. This has led to sharply increased demand for water. This demand is augmented by the rapid growth in the tourism and manufacturing sectors. However, while rapid, this growth has not been chaotic – due in large part to the marked improvement in political culture and related enforcement of planning laws and other regulations. Climate change (and competition for water from outside the city) has led to a modest reduction in overall water resource availability, which together with the strong growth in demand (four times what it was in 2007), presents major challenges. These are compounded by lack of access to finances and land for new infrastructure. However, improved management and capacities within the utility (GWCL) and local government, new technological options and engaged and empowered citizens inspire confidence that solutions will be found.

Best case scenario

Accra in 2030 is in many ways a blessed city. Contrary to the fears of many in the early 2000s, the city's population growth, while large, has been manageable (2.2 times 2007 levels). The frequent power shortages of the early 2000s are only a distant memory. A sharply improved political culture has led to improvements in enforcement of planning laws, whilst policy is seen as progressive. This, coupled with strong economic growth (partly driven by increasing oil wealth), has led to marked improvements in citizens' willingness and ability to pay for water and sanitation services. Water demands have increased because of steady population growth and economic growth (three times as high as the capacity of the system in 2007). Challenges do exist. Overall water resource availability is reduced. It continues to be difficult to source the necessary financing to

upgrade the city's infrastructure and access to land for waste processing facilities and new networks is a constant problem. Nevertheless, there is guarded optimism about the ability of the city to deal with these problems.

In addition to the RIDA analysis, an institutional mapping and a social inclusion analysis were done to get a comprehensive picture of the current water management situation in Accra. Together, these studies provided a good overview of the current status of water management and water services in the city of Accra. The Accra Learning Alliance provided a platform for stakeholders to discussed strategic directions for going from this current situation, towards achieving the vision, as defined by the learning alliance. The narrative scenarios were used to test the different strategic options. The box below gives an example of this.

Assessment of options for serving people outside the reach of the GWCL system:

Option	Impact	Service provider costs	User costs		Time frame	Challenges	Feasible under scenario		
		CapEx (USD/cap)	CapEx (GH¢/cap)	Tarif (GH¢/m ³)			WCS	MCS	BCS
Independent community managed system	Medium (5,000-13,000 people per system)	Medium (83)	Medium – high (2.9 - 7.5)	Medium (1.66)	Short to medium	Resistance from GWCL/AVR L	yes	yes	yes
Independent private provider (Water Health)	Low (1000-3000 people per system)	Low (18)	None	High (5)	Short to medium	Presence and willingness of investor / donor	no	yes	yes
Rainwater harvesting	Low-medium	Not applicable	High (200)	Low	Short to medium term	Availability of space and financial resources at household level	yes	yes	yes

WCS = worst case scenario; MCS = Medium case scenario; BCS = Best case scenario

Table 3 Example of assessment of strategic options

The output of the strategic planning process was a document, presenting the situational analysis (from the RIDA, institutional mapping and social inclusion situational analysis), the vision as defined by the Accra Learning Alliance,

scenarios of external factors which have to be taken into account, and suggested strategic directions towards achieving the vision. Findings were presented to the

Accra Policy Forum in October 2010. The box below gives an overview of the proposed strategic directions.

One of the main recommended strategic directions to improve integrated urban water management in the city of Accra is the establishment of a planning and coordination platform, bringing together the different departments from the different municipalities, service providers and civil society.

Box 4 Strategic directions, as explored by the Accra Learning Alliance

In order to move from the current situation, as identified through the RIDA, institutional mapping and social inclusion situational analysis, toward the vision as set by the Accra Learning Alliance, the following strategic directions have been explored by the Accra Learning Alliance:

Water supply

- Decreasing demand through education, incentives, by-laws and possibly through tariff adjustments
- Improving GWCL water supply services:
 - Creating additional system capacity by expanding the treatment capacity of the GWCL system and exploring additional sources of raw water.
 - Decreasing physical losses through rehabilitation of the distribution system, better operation and maintenance and active leakage detection, including bulk metering.
 - Increasing GWCL revenues, through decreasing commercial losses (by further investments in customer meters and their on-going maintenance, improvement of the billing management system, community awareness raising and education and active monitoring of the distribution system) and possibly through increasing the tariff.
 - Improving access to GWCL system through innovative approaches for connecting the poor and acknowledging alternative approaches to providing water to people who are not able to connect to the GWCL directly, like standpipes and community-managed bulk water supply.
- Lowering water prices for low income households, through special consideration in the water tariff for compound housing and through recognition, registration and regulation of alternative service providers.
- Improving access to water services for communities and households outside the reach of the GWCL network, through independent privately managed systems, community managed systems and self-supply (e.g. rainwater harvesting).

Excreta and wastewater management

- Improving access to private sanitation facilities, which can be done through the enforcement of by-laws for the construction of household latrines, the facilitation of appropriate technology choice and awareness creation and education.
- Improving public latrine services by increasing the number, ensuring adequate water supply and improving their management.
- Increasing treatment capacity. Under the Accra sewerage improvement project, there are plans to extend the sewer system. However, even when fully successful, the impact of this intervention will be relatively small. Therefore, additional strategies are needed like securing, acquiring and maintaining sludge treatment sites; rehabilitating existing ones; and using natural systems.
- Improving the use of existing treatment capacity by increasing the number of connections to the sewer system and by building the capacity of the sewerage unit staff.

Stormwater management

- Improving stormwater discharge by improving and maintaining the stormwater drainage system and by ensuring drains do not become clogged by solid waste.
- Reducing surface water run-off by applying sustainable urban drainage systems (SUDS), developing and maintaining a green belt around the current built up area, where urban agriculture can be practised and by promoting rainwater harvesting.

Institutional coordination and planning

- Facilitation of a 'Greater Accra Metropolitan Area Integrated Urban Water Management Planning and Coordination Platform' for city wide planning alignment and development of water and sanitation services.
- Resolution of ambiguities regarding the respective roles of the municipalities and Ghana Water Company Limited in providing water services.
- Resolution of ambiguities on responsibilities for drainage.
- Resolution of ambiguities regarding responsibilities for wastewater management at the local authority (Metropolitan/Municipal Authority) level.

The strategic planning process provided the opportunity for the Accra LA members to get to grips with exploring what the real challenges relating to water management in Accra are and what could be feasible solutions. One interviewee said: *"Initially we came up with a lot of fluffy ideas but were soon able to start to focus on the ones that we needed to follow up on."* During the June 2009 strategic planning workshop, the Accra Learning Alliance was the scene of a discussion about the Accra Sewerage Improvement Project, which was initially perceived by participants as the solution for excreta and wastewater management in Accra. However, assessing this option in a smaller working group during this workshop, taking into account population growth and increase in water use, made LA members realise this was only a (very) small part of the solution, moving towards achieving the vision, and stressed the need for looking at options beyond sewerage.

“SWITCH really enabled the Assemblies to see that Integrated Water management was the most appropriate approach for dealing with the issue at municipal and inter-municipal level. The SWITCH Intervention was very welcome. As the Directorate takes on more and more responsibility for the coordination of the sector and gathering of information, the work that has been done on developing the RIDA and Strategic Plan will be very useful to the whole water sector”.

Interview with Mr Minta A Aboagye, Water Director of the Ministry of Water Resources, Works and Housing

Research: Filling knowledge gaps for strategic planning (?)

Initially, the research done under the SWITCH project, especially in the first two years of the project in Accra did not necessarily respond to research demands, as identified during the inception visit and the first stakeholder / LA meeting in 2006 and beginning of 2007. Research seemed focused on interest areas of the SWITCH researchers, rather than on interest areas of the broad city level stakeholders.

Along the course of the project, links between researchers and practitioners seem to have improved. The learning alliance platform meetings and training workshops gave researchers involved in SWITCH Accra the opportunity to interact more with sector practitioners. Sector practitioners were involved in the development of research and demonstration methodologies for research undertaken by SWITCH on urban agriculture (WP 5.2) and natural systems for treatment of wastewater WP 5.3), through training workshops.

The improved linkages between practitioners and researcher resulted in research topic emanating from actual needs on the ground and research being more rooted in reality. Examples of how on-demand research ideas were formed include:

- The RIDA analysis was done as a response to lack of a comprehensive overview of data and information on water management and water related services in Accra, as identified by researchers and sector practitioners during the inception visit and first LA workshops. The compilation and analysis of data and information done under the RIDA analysis was used in the strategic planning process. It provided a comprehensive overview of the situation in Accra and brought out the main challenges related to water supply, water resources, excreta, and wastewater and stormwater management that would have to be addressed in order to move towards the vision of Accra in 2030, as defined by the Accra Learning Alliance (see Box 5).
- Through interactions between SWITCH researchers and sector practitioners in 2007, a high demand for faecal sludge management

research was identified. This was taken up in research for an MSc thesis. This identified weak enforcement of sanitation by-laws and lack of a regulatory framework as major problems for effective management of faecal sludge. The results provided an input into the training materials of the faecal sludge management training workshop organised by SWITCH in July 2010.

- As a result of training on natural systems (WP 5.3) in 2007, it was agreed that studies should be done on the wastewater treatment potential of the Kpesie lagoon. Research by a KNUST student and other SWITCH research showed good potential of natural systems and a constructed wetland for treatment of grey water, improving turbidity, suspended solids, COD (chemical oxygen demand), BOD (biological oxygen demand) and total coliform among others. The natural wetlands showed better results when compared with the constructed wetland.

Box 2 Results of the RIDA and institutional mapping: water management challenges for the city of Accra

Governance challenges

- Inadequate planning and coordination
- Functional duplication
- Challenges of long term strategic planning
- Lack of enforcement

Water supply challenges

- Demand is higher than the capacity
 - design capacity: 84-96 per cent of the 2007 demand
 - 2007 production : 72-82 per cent of 2007 demand
- The systems are not used to their full (design) capacity
 - production is 85 per cent of design capacity
- Non-revenue water is very high (59 per cent)
- Low income households use less water than high income households but pay more per unit water

Sanitation challenges

- Lack of treatment capacity
- Existing excreta collection and treatment facilities not functional
- 4.3 per cent of the population practices open defecation or uses unhygienic bucket or pan latrines
- Low income households depend on public latrines, providing lower services levels against higher prices

Stormwater drainage challenges

- Inadequate storm drainage system
- Increasing surface run-off caused by decreasing permeability

Researchers used the learning alliance meetings to share and get feedback on research objectives and findings. This provided stakeholders with new insights and knowledge. For example the research results from SWITCH studies, showing a good potential of natural systems for the treatment of grey water was considered an eye-opener by various LA members, when it was presented at the November 2009 LA workshop.

Drafts of the results of the RIDA analysis were shared with stakeholders for validation, through presentations at learning alliance meetings and by making the draft available to LA members for comments and feedback. As this draft document brought together a large body of information and data that had not really been brought together in that way before, the drafts were well received by stakeholder, who considered them as key documents and a major “gift” from SWITCH in Accra. Various stakeholders, including students and other researchers, but also sector practitioners started using and referring to the drafts. Findings from the RIDA analysis have, for example, appeared in presentations done by sector stakeholders, like AVRIL and the World Bank and were used for proposal development by GWCL. This positive response is probably due to the fact that this was the first time that a real data collection exercise has been carried out across the different elements of the water cycle in Accra.

“One really important aspect of the RIDA was the costs analysis along the water supply chain. This was the first time we have seen what the costs of the various modes of supplying water to the community are – right from the network through to tankers and sachets and this has really brought some clarity to the whole debate”.

Interview with Mr Minta A Aboagye, Water Director of the Ministry of Water Resources, Works and Housing

Results from SWITCH research were intended to be included and incorporated as much as possible in the RIDA analysis and to inform the strategic planning process. Several SWITCH researchers participated in the learning alliance workshops focused on strategic planning, bringing in their points of view and results from research into the strategic planning process. However, to a large extent the SWITCH team working on the RIDA analysis and facilitating the strategic planning process, worked in isolation from other researchers involved in SWITCH research in Accra. Furthermore, beyond coordination around logistics there was limited coordination on these studies between the SWITCH consortium members. It is no surprise, therefore, that linkages between the research activities and the strategic planning activities are not evident. In addition to the lack of coordination of SWITCH activities in the city, the fact that research areas had to a large extent been identified prior to the formulation of the strategic planning exercise, and were therefore not all relevant for the strategic planning process, contributed to this partial mismatch of the research and the strategic planning process.

In general, there have been challenges related to coordination between SWITCH consortium members involved in the project in Accra. Researchers were reporting to their respective work package leaders rather than to the city level coordinator or LA facilitator. This hampered in-city communication and coordination between the work done under different work packages.

“SWITCH could have been a better project than it was if the coordination would have been stronger. There was a big issue related to aligning interests of research and the reality on the ground and ensuring that researchers respond to the expectations of the Accra LA”.

Interview with Dr. Olufunke Cofie, IWMI

It has been suggested that it would have been useful if the LA establishment process, including stakeholder analysis and visioning, scenario building and strategic direction development, had been done before the research areas had been determined. This would have made the research more demand based and would have supported an evidence based strategic planning process.

Demonstrations: Putting innovation into practice

Unlike a number of other SWITCH Demonstration Cities, Accra did not have a well-defined demonstration programme and took the view that *“Detailed demo activities will be identified and defined through participatory involvement of all stakeholders within the LA team”* [SWITCH August 2005]. Although very much in line with the demand-led philosophy of SWITCH, this did provide a challenge related to acquiring the 65% match funding required for demonstration activities under the SWITCH Project. The WASH sector in Ghana is largely funded by international donors and local funding opportunities are limited. Most international donor no longer fund separate small-scale projects but prefer basket funding or large-scale programmes.

Nevertheless, two relatively small demonstrations were executed in Accra within the framework of the SWITCH project, in close cooperation with the RUAF Foundation⁹:

- The safe use of wastewater in urban agriculture.
- The use of urine in urban agriculture.

The objective of the first demonstration in Accra was to test wastewater risk reduction methods to ensure livelihoods of farmers and other beneficiaries in the food supply chain while safeguarding public health concerns.

⁹ The RUAF Foundation is an international network on Urban Agriculture and Food Security with one global resource centre and seven regional resource centres, including SWITCH consortium partner IWMI.

The demonstration took place with farmers at the Dzorwulu-Roman Ridge site, one of the largest urban agricultural sites in Accra covering an area of 8.3 ha. Here, individual ponds and networks of interconnected ponds, managed by a group of farmers, are used for irrigating small plots. Under the demonstration, an existing 5-pond network was upgraded for enhanced risk control. Farmers participated in construction and maintenance. Steps were built to facilitate entry into ponds and to avoid sediment re-suspension. Simple baffles were placed to increase the water retention time. The design doubled the water volume and reduced “short-circuiting” (rapid flow), increasing the overall water retention time from one to two days. Trenches were slightly widened and ponds were deepened and their shapes made more regular. The improved systems enhance faecal coliform removal from 10^6 - 10^7 MPN/100ml by at least 2 log units from the first to the last pond. Individual ponds showed a removal of 1-1.5 log units over two days (Cofie, 2008).

Whilst this demonstration might not have illustrated a perfect technology, it did show that farmer initiatives can contribute to pathogen reduction and offer opportunities for improvements through participatory research.

In a second urban agriculture demonstration project, farmers were shown how to store urine on the farm site in mini tank units (Tettey-Lowor, 2009). This demonstration project was implemented in collaboration with Safi Sana. The urine was collected from the public urinals in Accra. One farmer had volunteered to provide a small part of his land. The plot was divided into 6 parts, where different combinations of inputs (urine, manure, fertiliser, compost) were applied. The application of urine in addition to manure proved to produce the best results. However, there proved to be challenges related to salinity.

“From the demonstration, it appeared that the poultry manure + NPK fertiliser did best, but it also had a lot of negative effects, like rotting. Also the plants were big, but not that heavy. The plants cultivated with urine had a better weight and tasted good, according to all. I advise others to use urine plus manure. However, the urine is salty. This is a problem in the dry season. I would not use urine on all my beds, especially not in the areas which are salty already. The urine was brought by the project. I would not buy urine. Nobody would. Because of my involvement in the SWITCH demonstration and other research, I won the 2008 best innovative farmer award”.

Interview with Mr Musa Ahmed Ibrahim, urban agriculturist

Although the demonstration has raised the interest of many farmers, uptake of the use of urine on a larger scale has been limited. This is probably due to problems with salinity, but also with perceived health risks by consumers. In addition, the demonstration found that changes in the supply chain of the urine would be needed to ensure scaling-up (Cofie, 2009).

“All farmers from all sites have heard of the SWITCH demonstration. All were invited to see the results. Other farmers asked questions, e.g. about the salt aspect and health aspects. Many of them think we already have a public concern with the coliforms, and the use of urine would even raise public concern further”.

Interview with Mr Bukari Fuseni, former secretary of the Dzorwulu Urban Farmers’ Association

Other demonstrations were contemplated. Within the social inclusion work package, it was clear that social inclusion could not carry out stand-alone demonstration projects but that it needed to be seen as a cross-cutting issue for all demonstration projects in Accra. For that reasons, a baseline study was carried out for the urban agriculture demonstration projects and at the end of the SWITCH project, a review will be carried out for the two demonstration projects that have been carried out in Accra.

Considerable efforts have been undertaken to initiate other additional demonstration projects. Opportunities were explored to realise demonstrations related to rain water harvesting, the construction of community latrines and collaboration with PURC to monitor the social inclusiveness of pilot community water supply project in certain slums in Accra. However, none of these resulted in demonstration activities on the ground.

Even though the rainwater harvesting demonstration never materialised, the interaction between the LA facilitator and the Chief Executive of LeKMA (Ledzokuku-Krowor Municipal Assembly) on the topic of rainwater harvesting in preparation of developing the demonstration proposal, did contribute to LeKMA reducing the costs of building permits for buildings with rainwater harvesting.

Training: Building capacity and changing minds

Training workshops were organised on demand for stakeholders and have been positively received. The training events were full and participants were very engaged. Participants mainly came from decentralised (regional and municipal) offices of various department Stakeholders seem hungry for knowledge and are willing to pay for training that provide information and knowledge on a topic of their interest.

LA members indicated they gained new knowledge and new ideas through their involvement in SWITCH workshops and training sessions, which could be useful in their daily work. Involvement in SWITCH workshops and training events opened peoples’ minds for doing things differently. People from the Accra Metropolitan Area found that SWITCH research results might have a long-term impact on by-laws.

Sector engagement: Influencing sector discourse and promoting the concept of Integrated Urban Water Management

Sector engagement was initially focused on awareness raising about the SWITCH project, through the development and distribution of brochures and through attracting media attention. Prime time exposure on the Ghana Television news was very effective in giving credibility to the SWITCH team and enabling a rapid transfer of information about the SWITCH Project.

In order to advocate for the importance of improved IUWM, the Accra LA facilitator participated in a large number of sector meetings and events, including the annual Mole conferences, organised by the Coalition of NGOs in the Water and Sanitation Sector in Ghana, the Ghana Water Forum, organised on annual basis by the Water Directorate, and workshops organised by the World Bank as preparation of their urban water project.

Engagement with stakeholders at learning alliance meetings, and through follow-up visits, phone calls and e-mails in between visits strengthened relations between the SWITCH Accra team and stakeholders.

As more research results emerged, SWITCH increasingly gained recognition in the sector. The LA facilitator and city coordinator became well-recognised sources of information on water management in the city of Accra and were increasingly approached to provide input in sector processes, related to improving integrated urban water management. For example:

- The city coordinator and LA facilitator were requested to give input to the World Bank programme identification process. The LA facilitator was invited to present the RIDA analysis and the strategic directions that SWITCH proposed at different forums, including the World Bank project identification workshops, which were undertaken as a scoping exercise for a multi-million urban water management programme. This could facilitate uptake of the proposed strategic directions in future.
- The city coordinator and LA facilitator were asked by the Accra Metropolitan Assembly to contribute to the development of the sanitation part of their Medium Term Development Plan.
- The city coordinator was requested to give feedback on sector policies, like the National Environmental Sanitation Action Plan and the National Environmental Sanitation Policy and to take part in the annual sector review.

Way forward after SWITCH

When asked which activities should be taken beyond the scope of the project after the project finishes in 2011, interviewed stakeholders identified the following:

- The learning alliance should continue perhaps as a Strategic Planning Alliance, as it is already becoming known.
- The Strategic Planning Direction Report.

“We would really appreciate if SWITCH could prepare a proposal to somehow define the Coordination Platform/Strategic Planning Group and include some recommendations on the key milestones for implementation, meetings and reviews, etc. Then they could adopt this to guide them through the first year for example. The City Web Site could/should be a useful means of communication where all this very useful data that has been gathered by SWITCH can be held and updated. How can this be achieved best?”

Interview with Collins Tay, Senior Research Scientist, Water Research Institute

There is agreement on the fact that there is a need for better coordination at city level and there is ongoing discussion on how to bring different municipalities together

There is a widespread enthusiasm for the RIDA framework, for the data collection and for the strategic planning work that has been facilitated through the Accra LA. There is an opportunity to encourage the uptake of this work by making a proposal to guide and assist the members of the LA to continue the platform, in whatever shape it needs to be, after the end of the SWITCH project. This would be a relatively small amount of effort to prepare such a guide and also to look for potential owners/linkages for the upkeep of the City Web Site.

Besides these activities at Greater Accra Metropolitan Area level, there are also promising follow-up activities related to improved integrated urban water management at municipal level. An example of this is the fact that the Chief Executive of the Ledzekuku-Krowor Municipal Authority (one of the municipal Authorities of the Greater Accra Metropolitan Area), has requested the LA facilitator and City Coordinator to assist the municipality in developing a water master plan.

IV. CONCLUSION AND RECOMMENDATIONS

The SWITCH project intended to improve urban water management in cities by challenging the “status quos” or business-as-usual approaches. In Accra, a city

which is facing ever increasing difficulties in managing water resources and providing water and sanitation services to all its citizens, this was most notably achieved through:

- Bringing stakeholders together, who might not otherwise meet. This was achieved in the lively, well attended and highly appreciated Accra Learning Alliance, improving linkages and communication between stakeholders.
- Improving linkages between researchers and city stakeholders, which has led to more demand-based research, better rooted in sector realities and a sector discourse that is more evidence-based.
- The collection, compilation and analysis of data and information on water supply, excreta, wastewater and stormwater management, using a RIDA framework, which was an innovation in itself within the framework of water management in Accra.
- An integrated strategic planning process facilitated by SWITCH.

A strong, inclusive Accra Learning Alliance seems to have improved linkages and communication between stakeholders in the Accra water sector. Although the LA meetings and workshops were important events in the learning alliance process, interaction with stakeholders between meetings were also vital.

Monitoring and process documentation was done primarily by the LA facilitator, without intensive involvement of LA members. This was useful for the facilitator, as it forced her to reflect on past activities and take corrective action for future activities. Sharing results of the process documentation with LA members in digestible form, contributed to keeping LA members engaged in the SWITCH Accra process.

The learning alliance provided a good platform for the strategic planning process. At the same time, the strategic planning process enabled the Accra Learning Alliance to go beyond a platform that would be only used for developing and sharing research. Although the process in between the LA meetings was less participatory than originally planned (city stakeholders provided data and information, but data collection, analysis and writing was mainly done by a SWITCH team), this process has resulted in a highly appreciated situational analysis and strategic directions.

SWITCH research was only partly successful in responding to knowledge gaps on water management in the city of Accra and providing input to the strategic planning process. Rather than state of the art research on “innovative” technologies and approaches, the research that seems to have had the biggest impact in Accra, has been the rather simple collection, compilation and analysis of secondary data on different elements of the urban water cycle, using a RIDA framework. The fact that drafts of this study were widely shared with LA

stakeholders for feedback and validation probably contributed to wide recognition and use of the study by stakeholders.

Linking the various pieces of research undertaken under the SWITCH project to the strategic planning process has been a challenge. It would have been useful if reporting on all the activities and results on SWITCH activities in Accra, including research activities and results, had included the city coordinator and LA facilitator, so that they could help to better coordinate research and synergise the results. Communication and reporting lines should not only have been concentrated “vertically” within work packages, but also “horizontally”, between work packages at different levels, including at city level.

Demonstration projects have only taken place on a limited scale in Accra, and scaling up of the demonstrated technologies and approaches has been limited, but there is still opportunity to learn from the results.

Engagement of SWITCH in the sector changed over time, from proactively seeking opportunities for sharing SWITCH ideas through the media, meetings and direct interactions with stakeholders, to being invited to present ideas and findings at various sector forums. This suggests that SWITCH and its ideas are being taken seriously and taken up in the urban water sector in Accra.

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References

- Abraham, E. M. van Rooijen, D. Cofie, O. Raschid-Sally, L., 2007. *Planning urban water - dependent livelihood opportunities for the poor in Accra, Ghana*, SWITCH Scientific Meeting, University of Birmingham, UK, 9-10 Jan 2007.
- Adank, M. Darteh, B. Moriarty, P. Osei-Tutu, H. Assan, D. Rooijen, D. van, 2011. *Towards integrated urban water management in the Greater Accra Metropolitan Area, Current status and strategic directions for the future*, SWITCH/RCN Ghana, Accra, Ghana
- AMA, 2006. *Greater Accra - Physical Characteristics*, A Public- Private Partnership Programme between Ministry of Local Government and Rural Development and Moks Publications & Media Services. Available at: http://www.ghanadistricts.com/districts/?r=1&_sa=3000 [Accessed 14 April 2011]
- Cofie, O., 2008. *Improving on-farm ponds for wastewater treatment in Accra, Ghana*. Poster developed as part of the SWITCH Project, IWMI, Accra, Ghana
- Cofie, O., 2009. *Urine in Urban Agriculture in Accra, Ghana*. Poster developed as part of the SWITCH Project, IWMI, RUAf, SWITCH, Safi Sana Ltd, Accra Ghana
- Darteh, B., 2008. *Accra City Story – SWITCH Project - March 2008*. Available at: <http://www.switchaccra.wordpress.com>
- GSS, 2002. *2000 population and housing census; summary report of final results*. Ghana Statistical Service, Accra, Ghana.
- GSS, 2008. *Report of the fifth round of the Ghana Living Standards Survey*, Ghana Statistical Services, Accra, Ghana.
- Morris, M. Adank M. Cofie, F. Howe, C., 2006. *Support Team Visit Report, 26 - 30 June 2006*, SWITCH Project.
- Obuobie, E. Keraita, B. Danso, G. Amoah, P. Cofie, O.O. Raschid-Sally, L. & Drechsel, P., 2006. *Irrigated urban vegetable production in Ghana: Characteristics, benefits and risks*. IWMI-RUAf-CPWF, Accra, Ghana. Available at: <http://www.cityfarmer.org/GhanalrrigateVegis.html> [Accessed 14 April 2011]

Tettey-Lowor, F., 2009. *Closing the loop between sanitation and agriculture in Accra, Ghana, Improving yields in urban agriculture by using urine as a fertilizer and drivers & barriers for scaling-up*, MSc thesis report, Wageningen University and Research Centre, the Netherlands.

Twum-Baah, K.A., 2002. Population growth of Mega-Accra: emerging issues. In: Mills-Tettey, R., & Adi-Dako, K., eds. *Visions of the City, Accra in the 21st Century*. Woeli Publishing, Accra, Ghana.

WHO/UNICEF., 2010. *Joint Monitoring Programme for Water Supply and Sanitation*. Available at: <http://www.wssinfo.org>
[Accessed 14 April 2011]

Acronyms

AMA	Accra Metropolitan Assembly
AVRL	Aqua Vitens Rand Limited
ASIP	Accra Sewer Improvement Project
CfAW	Centre for African Wetlands
CONIWAS	Coalition of NGOs in the Water and Sanitation Sector
CWSA	Community Water and Sanitation Agency
DCE	Department of Civil Engineering (at KNUST)
EPA	Environmental Protection Agency
ETC/RUAF	ETC Foundation / Resource Centre on Urban Agriculture and Forestry
EU	European Union
GAMA	Greater Accra Metropolitan Area
GWCL	Ghana Water Company Ltd.
HSD	Hydrological Services Department
ICTs	Information and Communication Technologies
IRC	IRC - International Water and Sanitation Centre
IS	Innovation System
IUWM	Integrated Urban Water Management
IWMI	International Water Management Institute
IWRM	Integrated Water Resources Management
KNUST	Kwame Nkrumah University of Science and Technology
KVIP	Kumasi Ventilated Improved Pit latrine
LA	Learning Alliance
LeKMA	Ledzokuku-Krowor Municipal Assembly

Lpcd	Litres per capita per day
MLGRD	Ministry of Local Government and Rural Development
MMA	Metropolitan and Municipal Assemblies
MMDA	Metropolitan, Municipal and District Assemblies
MOFEP	Ministry of Finance and Economic Planning
MWRWH	Ministry of Water Resources, Works and Housing
NGO	Non-Governmental Organisation
NLLAP	National Level Learning Alliance Platform
NRI	Natural Resources Institute, University of Greenwich
PURC	Public Utilities Regulatory Commission
RIDA	Resources, Infrastructure, Demand and Access framework
RUAF	Resource Centres on Urban Agriculture and Food Security
STEPRI	Science and Technology Policy Research Institute
SWITCH	Sustainable Water management Improves Tomorrow's Cities' Health
TMA	Tema Metropolitan Area
TREND	Training Research and Networking for Development
UNESCO-IHE	Institute for Water Education, Delft, The Netherlands
UWM	Urban Water Management
WEDC	The Water, Engineering and Development Centre, Loughborough, UK
WP	Work Package
WRC	Water Resources Commission