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# **Independent and small scale urban water providers in Kenya and Ethiopia**

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## Abstract

In many urban centres of developing countries a large population is without access to water or are poorly served by the official water utilities. These rely on independent and small scale water providers (I&SSWPs). Such providers largely operate unofficially. Their role is often ignored or misunderstood and described negatively. This research aimed at examining water provision by I&SSWPs and the need to intergrate their services into the formal water supply as a possible means of improving water provision.

The research was done through household water usage study and analysis of I&SSWPs. Key water stakeholders were also involved. Questionnaires, interviews, focus group discussions and workshops were used. In addition, water quality monitoring involving supply chain analysis combined with sanitary inspections was carried out.

I&SSWPs operating under various business models bring basic water services to households in areas served. Water provision by I&SSWPs is complex resulting in interactions and overlaps between the formal and informal water provision. Some provide a 'virtual piped network' while where households have their own connections to official piped network discontinuity makes I&SSWPs the main sources. Through I&SSWPs with their own sources, households per capita water use improved remarkably. I&SSWPs generally operate competitively. Cost of water from I&SSWPs without their own sources is high for poor households, but would be pro-poor strategies are ineffective. I&SSWPs' income and profits vary, but water selling remains an important means of sustaining livelihoods. Although house-hold decision makers understand the importance of choosing safe drinking water, access factors can supersede resulting in the use of poor quality sources provided by some I&SSWPs.

This research demonstrates the need to reconcile the vital services I&SSWPs provide with the need to improve practice to protect users and make services affordable. Consumers will benefit if the role I&SSWPs play can be recognized and enhanced to improve water provision.

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## Acronyms

AAWSA	Addis Ababa Water and Sewerage Authority
ADB	Asian Development Bank
ANOVA	Analysis of variance
BOT	Build operate transfer
CBOs	Community Based organisation
CBS	Central Bureau of Statistics
CFUs	Colony forming units
CI	Confidence Interval
CRC	Convention on the Rights of the Child
CSO	Civil Society Organisations
DALYs	Disability-Adjusted Life Years
DMM	Delegated Management Model
DWO	Drawers of Water
FDRE	Federal Democratic Republic of Ethiopia
FGDs	Focus Group Discussions
GOK	Government of Kenya
IBT	Increasing block tariff
ICESCR	International Covenant on Economic, Social and Cultural Rights
IDDWS	International Decade for Drinking Water Supply and Sanitation
I&SSWPs	Independent and Small- Scale Water Providers
ISO	International Standardization Organization
JICA	Japan international Development Cooperation
JMP	Joint Monitoring Programme
KShs.	Kenya shillings
KIWASCO	Kisumu Water and Sewerage Company
LVSWSB	Lake Victoria South Water Service Board
Max.	Maximum
MDGs	Millennium Development Goals
Mdn.	Median
MF	Membrane filtration
Min.	Minimum
MLSB	Membrane lauryl sulphate broth
MO	Master Operator
MoFED	Ministry of Finance and Economic Development
MPN	Most Probable Number
MSMEs	Micros, Small and Medium-Sized Entities
NGOs	Non Governmental Organizations
NSPs	Non-State water Providers

NWCPC	National Water Conservation and Pipeline Corporation
OECD	Organisation for Economic Cooperation and Development
PSP	Private Sector Participation
PWTs	Public water taps
RCPEH	Robens Centre for Public and Environmental Health
SANA	Sanitation Aid in Africa
SDE	Senegalaise des eaux
SIWI	Stockholm International Water Institute
SMEs	Small and micro-enterprise
SODECI	Societe de distribution d'eau de la Cote d'Ivoire
TTC	Thermotolerant coliforms
TU	Turbidity unit
UfW	Unaccounted-for-Water
UShs	Ugandan Shillings
UK	United Kingdom
UN	United Nations
UNESC	United Nations Committee on Social and Cultural Rights
UNCHS	United Nations Centre for Human Settlement (UN-Habitat)
UNCSD	United Nations Commission for Sustainable Development
UNDP	United Nations Development Programme
UNFPA	United Nations Population Division
UNICEF	United Nations Children's Fund
USA	United States of America
USAID	United States Agency for International Development
USEPA	United States Environmental Protection Agency
USV	Union of Vacuum-truckers
US\$	United States Dollar
VIRED-Int.	Victoria Institute for Research on Environment and Development
WSREB	Water Services Regulatory Board
WEDC	Water and Environment Development Centre
WHO	World Health Organisation
WSBs	Water Services Boards
WSREB	Water Services Regulatory Board
WSSA	Water Supply and Sanitation Authority
WSP	Water and Sanitation Programme of the World Bank East Asia Office
WSP	Water and Sanitation Programme of the World Bank
WSPs	Water Services Providers
WTP	Willingness to pay
WUP- Africa	Water Utility Partnership for Capacity building (Africa office)



## **Chapter 1 Introduction**

### **1.1 Problem Statement and Aims**

Water is essential for sustenance of life. Everyone needs water and has to obtain water for survival. Access to water for drinking and other domestic uses is important for improving health (UNICEF & WHO, 2005). There is also a strong link between socio-economic growth, general human development and improved access to adequate and safe water supplies (Stockholm International Water Institute [SIWI], 2005; UNDP, 2006). Several efforts have therefore been directed at making access to safe water one of the top priorities in the international development agenda, for both developing countries and international development institutions. Evidence for international commitment to improving access to water supply spans from the International Decade for Drinking Water Supply and Sanitation (IDDWS) -the 1980s- to the United Nations Millennium Summit in 2000 and the resultant Millennium Development Goals (MDGs), by which a commitment was made to halve by 2015 the number of people without sustainable access to safe drinking water. This was followed by the Johannesburg Earth Summit in 2002 (United Nations Commission for Sustainable Development, 2002). However, the challenge of achieving this target is enormous and requires innovative approaches and concerted efforts from all involved in the water supply sector.

Notwithstanding the importance of water and the efforts so far made a review of the literature shows that a large number, over 1.1 billion people living in developing countries still lack access to safe drinking water (UNDP, 2006). The majority of these people are found in rural areas (UNICEF & WHO, 2005; 2006), but urban populations are also expanding rapidly (UNFPA, 2007), and already many urban households have little or no access to water supplies that are reliable and of good quality. The lowest drinking-water coverage levels are in sub-Saharan Africa and Oceania. But this is more pronounced in sub-Saharan Africa where 431 million of those with no access to improved water live, and the populations are growing faster than improvements to water availability (UNICEF & WHO, 2005; UNDP, 2006).

Many developing countries choose to provide services such as water supply through government departments or public enterprises (Solo, 1999). However, for various reasons

these public water supply utilities have been slow in extending water supply services (WHO & UNICEF, 2000; World Bank, 2004b), as is evidenced by the large number of people in developing countries, still lacking access to safe drinking water. From the 1990s, the international community and donor agencies (multilateral financial institutions and bilateral development agencies), in an attempt to solve the failure of official public water utilities, have facilitated the commercialization of public water utilities; this is often known as privatization or private sector participation (Budds & McGranahan, 2003). However, several studies conducted to assess performance of some of these large scale private companies report that for a range of reasons, there is little or inadequate evidence of improvement in water supply under private sector participation (Gutierrez *et al.*, 2003; Budds & McGranahan, 2003; Davis, 2005; Anand, 2006; Bakker, 2007). Thus a large number of people remain without access to sufficient safe water despite presence of the large scale official public and private water utilities. Poor water supply has profound and inter-linked health and socio-economic effects (Howard, 2001; Anand, 2006; UN- Habitat, 2008). There is therefore an increasing acknowledgement that the current "official" methods have not worked for all, and that more flexible approaches may be necessary for water provision (Bakker, 2007). Some attention is being directed at investigating how populations un-served or inadequately served by official water utilities are meeting their water needs and what opportunities may exist for further improvement (Solo, 1999; Collignon & Vezina, 2000). This research seeks to contribute to this emerging investigation.

The inability of official large-scale public and private water utilities to meet the water needs of millions of people in urban areas of developing countries has resulted in the emergence of other suppliers. Such suppliers exist in many countries and are known by various names. Referred to here as Independent and Small- Scale Water Providers (I&SSWPs), they are also known as informal water providers; water vendors; small-scale independent providers; small scale water enterprises/providers; mini-utilities; non-state water providers; or "the other private sector". They provide water services supplementary or alternative to those provided by the official large scale water utilities whether public and/or private.

Studies suggest that half or more of the population in urban centres of some developing countries depend on I&SSWPs rather than the official water utilities, and further that I&SSWPs may also be growing faster (Solo, 1998; Davis, 2005). According to several studies, they may hold 50 to 80 percent of the domestic water supply market in many urban

areas of developing countries (Solo, 1999; Whittington *et al.*, 1999; Collignon & Vezina, 2000). It is suggested that I&SSWPs play an important role in meeting water needs, making up for the deficiencies of the large concessionaires and thus providing a useful service for millions of people. I&SSWPs may sometimes supplement the unreliable water provided by the official utilities to those connected, but in some areas they may be the *sole* water providers for millions of urban people not served by the official network or who live within the official network area but remain unconnected. For a variety of reasons, some urban populations in developing countries are unable to connect and access water provided by large-scale official utilities even when piped water network is available within their reach (Lawrence *et al.*, 2002; Barbara, 2007). Samson *et al.* (2003) suggests that water provision by I&SSWPs is also important because it creates employment and generates income for those involved; hence, it is a means of livelihood and important in poverty alleviation.

Nevertheless, for a long time the role played by I&SSWPs has often either been ignored or is misunderstood and described negatively (Whittington *et al.* 1991; Laurie & Marvin, 1999; Nickson, 2001; The World Bank, 2002; WHO, 2004; UNDP, 2006). I&SSWPs are generally described as offering services of variable quality. Firstly, I&SSWPs are described as providing water of questionable quality (Marvin & Laurie, 1999; Nickson, 2001). According to World Health Organization, I&SSWPs may provide water that may be inadequately treated or transport the water in inappropriate containers which has the potential of contamination. Households dependent on some of the independent water providers for their water supply are therefore categorised as not having reasonable access to safe drinking water (WHO, 2004). Solo, (1999) reports that some I&SSWPs may provide water at higher prices and therefore those who rely on I&SSWPs tend to pay more. However, because majority of those who rely on I&SSWPs are poor, hence it is the poor households who pay high prices, not only per unit cost but higher in terms of affordability (Whittington *et al.* 1991; Laurie & Marvin, 1999; The World Bank, 2002; UNDP, 2006). Marvin and Laurie (1999) further suggests that people without access to a formal water supply network usually buy water from private vendors and are also faced with more interruptions implying that those who rely on water supply from I&SSWPs suffer from unreliability or irregularity in supply and its associated problems. They further observe that those using water from the informal sector (I&SSWPs) therefore generally suffer substantial economic, health, social and environmental costs of low quality, expensive and uncertain water supply.

Innovative approaches are needed that will promote and maximise the contribution of all players including, where appropriate, I&SSWPs, which in the literature are suggested as reaching the population un-served or inadequately served by official water utilities. Hence there is a significant gap between water sector policy and actual practices on the ground. However, when the role played by I&SSWPs is better understood, problematic aspects of their service provision can be identified and minimised, and any benefits provided maximised to the advantage of the consumers.

This research was conducted in Kisumu Kenya and Addis Ababa in Ethiopia as part of a larger project (F/00 242/F), funded by the Levehulme Trust, with the overall objective of establishment of legal frameworks for independent water providers. The two study sites were chosen based on their different legal systems. However, as further shown below under background to the case study areas, there are water supply gaps not met by the official water utilities in both case studies that are expected to be met by I&SSWPs thus making them suitable area for the study to examine water supply by I&SSWPs and the need to integrate them into the formal water supply as a means of improving water provision. While this research focuses on two contrasting case studies, Kisumu in Kenya and Addis Ababa in Ethiopia, the findings, should be broadly applicable to other countries in which I&SSWPs play a significant role in the water sector. Furthermore ongoing debates and research on water provision have mainly concentrated on the role of public utilities and large-scale privatisation to the exclusion of I&SSWPs. This research, by explicitly focusing on the role of I&SSWPs will contribute to balancing and expanding this debate.

## ***1.2 Background on the case study areas***

As already mentioned in section 1.1, two case study areas were used as the focus for this research, Kisumu in Kenya and Addis Ababa in Ethiopia.

### ***1.2.1 Kisumu - Kenya***

The city of Kisumu is located on the eastern shores of Lake Victoria at the tip of Winam Gulf in the western part of Kenya (Fig.1.1) at an altitude of about 1300 meters above sea level. It covers an area of about 40,000 hectares and is the third largest city in Kenya. The climate shows comparatively small seasonal temperature variations, and is generally hot and humid. Average rainfall is between 1200 and 1400 mm per year, received in two rainy

seasons, with the major rains occurring between March and May and a shorter rainy season around November.

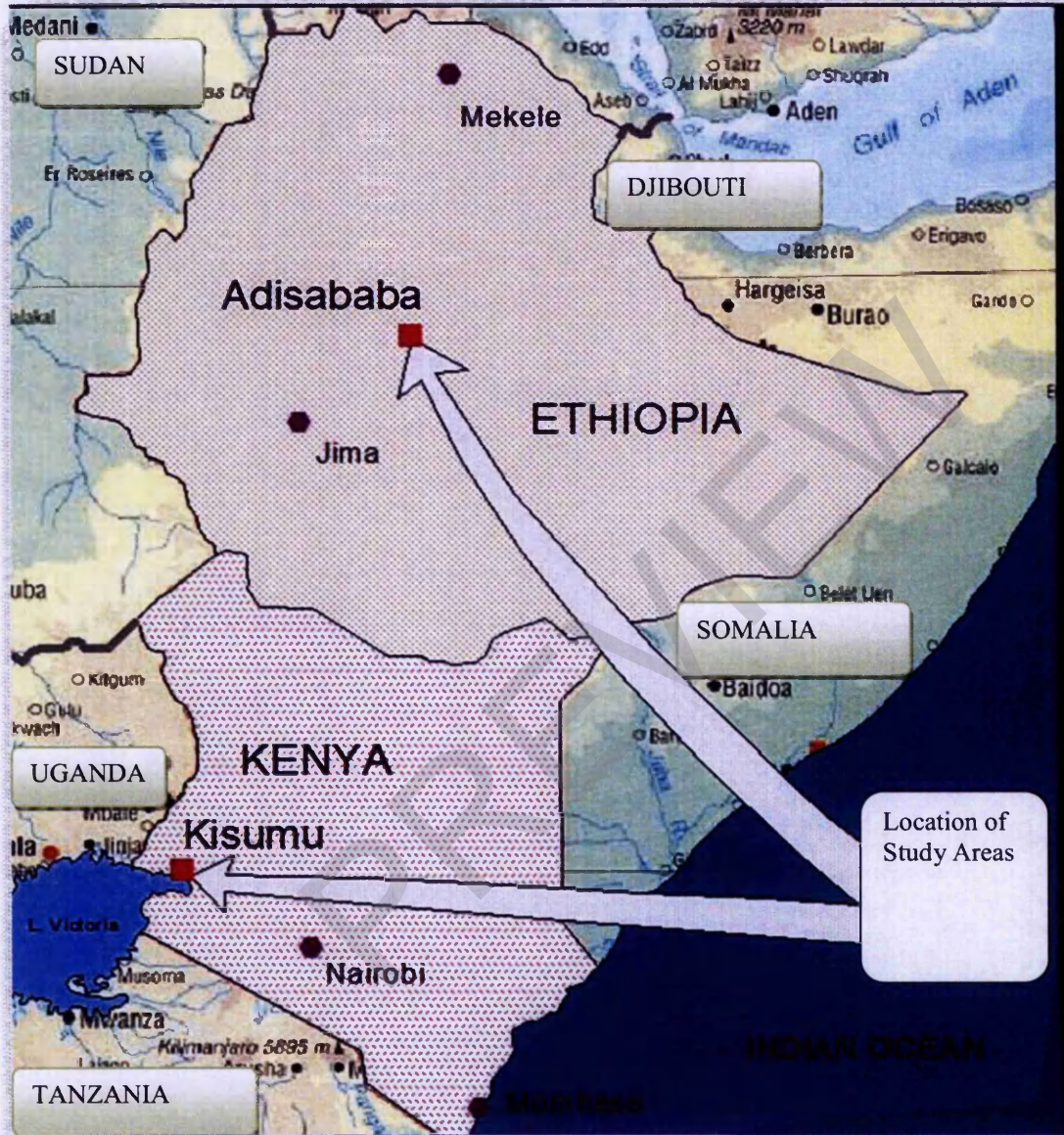


Figure 1.1 Map showing the locations of Kisumu and Addis Ababa  
Source: Base map- Modified from Asanya (2007)

The population of Kisumu like those of other cities in developing countries, has grown tremendously from only 400 inhabitants in 1910 (Anyumba 1995) to 50,000 in 1969 and 349,000 in 1999 with a growth rate of 2.6% as per the 1999 national census (CBS, 1999). The 2006 population is estimated at between 500,000 and 650,000 (UN-Habitat 2004). This rapid population increase is attributed to migration, natural increase and the expansion of the municipal boundaries to include peri-urban areas, expanding the municipal area from 19 km<sup>2</sup> in 1969 to 297 km<sup>2</sup> at present. The town has a mixed economy with only a few industries; agriculture and fishing are the major economic activities. The informal service sector is growing rapidly, but without a proper industrial base, employment opportunities are scarce and unemployment levels high.

#### **1.2.1.1 Water provision in Kisumu: the water supply context**

Water provision in Kisumu, as in other urban centres in Kenya, was for along time under the control of the Department of Water and Sewerage within the Kisumu City Council. Under the old arrangement, the domestic water supply was undertaken by the public and local authorities, as well as persons or bodies appointed as water providers by the then Minister for Water Development after consultation with the Water Resources Authority. Until the beginning of the ongoing reforms, the largest water providers were the Ministry of Water Development and the National Water Conservation and Pipeline Corporation (NWCP). In addition, some municipalities also undertook water provision. By the year 2000, there were ten municipalities licensed to provide water services, among them Kisumu Municipality, through its Water and Sewerage Department. Together the municipal water suppliers in Kenya served about 3.9 million urban dwellers (Ngingi & Macharia, 2006).

For municipalities that were not directly providing water, the NWCP was responsible for the provision of water services. But the NWCP also provided bulk water to some municipalities undertaking provision, who in turn supplied their customers. Recently, however, following ongoing major countrywide water sector reforms ushered by Sessional Paper No. 1 of 1999 and the subsequent Water Act of 2002, (GOK, 1999; 2002), the Kisumu Water and Sewerage Company (KIWASCO) was established in 2001 by Kisumu City Council from the previous Water and Sewerage Department and became operational in 2003. KIWASCO is licensed by the Lake Victoria South Water Service Board (LVSWSB) to

provide water. Under the new national arrangement Kenya is divided into seven Water Services Boards (WSBs) as shown in Table 1.1 and Figure 1.2.

**Table 1.1 The seven Waters Service Boards in Kenya, number of districts each covers, and area and population each serves**

Name of WSB	No. of Districts	Area Km <sup>2</sup>	1999 Population
Coast	7	82,816	2, 487, 000
Nairobi	6	40, 130	5, 617, 000
Central	13	52, 777	5, 032, 000
Rift Valley	8	113, 771	2, 999, 000
Northern	9	244, 864	1, 703, 000
Lake Victoria North	11	16, 977	5, 135, 000
Lake Victoria South <sup>1</sup>	16	20, 340	5, 730, 000
Total	70	571, 675	28, 703,000

Source: WSREB (2008)

Each WSB owns the corresponding water supply system and is also a licensee with respect to the supply of water services within its area of jurisdiction. Kisumu City falls within the area of jurisdiction of LVSWSB. WSB are the legal owners of water and sewerage supply assets within their areas of jurisdiction and therefore has the mandate to plan, develop and expand water and sewerage services. However, the Water Act 2002 prohibits these bodies from being directly involved in the *operation* of the system, and allows a WSB board to take the responsibility for the provision of services through signing of Service Provision Agreements with Water Service Providers (WSPs). Hence WSPs supply water on behalf of a WSB, enabling the WSB to fulfil its mandate. The Water Act of 2002 thus allows delegation of water provision but it is the WSB that decides whether to provide water services directly or indirectly through an agent. Consequently, KIWASCO is a water service provider licensed by LVSWSB to provide water to Kisumu residents on its behalf. The company (KIWASCO) is almost wholly (99%) owned by Kisumu City Council within whose local boundary it operates. The Act, however, does not state whether a WSB can licence more than one water service provider to serve the same area.

### **1.2.2.2 Availability of piped water supply in Kisumu as a whole**

The official water supply system within Kisumu consists of the official supply system (i.e. tap water) and independent sources. The official water supply has two sources supplying a total of 16,900m<sup>3</sup>/day: firstly the Kibos River through the Kajulu Waterworks with a

<sup>1</sup> Indicates the water service board within whose jurisdiction Kisumu is found

capacity of 1,800m<sup>3</sup>/day and secondly the Lake Victoria system with a capacity of 15,100m<sup>3</sup>/day by 1998.

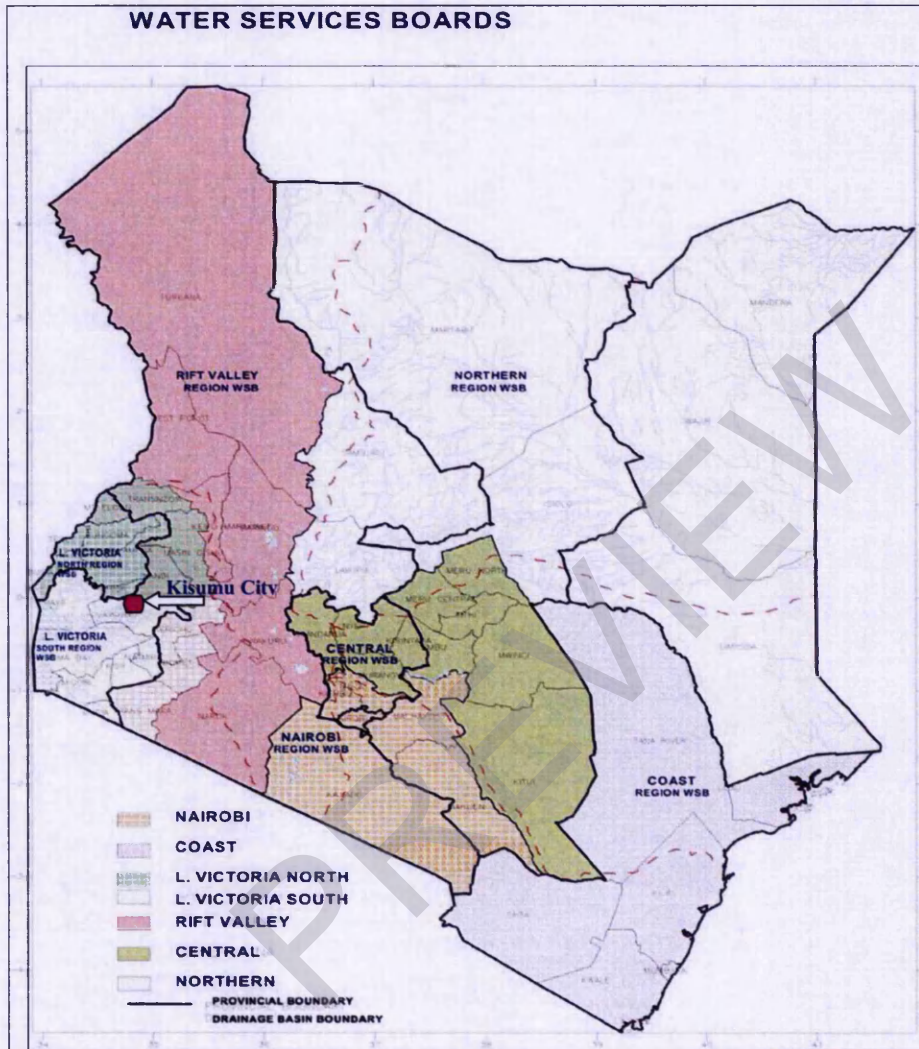


Figure 1.2 The seven water services boards in Kenya

Source: WASREB (2008)