



# Small Independent Water Providers: Their Position in the Regulatory Framework for the Supply of Water in Kenya and Ethiopia

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## ABSTRACT

The Millennium Development Goals (MDGs) included a target to halve the proportion of people without sustainable access to safe drinking water by 2015—a right recognised as fundamental to human needs. Small independent water vendors are often the only water supply option in peri-urban neighbourhoods in developing countries and fill a critical gap in the municipal system, but there is concern about the quality and price of their water. Such vendors need to be recognised and regulated due to their role in meeting basic water needs. This article reflects on the lack of regulation and discusses a recent multidisciplinary research project in Kenya and Ethiopia that considered whether there is a case for regulation of competition, price and quality. It concludes that recognising small independent water vendors as part of a regulatory framework will result in increased access to water for the poor and assist in the realisation of the MDGs, the right to water and intergenerational equity.

**KEYWORDS:** water vendors, water quality regulation, Millennium Development Goals, right to water, Kenya, Ethiopia

## 1. INTRODUCTION

Deprivations in water and sanitation lie at the core of poverty:

Some 1.8 million child deaths each year as a result of diarrhoea... Together, unclean water and poor sanitation are the world's second biggest killer of children. Deaths from diarrhoea in 2004 were some six times greater than the average annual deaths in armed conflict for the 1990s. The loss of 443 million school days each year from water-related illnesses... Close to half of all people in developing countries suffering at any given time from a health problem caused by water and sanitation deficits... Millions of women spending several hours a day collecting water... Lifecycles of disadvantage affecting millions of people, with illness and lost educational opportunities in childhood leading to poverty in adulthood...<sup>1</sup>

The human cost of lack of access to safe drinking water and sanitation is plain to see from these raw statistics. Beyond that basic fact lie the economic impacts of such inadequate provision on gross domestic product.<sup>2</sup>

The backdrop for this article—and for the multidisciplinary research project carried out by the authors and funded by the Leverhulme Trust,<sup>3</sup> which is explained below—is the impact of the Millennium Development Goals<sup>4</sup> (MDGs) on improving the quality of life for the world's poor and vulnerable, in particular, by improving their access to safe drinking water. At the United Nations Millennium Summit in 2000, world leaders agreed on a set of goals<sup>5</sup> to be achieved by the year 2015. These followed the Millennium Declaration that was adopted as a General Assembly resolution—a non-legally binding recommendation.<sup>6</sup> In a speech in 2010, the goals were described by the UN Secretary-General as ‘... a promise—a declaration of

1 UN Development Programme, *Human Development Report 2006: Beyond Scarcity: Power, Poverty and the Global Water Crisis* (Palgrave Macmillan 2006) 6. See also the UN Development Programme, *Human Development Report 2011, Sustainability and Equity: A Better Future for All* (Palgrave Macmillan 2011), which demonstrates the continuing link between dirty water and inequality; and WHO/UNICEF, *Global Water Supply and Sanitation Assessment 2000 Report* (World Health Organization and United Nations Children's Fund 2000) 2–3.

2 The economic impact in Sub-Saharan Africa is estimated to be a loss of about 5% of GDP—an amount that exceeded total aid and debt relief in 2003. UN Development Programme, *Human Development Report 2006* (n 1) 6.

3 ‘Regulatory Frameworks for Independent Water Providers in Kenya and Ethiopia’, Leverhulme Trust (Grant participants: University of Surrey, UK; Grant number: F00242F).

4 UNICEF, *Water, Sanitation and Hygiene Annual Report 2009* (UNICEF WASH Section Programmes 2010).

5 As announced by the UN Secretary General in his report to the 61st General Assembly in 2006. For further details of the Millennium Development Goals, see <[www.un.org/millenniumgoals/bkgd.shtml](http://www.un.org/millenniumgoals/bkgd.shtml)> accessed 6 October 2013.

6 Binding decisions on all members can only be taken by the Security Council (Art 25, UN Charter); and see, James Crawford, *Brownlie's Principles of Public International Law* (8th edn, OUP 2012) 189. For a discussion on whether the MDGs now form customary international law see: Gobind Nankani, John Page and Lindsay Judge, ‘Human Rights and Poverty Reduction Strategies: Moving Towards Convergence?’ in Philip Alston and Mary Robinson (eds), *Human Rights and Development, Towards Mutual Reinforcement* (OUP 2005) 475–98; and Marie von Engelhardt, ‘The Millennium Development Goals and Human Rights at 2010 – An Account of the Millennium Summit Outcome’ (2010) 2 *Goettingen J Intl L* 1129.

collective responsibility for the world's poor and vulnerable, a pledge to build decent, healthier lives for billions of people'.<sup>7</sup> The MDGs are a set of eight goals consisting of 32 target indicators that represent 'progress on a range of economic and social indicators'.<sup>8</sup> These goals motivate and mobilise development efforts and are a means of measuring the performance of countries. As part of the development agenda, the MDGs are not specifically based on human rights although the rhetoric of human rights flows through the development discourse.<sup>9</sup>

Goal 7 of the MDGs seeks to achieve environmental sustainability, and Target 7c of this goal is, by 2015, to reduce by half the proportion of people without sustainable access to safe drinking water. In response to the need to monitor international progress towards Target 7c, the World Health Organisation (WHO) and UNICEF collaborated to form the Joint Monitoring Programme (JMP), whose role it is to collect, analyse and report access data gathered from participating countries. The JMP reports progress every two years.<sup>10</sup> Target 7c is more formidable for some regions and countries. For example, sub-Saharan African countries need to reduce by half the number of people without access from 45%. This would require doubling the annual investment in water supply from the historical level of US\$15 to US\$30 billion.<sup>11</sup> The enormity of the task required in these low-income countries becomes clearer when constraining factors, such as urbanisation and general population growth, are taken into account.<sup>12</sup> It is also likely that this underestimates the true extent of the problem as these figures do not take into account wider sector management costs as well as operational activities and the maintenance costs of existing capital stocks.<sup>13</sup>

For most people in the industrialised world, access to safe drinking water means turning on a tap at home or at work and receiving unlimited quantities of clean water. But the definition of 'adequate or reasonable' access to improved water sources is at a much lower standard than that and is considered to be when at least 20 litres (the amount of water needed to satisfy metabolic, hygienic and domestic requirements) of safe water (water free from biological or chemical agents at concentration levels directly detrimental to health) per day are available within 1 kilometre of a dwelling (the distance measured from a house to a public stand post or any

7 Ban Ki-moon, 'Alpbach Speech', UN Secretary-General, Ban Ki-moon's speech to the European Forum on The International Financial Crisis and the Millennium Development Goals. (Alpbach, 4 September, UN Doc SG/SM/13087 DEV/2808, 7 September 2010).

8 William Easterly, 'How the Millennium Development Goals are Unfair to Africa' (2009) 37 *World Development* 26, 26.

9 Engelhardt (n 6); Philip Alston, 'Ships Passing in the Night: The Current State of the Human Rights and Development Debate Seen through the Lens of the Millennium Development Goals' (2005) 27 *Human Rights Q* 755.

10 See <<http://www.wssinfo.org/>> accessed 6 October 2013.

11 Aldo Baietti and Peter Raymond, 'Financing Water Supply and Sanitation Investments: Utilizing Risk Mitigation Instruments to Bridge the Financing Gap' (2005) 4 *World Bank Water Supply and Sanitation Sector Board Discussion Paper Series*, 1 <[http://ppi.worldbank.org/resources/ppi\\_other/resources.aspx?resourceId=6](http://ppi.worldbank.org/resources/ppi_other/resources.aspx?resourceId=6)> accessed 6 October 2013.

12 Richard Carter and Kerstin Danert, 'The Private Sector and Water and Sanitation Services: Policy and Poverty Issues' (2003) 15 *Journal of International Development* 1067, 1068.

13 Meera Mehta, Thomas Fugelsnes and Kameel Virjee, 'Financing the Millennium Development Goals for Water and Sanitation: What Will it Take?' (2005) 21 *Water Resources Development* 239, 240.

other improved drinking water source).<sup>14</sup> The source of the water is also critical to the definition and improved water sources include: household connection, public standpipe, borehole, protected dug well, protected spring and rainwater collection.<sup>15</sup> This represents a limited range of supplies and other sources such as vendor-provided water, tanker truck provision of water, unprotected well, unprotected spring and bottled water are not regarded as 'improved sources'.<sup>16</sup> Because of the difficulty of measuring access to safe water directly (and perhaps also because of the difficulty in defining what is meant by safety) many organisations use an indirect way of measuring safety through access to improved sources—described by the JMP as a 'proxy indicator'.<sup>17</sup> This is based on the presumption that *improved sources* are safe. So, if people get access to such sources that is considered equivalent to getting access to *safe* water. However, like any other presumption, this is not conclusive. For example, piped water is an improved source but may at times be unsafe for drinking.<sup>18</sup> It should also be noted that the definition of access to improved water sources does not measure the reliability of supply. In most developing countries, even having access to piped water in the house is not a guarantee of water security—piped water is not available '24/7'. For those in informal slum settlements without piped supplies who rely on small independent water vendors, the position is plainly far more precarious.

With respect to drinking water, in its latest report (the 2012 update report) the JMP has announced that, on the basis of this criterion of access to improved sources, the MDG target has been met.<sup>19</sup> But, the global figures for those lacking access to improved water sources are based on limited data and presumptions and it is likely that the position might be worse than the estimates. The figures are difficult to quantify and satisfaction of the MDGs remains controversial.<sup>20</sup> The figures underestimate the extent of the problem as they do not measure the reliability and quality of piped services;<sup>21</sup> real-service coverage figures are worse in some countries and for some groups of people such as low-income people in urban areas;<sup>22</sup> and, the estimates cover only 90% of the global population.<sup>23</sup>

14 WHO/UNICEF, *Global Water Supply and Sanitation Assessment 2000 Report* (WHO/UNICEF Joint Monitoring Programme for Water Supply and Sanitation, 2000) 77; UN indicators: *Proportion of Population Using Improved Water Sources* <<http://data.un.org/Data.aspx?d=MDG&f=seriesRowID%3a665>> accessed 17 February 2013. WHO, *Guidelines for Drinking-water Quality: Incorporating First and Second Addenda* (3rd edn, WHO 2008).

15 WHO/UNICEF (ibid) 77.

16 ibid.

17 WHO/ UNICEF, *Drinking Water: Equity, Safety and Sustainability: Thematic Report on Drinking Water* (Joint Monitoring Programme for Drinking Water and Sanitation 2011) 11.

18 Robert Bain and others, 'Accounting for Water Quality in Monitoring Access to Safe Drinking-Water as Part of the Millennium Development Goals: Lessons from Five Countries' (2012) 90 *Bull World Health Organization* 228; Baietti and Raymond (n 11).

19 UNICEF and the World Health Organization, *Progress on Drinking Water and Sanitation: 2012 Update* (WHO/UNICEF Joint Monitoring Programme for Water Supply and Sanitation 2012).

20 Bain and others (n 18).

21 Baietti and Raymond (n 11) 1.

22 Jessica Budds and Gordon McGranahan, 'Are the Debates on Water Privatization Missing the Point? Experiences from Africa, Asia and Latin America' (2003) 15 *Environment and Urbanization* 87, 88; and Carter and Danert (n 12) 1068.

23 Terence Lee and Vinio Floris, 'Universal Access to Water and Sanitation: Why the Private Sector Must Participate' (2003) 27 *Natural Resources Forum* 279–80.

Poverty is linked with lack of access to a secure and safe source of water<sup>24</sup> and typifies informal settlements which, in the developing world, continue to grow with the number of slum dwellers expanding from 767 million in 2000 to 828 million in 2010.<sup>25</sup> These are concentrated in key parts of the world: in sub-Saharan Africa, where this research project was undertaken, 62% of the urban population was living in slums in 2010.<sup>26</sup> This raises questions of sustainable development and intergenerational equity<sup>27</sup> coupled with the right to water as an international and, in some cases, constitutional, human right.<sup>28</sup> The linkage between sustainable development, human rights and the development priority is plain. Individuals in Ethiopia and Kenya, the case-study countries in the research project, have a right to water based on their national constitutions;<sup>29</sup> the International Covenant on Civil and Political Rights (ICCPR);<sup>30</sup> and, the International Covenant on Economic, Social and Cultural Rights (ICESCR)<sup>31</sup> as interpreted by the Committee on Economic, Social and Cultural Rights (CESCR).<sup>32</sup> The relevant interpretations of the CESCR are contained in General Comment No. 15 on the right to water.<sup>33</sup> There are also other international human rights instruments specifically dealing with the right to water, albeit with respect to specified groups such as women and children.<sup>34</sup> But, as is evidenced by the large numbers deprived of adequate supplies of safe drinking water, a gap lies between the right as formulated in international and national laws, and the extent to which citizens are empowered to demand the fulfilment of that right in practical provision and services. Access to safe drinking water is not a personal choice and the gaps in water supply infrastructure *must* be filled in one form or another—human beings must have water to survive. The challenge to meet this need and right

24 Philippe Cullet, *Water Law, Poverty, and Development: Water Sector Reforms in India* (OUP 2009) 10.

25 United Nations, *Millennium Development Goals Report 2010* (UN Department of Economic and Social Affairs 2010).

26 *ibid.*

27 World Commission on Environment and Development, *Our Common Future* (OUP 1987) 43.

28 The right to water appears in a number of constitutions. See, for example, Article 43(1)(d) of the Constitution of Kenya (Revised edition: 2010, National Council of Law Reporting, Kenya, 2010): 'every person has the right to clean and safe water in adequate quantities'; and, the Constitution of the Federal Republic of Ethiopia, 1994, Proclamation No 1/1995, Article 90: 'To the extent the country's resources permit, policies shall aim to provide all Ethiopians access to public health and education, clean water, housing, food and social security'.

29 *ibid.*

30 International Covenant on Civil and Political Rights (ICCPR) (adopted 16 December 1966, entered into force 23 March 1976) 999 UNTS 171.

31 International Covenant on Economic, Social and Cultural Rights (ICESCR) (adopted 16 December 1966, entered into force 3 January 1976) 993 UNTS 3.

32 Salman MA Salman and Siobhan McInerney-Lankford, 'The Human Right to Water: Legal and Policy Dimensions' (Law, Justice, and Development Series, The World Bank 2004).

33 Committee on Economic, Social, and Cultural Rights (which monitors the interpretations of the International Covenant on Economic, Political and Social Rights), General Comment No. 15: The Right to Water' (Articles 11 and 12 of the International Covenant on Economic, Social and Cultural Rights), UN Doc E/C 12/2002/11 (2003).

34 See Convention on the Elimination of All Forms of Discrimination against Women (CEDAW) (adopted on 18 December 1979, entered into force on 3 September 1981) 1249 UNTS 13 and Convention on the Rights of the Child (adopted on 20 November 1989, entered into force on 2 September 1990) 1577 UNTS 3 (CRC). Whether the right to water is a derivative or stand-alone right is debatable. See Eric Bluemel, 'The Implications of Formulating a Human Right to Water' (2004) 31 Ecology LQ 957, 963.

of the slum dwellers to improve the supply of water as posed by the MDGs, encompasses not just engineering solutions, but also consideration of the structure for the water industry together with its regulation. In developing countries, municipal piped systems neither reach all the population nor provide secure access to those they do reach. In practice, in developing countries, the gaps in infrastructure are filled by small independent water providers (SIPs) who operate at the periphery of the formal municipal systems.<sup>35</sup> The epitome of micro and small enterprises, they provide an essential stopgap. But, they are usually viewed as just that—stopgaps until municipal systems catch up. Frequently viewed as undesirable with a precarious position in the hierarchy of water supply, they tend not to be recognised by law or operate illegally. Operating outside regulatory frameworks, they are consequently vulnerable to enforcement action leading to closure; lack of investment and property opportunities; and, lack of opportunities for education in public health requirements and good practice concerning safe water. Yet, their position in the water supply hierarchy is critical to the fulfilment of the right to water. It is reported that these providers are not accorded the recognition and support that is given to official providers; that they charge higher prices than the official providers; and, that the quality of water is very poor.<sup>36</sup> Legal frameworks rarely exist for regulating competition, price and quality of water provided by SIPs. However, at a minimum, according to the CESCR the human right to water requires the government to establish a regulatory framework that has the objective, among others, of ensuring that water services provided by third parties such as SIPs are safe and affordable.<sup>37</sup> Therefore, the right to water arguably requires all governments in developing countries where SIPs operate to set up and enforce a legal framework for their regulation.

In the research project carried out by the authors,<sup>38</sup> the formal integration of SIPs in developing countries into technical, policy and legal frameworks as a means of increasing access to safe and affordable drinking water (and thereby improving the chances of achieving the MDG target and giving effect to their human right) was investigated. Given the importance of SIPs in providing a supply of water which generally improves access, the research project set out to investigate their position in the regulatory frameworks in two case-study areas and to enquire as to whether the current approach to SIPs was antipathetic to the achievement of the MDGs' objective of improving access to safe water together with fulfilment of the human right. We first

35 See eg Gordon McGranahan and others, 'How Small Water Enterprises Can Contribute to the Millennium Development Goals: Evidence from Dar es Salaam, Nairobi, Khartoum and Accra' (Series: Small Water Enterprises, Water, Engineering and Development Centre (WEDC), Loughborough University, UK 2006); Suzanne Snell, 'Water and Sanitation Services for the Urban Poor: Small-Scale Providers Typology and Profiles' (UNDP-World Bank Water & Sanitation Program 1998); Tova Maria Solo, 'Small-scale Entrepreneurs in the Urban Water and Sanitation Market' (1999) 11 *Environment and Urbanization* 117; Water and Sanitation Program (WSP)—East Asia and the Pacific, 'The Experience of Small-Scale Water Providers in Serving the Poor in Metro Manila' (Field Note, WSP, 2004); and Adriana Allen, Julio D Dávina and Pascale Hofmann, 'The Peri-Urban Water Poor: Citizens or Consumers?' (2006) 18 *Environment and Urbanization* 333; Esther Gerlach and Richard Franceys, 'Regulating Water Services for the Poor: the Case of Amman' (2009) 40 *Geoforum* 431.

36 McGranahan and others (*ibid*).

37 Committee on Economic, Social, and Cultural Rights, General Comment No 15 (n 33) Art 24.

38 (n 3).



consider the role of SIPs in achieving Target 7c of the goals, and then report on the research project which examined the role of SIPs in two African cities and analyse the rationale and importance of bringing SIPs within regulatory frameworks to increase access to safe water.

## 2. SMALL INDEPENDENT WATER PROVIDERS

SIPs comprise a variety of different types of vendors. The patterns of business models examined in the two contrasting case-study areas in the research project aptly exemplify the varieties of SIPs operating worldwide and are explained here as a working demonstration of the concept. For example, in Kisumu, Kenya, standpipe operators are connected to the official water supply network and operate under contract with the supplier, selling water from water kiosks at a flat-rate tariff. Other vendors resell water from the official network to which they are connected and operate without contracts. They do not, therefore, benefit from the flat rate charged by the official supplier. Standpipe operators may sell directly to the consumer, or to mobile water vendors who deliver water to the households. In some instances, contracted standpipe operators are entering into delegated management models with the official utility, the Kisumu Water and Sewerage Company (KIWASCO), under which they take responsibility for extending the piped water network. Well and borehole operators dig wells or sink boreholes and sell directly to consumers and to mobile water vendors. They do not have contracts with KIWASCO and are usually operating at a micro scale with many owners operating single or a small number of wells that they have dug on their own land. So this water is not coming from a municipal supply and is very likely to show high levels of contamination and not be suitable for drinking (see Table 2 later). In Kisumu, there is also a single mini-utility that is abstracting water from Nyamasaria River to a treatment plant and then selling it to consumers and mobile water vendors. This facility operates under permit from the Water Resources Management Authority (WRMA) and asserts the existence of an agreement with the Lake Victoria South Water Services Board (LVSWSB) to supply water until KIWASCO extends its water supply infrastructure. Mobile water vendors include handcart pushers and tanker trucks. They purchase water from all sources and move it round the city in search of customers. The duty to monitor water rests with KIWASCO. Plainly, this duty will not be fulfilled in relation to the numerous SIPs operating illegally.

In Addis Ababa, SIPs do not operate in the same way as in Kisumu as they all rely on the official water providers for bulk water supply. The supervision of the water supply falls to the official provider—the Addis Ababa Water and Sewerage Authority (AAWSA). One form of SIPs are called ‘public fountains’, which are *kebele*<sup>39</sup>-managed communal water collection points operated by individuals employed by local administrators. Another form of SIPs is owned and operated by community groups who pool their resources to get a public standpipe. Most common are neighbour sellers and water kiosks that have no special relationship with the AAWSA and are often to be found in grocery shops. They are reselling the water they receive through their own private connection. Mobile water vendors transport water by

39 The *kebele* is a controlling group in the local community.

donkey or car. These, together with the water kiosks and neighbour sellers, are operating in violation of the law as they have no permits from AAWSA.

So, SIPs include standpipe operators (either officially recognised or not), who purchase water from the official water utility and then resell this water either directly to consumers or to mobile vendors; well and borehole operators selling either directly to consumers or to mobile vendors; and, the mobile vendors who purchase water from the standpipes and wells to resell to consumers. These types of SIPs are common throughout the developing world in the countries primarily targeted by the MDGs.

SIPs perform a vital role in that, for most people living in towns in developing countries, their domestic water supply is dominated not by the official water utilities but by SIPs.<sup>40</sup> There is a stark contrast in provision between industrialised countries, where water mainly comes through the tap from highly regulated water treatment plants and these poor urban areas, where water comes from mixed sources. Many households may have connections to municipal supplies but even there, discontinuity of supply frequently means that the householder must seek alternative or supplementary supplies and this usually means reliance on SIPs. For informal peri-urban settlements, connections are less usual and there they depend almost entirely on SIPs. As described above, these vendors obtain their water supply from a mixture of sources—some improved and some unimproved—but for many, SIPs complete the cycle of water supply creating a virtual piped network. Yet their critical role in bringing drinking water to the un-served majority is rarely acknowledged by authorities. For instance, according to the JMP,<sup>41</sup> water supplied by SIPs is not considered an improved water source, partly because of the lack of regulatory frameworks in most countries to ensure the safety and supply of water, but also due to its lack of affordability.<sup>42</sup> A 2002 World Bank report stated that in cities ‘in the developing world the un-served poor pay ten or more times the price for a liter of water than is paid by their fellow citizens who are served with formal supplies’.<sup>43</sup> The Asian Development Bank<sup>44</sup> noted that Asia’s urban poor using SIPs pay 20–40 times more per litre than water consumers with a municipal connection. UNICEF states that in urban slums many people are forced to pay exorbitant prices to SIPs for inadequate quantities of water that are often contaminated.<sup>45</sup> These vendors, however, are often the *only* water supply option in many poor and peri-urban neighbourhoods, as well as

40 Bernard Collignon and Mark Vezina, ‘Independent Water and Sanitation Providers in African Cities, Full Report of a 10 Country Study’ (UNDP/World Bank Water and Sanitation Program 2000); Marianne Kjellen, ‘Complementary Water Systems in Dar-es-Salaam, Tanzania: the Case of Water Vending’ (2000) 16 *Intl J of Water Resources Development* 143; Veena Srinivasan, Steven M Gorelick and Lawrence Goulder, ‘Sustainable Urban Water Supply in South India: Desalination, Efficiency Improvement, or Rainwater Harvesting?’ (2010) 46 *Water Resources Research* W10504.

41 WHO/UNICEF Joint Monitoring Programme for Water Supply and Sanitation (n 14).

42 *ibid.*

43 The World Bank, *Water Resources Sector Strategy: Strategic Directions for World Bank Engagement* (International Bank for Reconstruction and Development/World Bank 2004).

44 Asian Development Bank, ‘Should Asia’s Urban Poor Pay for Water?’ In *Water For All Water Briefs* (2006) <<http://www.adb.org/sites/default/files/pub/2006/water-brief-should-poor-pay.pdf>> accessed 10 July 2013.

45 UNICEF, *Water, Sanitation and Hygiene Annual Report 2009* (UNICEF Wash Section 2010).



providing supplementary water to middle-income households when services provided by the official utility are inadequate or fail. It is clear that the existence of SIPs results from a failure by the official utility suppliers to provide an adequate supply. These vendors, by filling this gap, are providing an essential service.

Despite this significant role played by SIPs, in many countries they operate illegally either because they sell water where trading is prohibited, or because they operate below the quantitative limits prescribed by regulation. Whether they are operating legally or otherwise, the regulations are generally not effectively enforced so as to achieve affordable water of an adequate and consistent standard. There are a number of reasons why SIPs fail to gain recognition within the legal systems, but their existence may well be a consequence of an underlying malaise in the utilities that could be resolved by investment and capacity building<sup>46</sup> with the right political will and social infrastructure. For the time being, this political will is not apparent and while that situation remains, SIPs will continue to operate with or without legal recognition. Whatever the reason for this lack of legal recognition, it generally results in SIPs remaining outside formal regulatory frameworks controlling quality and price, as well as discouraging investment due to the lack of investment security.<sup>47</sup> Such lack of controls leave SIPs vulnerable to the very real accusation that the water they supply is of poor and/or inconsistent quality and is exorbitantly priced.

It is necessary to examine the role played by SIPs in meeting the water supply needs of residents of peri-urban and poor urban districts before assessing how these vendors can be effectively regulated given the limitations of regulatory authorities. The challenge of regulation is to provide effective protection for the consumer while, at the same time, not prematurely discouraging SIPs from pursuing their business. While SIPs may not, in the opinion of some, be the ideal water source for most households (and given the choice and ability to pay, most households would opt for a piped water supply) optimising the services provided by SIPs is still critically important. It may also be arguable that their existence needs to be regulated to enhance their long-term position in the hierarchy of water supply. It is likely that the current social and political structures will continue in the foreseeable future in many developing countries, thus precluding the extension and reliability of municipal infrastructural development. Households using the services of these vendors do not generally have a choice and thus while extending and improving the affordability of municipal supply systems should remain a medium to long-term goal, improving regulation to ensure improved water safety and affordability from SIPs is still an immediate priority and an urgent matter for public health concerns. Reducing the disease burden of this segment of society is an important potential benefit of regulation that may be achievable at relatively minimal cost. In seeking to continue to improve upon Target 7c of the MDGs, it is important to bring into the forefront the role played by these vendors.

46 David Schaub-Jones, 'Market-based Approaches in Water and Sanitation: The Role of Entrepreneurship' (2011) 30 *Waterlines* 5.

47 Collignon and Vézina (n 40).

### 3. THE RESEARCH PROJECT: KISUMU, KENYA AND ADDIS ABABA, ETHIOPIA

The role played by SIPs and regulatory options for these water suppliers was explored by focusing upon the two case studies chosen for the research project: Kisumu, Kenya and Addis Ababa, Ethiopia. By mapping out the legal frameworks for the regulation of SIPs in Ethiopia and Kenya, the research determined the extent to which their activity is regulated by the state. The research also aimed to find out if there is any case for regulation of competition among SIPs and the price and quality of water they are providing. Finally, one of the objectives was to make a critical analysis of the way they are currently regulated and to consider whether regulating SIPs was desirable in support of the achievement of the relevant MDGs in improving access to safe water and in operationalising the right to water.

Kisumu and Addis Ababa are two examples of African cities that show how difficult it can be to assess progress towards achieving the MDGs in sub-Saharan Africa. Many households in these cities use multiple sources of water depending upon availability, distance and cost. While the preference for the householder is bound to be to take water from their own private connection, frequent failures in supply mean that that is not always a choice that can be made. Using the standpipe may be a necessity, with SIPs providing an essential stopgap service completing the cycle of water availability at all times.

Kisumu, Kenya is located on the shore of Lake Victoria and has an estimated population of more than 500,000. KIWASCO is wholly owned by the Kisumu municipality and is contracted to provide water and sewerage services in the city. KIWASCO's network is estimated to supply just under one half of Kisumu's population via 17,651 connections.<sup>48</sup> Hence, SIPs of various types play a critical role in meeting the majority of water needs across the city.

Addis Ababa, located in the central highlands of Ethiopia, has an estimated population of more than three million. AAWSA, an autonomous government body, is charged with providing water and sewage services for the city. While some 97% of the city's population has some form of access to piped water,<sup>49</sup> only a minority of residents have private water connections. Many residents therefore rely upon shared taps, buying water from neighbours who resell their water illegally, or standpipe operators, who may be officially recognised by the water authority and legal, or not officially recognised and thus illegal. With rapid expansion of the city, newly settled areas are poorly served with long cut-offs to the piped water supply being common.

These two case studies were chosen for two reasons. First, Ethiopia and Kenya differ significantly in their political and legal systems, thus providing contrasting case studies. Ethiopia is a country influenced by a mixed continental legal tradition, whereas Kenya is largely influenced by the British common-law tradition. Ethiopia's constitution envisages a federal ethnic-based parliamentary democracy, whereas

48 Water Services Regulatory Board. *Impact: A Performance Report of Kenya's Water Services Sector* (Water Services Regulatory Board 2012) <<http://www.wasreb.go.ke/>> accessed 10 July 2013.

49 UN-Habitat for a Better Urban Future, *Addis Ababa City Programme* <<http://www.unhabitat.org/content.asp?typeid=19&catid=499&cid=3207>> accessed 10 July 2013.

Kenya's envisages a unitary presidential democracy.<sup>50</sup> Secondly, Kisumu and Addis Ababa differ markedly in the structure of their water sectors and the operation of their SIPs. In Addis Ababa, the water authority is part of the municipality and while 97% of the water supplied in the city can ultimately be traced back to the municipal supply system, a much lower proportion of the population has direct access to the municipal system compared to Kisumu. In Kisumu, the KIWASCO is a public company owned by the municipality, and while 60% of the water consumed in the city can be traced back to this company, only 40% of households have a direct connection to the company's network.<sup>51</sup> Approximately 40% of the water in the city comes from sources independent of the water company. These differences between the two cities provide a basis for investigating the position of SIPs in each city, the role they play and the extent to which their position could be usefully brought within regulatory frameworks in any urban or peri-urban context. Thus, this study provided valuable lessons for the supply of water in such environments.

#### 4. RESEARCH METHODOLOGY

This was a multidisciplinary project with investigations taking place in relation to water quality, the price of water; the socio-economic status of the householders; and, the regulatory frameworks for the legal status of SIPs and the enforcement context.

Initially, consultations and discussions in Addis Ababa and Kisumu were carried out with representatives of the official water authorities and other stakeholders to establish which areas of each city met the criteria of being poorly served or un-served by the official water authority and were hence suitable as case studies to explore the role played by SIPs. A two-level stratification was used in order to determine the availability of drinking water defined by social groups. Water availability defined the first level of stratification and socio-economic status the second level. Lists of possible target areas were generated and then reconnaissance surveys were carried out to identify areas that were poorly served by piped water systems with significant use of SIPs.<sup>52</sup> In Kisumu, due to the large number of potential sites identified based upon the quality of their piped water supply service, two poor and two non-poor neighbourhoods based upon income levels were selected using Kenyan Central Bureau of Statistics census data. The Central Bureau of Statistics stratifies urban areas in Kenya into five categories of living standards: upper, lower upper, middle, lower middle and low, with the last two of these categories used to define poor neighbourhoods and the other three categories used to define non-poor neighbourhoods in this study.

Unlike Kisumu, Addis Ababa has predominantly mixed development where poor and non-poor live cheek by jowl as a result of the city's history and general lack of urban planning. Based on the list of potential neighbourhoods identified as having been poorly served by the piped water-supply service or having less than 20% of households with a direct tap connection, a random sample of five neighbourhoods

50 WJ Kamba, 'Comparative Law: A Theoretical Framework' (1974) 23 ICLQ 485, 511-512; AJ Ogus, 'Competition Between National Legal Systems: A Contribution of Economic Analysis to Comparative Law' (1999) 48 ICLQ 405.

51 Water Sources Regulatory Board (n 48).

52 Vic Barnett, *Sample Survey Principles and Methods* (Wiley 2003).

was selected as case-study areas.<sup>53</sup> All of these were mixed neighbourhoods, but three were predominantly poor and two were predominantly non-poor.

The multidisciplinary study broadly had two elements: a water usage study identifying sources and quality of water and the socio-legal analysis of the regulatory framework and enforcement of quality standards and price. Over a two-year period between 2008 and 2010, the water usage study was conducted in the selected case-study areas involving semi-structured interviews, a household survey, focus group discussions,<sup>54</sup> sanitary inspections, and the monitoring of water quality.<sup>55</sup> In Kisumu, the household survey was conducted in English or Swahili. Specific targeted households within the case-study areas were selected using a systematic random sampling procedure.<sup>56</sup> In Addis Ababa, the survey was conducted in Amharic. There was some difficulty finding willing participants in Addis Ababa due to fear by some people that participation could lead to problems—given the illegal nature of some of the water reselling activities—and hence endanger the means the household used to obtain water. Therefore, starting from a randomly selected sampling point in the case-study area a referral, or ‘snow ball’, sampling procedure was followed whereby a respondent who agreed to participate in the study would in turn help to introduce the researchers to other potential respondents who they thought might also be willing to participate in the study.<sup>57</sup>

In total, 310 households were surveyed. Households were asked about the sources of the water they used and water samples were taken for analysis. Thermotolerant coliforms (TTCs) were used as indicators of the microbiological water quality as the presence of these microorganisms can be an indicator that the water has been in contact with human or animal faeces. Water samples were collected in sterile containers and stored on ice for transport back to the laboratory. All analyses were carried out within 6 hours of sample collection. A portable water quality test kit (Delagua Ltd, UK) was used to process and incubate the water samples to test for TTCs.<sup>58</sup>

53 Robert Stake, *The Art of Case Study Research* (Sage Publications 1995).

54 David Morgan, *Focus Groups as Qualitative Research* (Sage Publications 1997).

55 Eighteen interviews, 310 household surveys, 3 focus group discussions and 2 stakeholders’ workshops took place. The workshops, involving around 100 stakeholders (including the Well Owners’ Association in Kisumu), government officials, regulators, water authority officials and the local mayor and other dignitaries, were held in Addis Ababa on 22 May 2009 and Kisumu on 27 May 2009.

56 Sara Arber, ‘Designing Samples’ in Nigel Gilbert (ed), *Researching Social Life* (Sage Publications 2008).

57 Gordon McGranhan, Josef Leitman and Charles Surjadi, ‘Understanding Environmental Problems in Disadvantaged Neighbourhoods: Broad Spectrum Surveys, Participatory Appraisal and Contingent Valuation. (1997) Urban Management Programme Working Paper 16, Stockholm Environment Institute, Stockholm <[www.sei-international.org/mediamanager/documents/Publications/Risk-livelihoods/understanding\\_environmental\\_probs\\_disadv\\_neighbourhoods.pdf](http://www.sei-international.org/mediamanager/documents/Publications/Risk-livelihoods/understanding_environmental_probs_disadv_neighbourhoods.pdf)> accessed 6 October 2013; Robert Chambers, ‘Participatory Rural Appraisal (PRA): Challenges, Potentials and Paradigm’ (1994) 22 *World Development* 1347.

58 Briefly, 100 ml of water was filtered through 0.45µm, 47 mm diameter membranes under vacuum. The filters were placed onto pads soaked with Membrane Lauryl Sulfate Broth (MLSB) and incubated at 44 C ± 0.5 C for 22 hours. The plates were examined within 15 minutes of being removed from the incubator and all yellow colonies of greater than 1 mm diameter were counted and recorded as TTC. Appropriate dilutions were made of heavily contaminated samples and the final result adjusted to provide the number of colony forming units per 100 ml (cfu/100 ml). No further confirmation tests were carried out on the isolates. The method was broadly based on Standing Committee of Analysts, Environment Agency, *The*

Samples of water were taken from each point of the supply chain in order to determine at which points, if any, contaminants entered the water supply. Further analysis of the supply chain focused upon the security of supply, ownership of the infrastructure, the means of supply and delivery, employment relations, and ownership of the water itself. A standardised questionnaire for each category of provider was developed to reduce interview bias. Sanitary inspections were carried out in order to identify likely hazards and risks in relation to faecal contamination to which the supplied water was exposed. The methodology employed a combination of visual assessment and interviews using questionnaires, including the systematic logging of observable faults likely to lead to the degradation of water quality as a complement to the actual water quality measurements that were taken.<sup>59</sup>

In addition to the water usage study, the second element of the multidisciplinary study was carried out involving a legal analysis.<sup>60</sup> This consisted of doctrinal and documentary research to evaluate the law in Kenya and Ethiopia with respect to water supply and SIPs in order to identify gaps, inconsistencies and ambiguities within the law.<sup>61</sup> Socio-legal analysis was also carried out to identify how laws are perceived and enforced, and thus how they affect behaviour.<sup>62</sup> This socio-legal research consisted of interviews with relevant officials and other stakeholders to reveal how written laws correspond with the law as it is applied and enforced, as well as the perceptions of these officials of the role played by water vendors. The structure of the regulatory systems was analysed to identify the enforcement mechanisms and practices. This involved interviews with the national ministries, the local councils, the water utilities and companies. The business supply chain was analysed to identify the nature and legal basis of the business relationships including ownership and contractual issues, property rights to water, licensing and permissive operational controls. This involved interviews with the stakeholders in the supply chain as well as the officials in control of the regulatory enforcement framework.

*Microbiology of Drinking-Water-Methods for the Examination of Waters and Associated Materials* (Environment Agency 2010) and followed the instructions in the Oxfam-DelAgua Water Test Kit Manual (Oxfam 2004).

- 59 Both quantitative and qualitative data were collected in relation to the two case study cities. Quantitative data were analyzed using the Statistical Package for the Social Sciences (SPSS) computer software, while other methods such as content analysis were used for the qualitative data collected. For the quantitative data, distributions were defined by the mean, median, and standard deviation as appropriate to the data that were being displayed. Statistical tests applied to the quantitative data included the Kolmogorov-Smirnov (K-S) Test with Lilliefors correction or Shapiro Wilks Test, Pearson's Chi-square Test ( $\chi^2$ ), Kurshkall Wallis Test, Wilcoxon Signed-Rank Test, Kendall's Tau Test, Mann Whitney Test, Spearman's rank ( $r^2$ ) correlation, and Friedman's ANOVA ( $\chi^2_F$ ) Test. The microbiological water quality data were non-normal and even by transforming them to log values it was determined using the K-S and Shapiro Wilks tests that these data did not follow a log normal distribution.
- 60 Mike McConville and Wing Hong Chui, *Research Methods for Law* (Edinburgh UP 2007); David Stott, *Legal Research* (2nd edn, Cavendish 1999); John W Cresswell, *Research Design: Qualitative, Quantitative and Mixed Methods Approaches* (2nd edn, Sage 2003).
- 61 Anthony Bradney, 'Law as a Parasitic Discipline' (1998) 25 JLS 71; Roger Cotterrell, *Law's Community: Legal Theory in Sociological Perspectives* (OUP 1995).
- 62 Reza Banakar and Max Travers (eds), *Theory and Method in Socio-legal Research* (Hart Publishing 2005).



## 5. RESULTS

In both case-study areas the average household size was five members (range: 1–18 household members). The overwhelming majority of respondents had at least some formal education, with 45.1% having just primary education, and 46.0% having both primary and secondary education. 3.5% had some form of post-secondary education while 5.3% had no formal education. Although non-poor areas formed part of the study, the results showed that, in fact, the majority of respondents could be considered poor since only 27.4% of households had incomes above the official recognised poverty lines of Kenya of 10,000 Kenyan Shillings (\$US150) or Ethiopia of 1075 Ethiopian Birr (\$US110). This indicated that within our own sample, poverty levels crossed the classification of poor and non-poor neighbourhoods.

In Addis Ababa, 51.4% of households used a public water tap or standpipe as their primary water source. Twenty percent obtained water from a connected neighbour or other form of household resale of water, 14.3% obtained water from a shared tap in their yard and 14.3% from an individual household connection. Thus, overwhelmingly the water used by households in Addis Ababa is sourced directly or indirectly from the municipal system.

In Kisumu, privately owned wells were the primary water source for 67.9% of households. Public water taps or standpipes were the primary water sources for 24.4% of households. A small percentage (3.8%) depended upon handcart delivered water, either sourced from a well or public water tap, and 1.3% had an individual household connection to the municipal system. The entrepreneur running a small-scale water treatment plant in the outlying suburb of Nyamasaria was the primary water source for the remaining 2.6% of households surveyed in Kisumu.

Most households surveyed reported using more than one source of water, with some using as many as five different sources, including additional sources such as rainwater during the wet season. Distance was the most common factor which determined a household's primary water source, with 64.1% of households citing this in Kisumu and 60.0% in Addis Ababa. Water quality and safety was the second most cited reason for choice of primary water supply in Kisumu (21.8%) but not a factor in Addis Ababa. Conversely, in Addis Ababa the second most cited factor for choice of primary supply (by 28.6% of households) was the fact that the source used was the only available source. This was not a factor in Kisumu where most households had multiple options available to them. Cost was the third most cited factor in both cities, with 11.5% of households in Kisumu and 11.4% of households in Addis Ababa citing this as determining the choice of their primary water supply.

In Kisumu where water sourced from both the municipal supply system and wells was available, the majority (55.9%) preferred to use water from the municipal system for drinking and cooking, with well water used by 39.9%, and rainwater or other sources by 3.6%. Well water was preferred by a slight majority (52.5%) for non-consumptive purposes. In Addis Ababa, households did not appear selective in their use of water for different purposes as ultimately almost all water is sourced from the municipal system so there was no distinction in the quality of water from the different sources.

The quantity of water used by households varied according to the time of the year, with more used during the dry season. There was significant variation between

the two cities. In Kisumu, mean daily household water consumption was 160 litres in the wet season and 180 litres in the dry season, or 32 and 36 litres per capita, respectively. In Addis Ababa, mean daily household water consumption was 80 litres in the wet season and 116 litres in the dry season, or 16 and 23.2 litres per capita, respectively.

Costs of water in Addis Ababa and Kisumu varied according to source and time of year. In both cities a household connection was the cheapest by volume, while household resale was the most expensive in Addis Ababa and handcart delivered water was the most expensive in Kisumu (Table 1).

With per capita water consumption low, the water usage study showed that total household spending on water was inevitably also low but remained very significant as a proportion of income. In Kisumu, average monthly expenditure on water was \$US7.30 in the wet season and \$US12.80 in the dry season compared to household incomes ranging from \$US45 to \$US60. In Addis Ababa average expenditure was \$US2.00 in the wet season and \$US3.00 in the dry season compared to household incomes ranging from \$US12 to \$US21. The OECD suggests that 3–5% of income is accepted internationally as affordable,<sup>63</sup> thus households are spending an excessively disproportionate amount of their income on water since spending was far above this level.

A total of 414 water samples, 318 from Kisumu and 96 from Addis Ababa, from various sources used by households, were analysed for the presence of TTCs. The results (Table 2) show that the water quality was generally better in Addis Ababa, with the wells of Kisumu having a very high failure rate in relation to the drinking water guidelines of WHO and the standards of Kenya and Ethiopia of zero detection of TTC per 100 ml sample.<sup>64</sup>

In the water usage questionnaires, households were asked whether they ever treated their water, with 74.4% in Kisumu and 26.6% in Addis Ababa indicating that they did. Chlorination was the main method used in Kisumu while boiling was the main method used in Addis Ababa. Given that 100% of samples taken from household storage containers in Kisumu and 51.9% in Addis Ababa exceeded WHO guideline values for the presence of TTC, the treatment processes households say they are practicing were not being particularly effective. No more effective is the practice in Kisumu of storing separately water from different sources in order to use just the higher quality (and supposedly safer but more expensive) tap water for consumptive purposes.

When the microbiological quality of piped water in Kisumu was examined along the supply chain it was shown that the deterioration in water quality did not occur during transportation by handcart delivery, but occurred primarily during household storage. While the difference in microbiological quality was statistically significant ( $p < 0.001$ ) between tap water and household storage, there was no statistically

63 Organisation for Economic Cooperation and Development, *Managing Water For All: An OECD Perspective on Pricing and Financing: Key Messages for Policy Makers* (OECD 2009) <<http://www.oecd.org/env/42350563.pdf>> accessed 6 October 2013.

64 WHO (n 14) 284.

**Table 1. Comparison of mean costs of water from different sources (\$US/m<sup>3</sup>)**

Water source	Mean cost of water (USD/M <sup>3</sup> )	
	Addis Ababa	Kisumu
Official supply network		
Household connection	0.18	0.49
Yard tap	0.67	Not common
Household resale	2.88	Not common
Standpipe	0.77	2.23
Other standpipe	Not available	1.86
Wells	Not available	1.15
Handcart	Not available	6.72

Source: Data from the water usage study of 310 households conducted in Kisumu and Addis Ababa.

**Table 2. Summary of the microbiological analysis of the water samples taken in Kisumu and Addis Ababa**

Water source	Number of samples	Positive TCC detects (%)		
		Kisumu	Addis Ababa	Combined
All samples	414	84.0	40.2	73.7
Tap (standpipe/house tap)	81	26.1	20.0	23.5
Well	98	96.9	100 <sup>a</sup>	96.9
Handcart container	39	69.2	–	69.2
Household storage	184	100	51.9	86.4
Borehole	6	50.0	25.0	66.7
Tanker	3	0	0	0
Spring	4	–	50.0	50.0

<sup>a</sup>There was only one well sample from Addis Ababa.

significant difference between the tap water and handcart containers ( $p = 0.735$ ) or tankers ( $p = 0.640$ ).

The Kenyan water sector has undergone significant reform in recent years with the enactment of the Water Act 2002.<sup>65</sup> This Act has created, or envisages the creation of, several institutions, including the Water Resources Management Authority, the Water Services Regulatory Board, Water Service Boards, the Water Services Trust Fund, the Water Appeals Board and Water Service Providers. Water Service Boards are licensed to provide water services, with their activities regulated by the national regulatory authority, the Water Services Regulatory Board. Water Service

65 Albert Mumma, 'Kenya's New Water Law: An Analysis of the Implications for the Rural Poor' (International Workshop on 'African Water Laws: Plural Legislative Frameworks for Rural Water Management in Africa (26–28 January 2005, Johannesburg, South Africa) <<http://www.nri.org/water-law/AWLworkshop/MUMMA-A.pdf>> accessed 6 October 2013.

Boards are required to engage Water Service Providers to operate the water supply system within defined areas within their jurisdiction.

Within this framework for the supply and management of water services, the Water Act 2002 does not contain any provisions that expressly deal with SIPs. The licensing system that it establishes, however, operates on the basis that the supply of water in quantities over certain amounts is made subject to a license. Section 56 of the Water Act 2002 sets out a requirement for a license and states:

No person shall, within the limits of supply of a licensee (a) provide water services to more than twenty households; or (b) supply – (i) more than twenty-five thousand liters of water a day for domestic purposes; or (ii) more than one hundred thousand liters of water a day for any purpose, except under the authority of a license. A person who provides water services in contravention of this section shall be guilty of an offence.

Further to this, Section 57 of the Water Act 2002 provides that only the Water Services Boards may apply for licenses thus giving them monopoly rights within the geographic areas in which they are mandated to operate. Any person, therefore, would be committing an offence under this provision if they supplied water in excess of the specified limits if doing so in an area where a Water Services Board has already been granted a license. Kisumu falls within the jurisdiction of the LVSWSB that has made a service provision agreement for the operation of the water supply infrastructure in Kisumu with KIWASCO. So, the effect of these provisions is that anyone can supply water (without a license) if they do so below the quantitative limits. Above these limits, a licence is required, but only the Water Services Boards have power to apply for such licenses. The criteria used by the regulator to decide whether or not to grant a licence to the Water Services Boards relate to the technical, financial, managerial and commercial capacity of not only the applicant Water Services Board, but also the Water Service Providers engaged by the Board. All areas of Kenya have established Water Services Boards. Given the water supply limits imposed by the Water Act 2002, it follows that almost all well and borehole operators and mobile water vendors are operating illegally since they do not have the authorisation of the LVSWSB in the form of a service provision agreement. Above the limits only the licensee and anyone they authorise can supply water; below the limits anyone can supply water. So, the regulatory framework established by the Water Act 2002 does contemplate a mixed supply of water. But, a handcart operator is likely to support more than 20 households per day during busy periods, while a tanker trucker could be expected to supply approximately 50,000 litres of water for domestic purposes each day. A well or borehole operator, if they sold water to a single handcart operator, is likely to supply more than 20 households a day and also to exceed the volumetric constraints imposed by the Water Act 2002. Ironically, the LVSWSB (in common with all other Water Services Boards) as the monopoly licensee and as agent of KIWASCO, is insulated from competition in circumstances where it is not able to provide a full service to its customers.

Currently, and inevitably as a result of the above provision, the price and quality of the water provided by illegally operating SIPs are not regulated. The exception to

this lack of regulation is the standpipe operators who have a contractual relationship with KIWASCO and are expected to adhere to a recommended retail price. Only some standpipes are currently allowed to operate by the LVSWSB as they have relevant service provision agreements with KIWASCO and purchase their water in bulk at a flat rate. However, price control is not being actively enforced so in practice, price regulation is completely absent, as is the regulation of water quality.

In 2000, the federal government of Ethiopia enacted the Water Resources Proclamation.<sup>66</sup> One of the provisions of this proclamation states:

.... no person shall perform the following activities without having obtained a permit from the Supervising body: (a) construct waterworks; (b) supply water, whether for his own or for others; (c) transfer water which he/she abstracted from a water resource or received from another supplier...

While some activities are exempted from this provision none seem to be significant for the legal operations of SIPs. Apart from this and other minor provisions, the Proclamation does not contain detailed rules on the regulation of water providers. There is no framework law that provides conditions under which the private sector can be involved in the supply of water, with the function of water supply belonging to regional and local government.

The Water Resources Proclamation requires permits for water supply across the country, however, in Addis Ababa such a permit is unlikely to be granted since the law which established the city's water authority clearly prohibits the supply or resale of water. The only exceptions to this are official standpipes operated under an agreement with the water authority. Apart from the licensed standpipes, there are in existence water kiosks and neighbour sellers who are clearly operating in contravention of the law. The legal provisions that prohibit such activities are not actively enforced but the tariff structure employed by the water authority (with the exception of the licensed standpipes) is expected to discourage the resale of water due to a progressively increasing tariff rate being applied that makes the water more expensive when taken in larger volumes. Due to the existence of unlicensed water vending not being acknowledged and therefore operating outside the law, there are no controls on the price or quality of the water provided by water vendors.

## 6. DISCUSSION

The sources of water for the water vendors in Addis Ababa and Kisumu differ. In Addis Ababa, they are wholly dependent upon the municipal supply system as their source, but in Kisumu, vendors sell water from privately owned boreholes and wells in addition to reselling municipal supplied water. Water drawn from these boreholes and wells in Kisumu is significantly lower in quality than municipal supplied water and is not, therefore, the preferred source by a majority of customers for drinking. But, this well and borehole water plays an important role in bringing total average water consumption in Kisumu up to an acceptable level where it is used for non-

66 Ethiopian Water Resources Management Proclamation 2000 <<http://faolex.fao.org/docs/pdf/eth44004.pdf>> accessed 6 October 2013.



consumptive purposes. Our water usage study which formed part of the research project<sup>67</sup> showed that whereas average daily water consumption in areas un-served or poorly served by the official water utility in Addis Ababa is an inadequate 14.6 litres per capita per day, in equivalent areas in Kisumu, it is twice as much at 34 litres per capita per day. A caveat to the advantages of an increased supply is the extent to which this means that Kisumu households are at risk of drinking poor quality water.

The water usage analysis suggests that mobile water vendors do not cause significant deterioration in water quality between the point of collection and the point of delivery. They supply water in a similar state to what it was in when they collected it from their supplier. This is not surprising as there are no significant delays in the supply chain and the water containers are kept in a reasonably clean state given that they are on public display and are viewed by the customers. In common with the results of other studies,<sup>68</sup> the most significant deterioration in water quality occurred during household storage. Such household storage—a common feature of these communities in developing countries—results from a lack of (or insecure) piped supplies.

Mobile water vendors (the SIPs who operate at the final point of the informal supply chain), engaged in the delivery of water from source to door, do not necessarily provide water of inadequate quality or of a worse quality than their source which may already be contaminated. But, their activities are essential, effectively extending the coverage of the municipal water system in developing countries into underserved and un-served areas. This compensates for the intermittent municipal supply for those with piped water and saves the time and energy of the customers both in informal settlements and middle-income housing by bringing the water to their door.

While household expenditure on water is commonly very high amongst low income households, this does not appear to be due to profiteering amongst water vendors. Indeed, the relatively low entry barriers and large numbers of vendors, market forces and competition between vendors, makes exploitation difficult, with the incomes of water vendors relative to other informal sector jobs confirming this. In Addis Ababa, for example, the average net income for a standpipe operator is estimated to be \$US7.80 per month and thus falls below the official poverty line. In Kisumu, the average net monthly income of a standpipe operator is \$US97.02, however, incomes are variable and ranged from as low as \$US22.39 per month to as high as \$US447.80 per month amongst standpipe operators in Kisumu. (The official poverty line in Kenya is \$150 per month for a household.) Handcart vendors' incomes vary between \$US183.58 and \$828.38 per month, reflecting the hard physical labour of this job. While some SIPs have incomes below the poverty line of Kenya, most earn incomes comparable with earnings in other informal sector jobs. SIPs appear to provide a competitive service for the urban poor rather than exploitative of that sector. Mobile water vendors, for instance provide water to the more difficult to serve

67 (n 3).

68 Eric Mintz, Fred Reiff and Robert Tauxe, 'Safe Water Treatment and Storage in the Home: A Practical New Strategy to Prevent Waterborne Disease' (1995) 273 *J of the American Medical Association*, 948; Stephen Gundry, Jim Wright and Ronan Conroy, 'Household Drinking Water in Developing Countries: A Systematic Review of Microbiological Contamination Between Source and Point-of-use' (2004) 2 *Journal of Water and Health* 1.

consumers through labour intensive processes and they inevitably face higher supply costs which they pass on to their customers.

While government agencies have engaged with water vendors in some countries with some success, progress has for the most part been limited in part due to a lack of formal recognition of SIPs.<sup>69</sup> Focus group sessions<sup>70</sup> with SIPs showed that they did not dismiss the idea of their activities being regulated (although they preferred this to be done by some form of voluntary regulation—a desire frequently to be found amongst most stakeholders in any business or industry). But they did recognise the critical importance of controls on quality in relation to public health concerns. Hence, there is a case to be made for formally recognising SIPs due to the vital role they play in helping people meet their basic water needs and the need to ensure drinking water quality. This may also include regulating the price of water charged by standpipe operators who benefit from a favourable tariff from the water utility. For other types of SIPs, the case for price regulation is weak. They do not benefit from subsidies and thus setting prices below the market rate would be likely to drive such vendors out of business with the consequent risk of reduction in the water supply.

Regulation of water quality and the implementation of other measures to improve human health are very relevant to the attainment of the human rights to life and to water and represent an urgent finding of the study where the supply of water is, in large part, delivered by SIPs. The water usage study showed that in Kisumu, most wells currently fail to meet the WHO drinking-water quality guidelines,<sup>71</sup> but the supply of well water helps boost water supply to households for non-consumptive purposes to an acceptable level. So, this source of water aids quantity albeit failing on the quality front. It therefore fails to assist in the achievement of the MDGs as it does not provide access to an 'improved water source'. The semi-structured interviews and survey of households in Kisumu showed that where possible people are careful to use the lower quality but cheaper well water for non-potable uses while using municipal water for drinking. However, where water is bought from handcart vendors rather than directly from a well or municipal standpipe, households cannot be completely sure of its origin. Given that point-of-use water quality interventions have been shown to produce better health outcomes than water supply or source treatment,<sup>72</sup> educating households about safe water storage and treatment options may produce a better outcome than prohibiting water vendors and depriving many households of their main water source. Regulation is needed to ensure that water vendors follow best-practice guidelines so that water consumers dependent upon their services can have more confidence in the safety of the water supplied. In part, this could be achieved by improving the implementation of good practice guidelines for the design and operation of wells. Further guidelines could be established for water vendors, in addition to routine water quality testing and random inspection of

69 Kevin Sansom, 'Government Engagement with Non-State Providers' (2006) 26 *Public Administration and Development* 217.

70 Three focus group discussions took place (n 55).

71 WHO (n 14).

72 Hugh Waddington and others, 'Water, Sanitation and Hygiene Interventions to Combat Childhood Diarrhoea in Developing Countries' (2009) 1 *Journal of Development Effectiveness* 295.

mobile water vendors to ensure proper description of the source of water and thus prevent mis-selling.

The regulatory frameworks which were analysed as part of this project demonstrate the fact, common to many developing countries, that SIPs are excluded from formal regulatory frameworks which were devised to regulate bulk supply by monopoly providers. It is true that long-term and permanent improvements to municipal systems can be achieved. Evidence shows that this can be achievable in a relatively short period of time. In Phnom Penh, for example, service coverage increased from 38% to 90% of the population and from 10 to 24 hours per day between 1993 and 2008 where the reforms of the post-war Cambodian government resulted in radical change. The Phnom Penh Water Supply Authority was turned into a model public water utility with a 24-hour drinking water service, subsidies to the poor through connection fees and tariffs, the supply of non-revenue water reduced to 6%, and successful collection of bills at a rate of 99%.<sup>73</sup> Without such governmental commitment, long-term objectives to achieve a total municipal system may involve expensive engineering solutions which may be prohibitive or politically unachievable in the foreseeable future; in the meantime, people are left without the fulfilment of their basic rights.

Solutions need to recognise the reality of the situation and be designed for potential longevity. The transplant of Western legal approaches to solve a developing world problem is plain to see in the nature of the legal provisions that were analysed. Developing countries are routinely involved in legal transplants borrowing expertise from the industrialised world in devising written constitutions,<sup>74</sup> governance structures, property rights<sup>75</sup> and business models. For example, in developing a range of frameworks for the regulation of public and environmental health and pollution, developing countries look to models in existence in the industrialised world—models which may have their roots in nineteenth century legislation<sup>76</sup> when wealth and prosperity was being built through industrial development against a background of social stability.<sup>77</sup> The background in many developing countries does not reflect such prevailing circumstances. Social and political instability and levels of corruption<sup>78</sup> mean that even where infrastructures have been developed, the failure to repair, renew and maintain is endemic. The transplant of a Western regulatory model that depends on

73 Ek Sonn Chan, 'Bringing Safe Water to Phnom Penh's City' (2009) 25 *Water Resources Development* 597.

74 Morton Horowitz, 'Constitutional Transplants' (2009) 10 *Theoretical Inquiries in Law* 535.

75 Robert Home (ed), *Local Case Studies in African Land Law* (Pretoria University Law Press 2011).

76 See eg the UK Nuisances Removal and Diseases Prevention Act 1855.

77 Asa Briggs, *Victorian Cities* (Penguin 1968); Anthony S Wohl, *The Eternal Slum: Housing and Social Policy in Victorian London* (Edward Arnold 1977); JPS McLaren, 'Nuisance Law and the Industrial Revolution' (1983) 3 *OJLS* 160; Gertrude Himmelfarb, *The Idea of Poverty* (Faber & Faber 1984); Ray Cocks, 'Victorian Foundations?' in John Lowry and Rod Edmunds (eds), *Environmental Protection and the Common Law* (Hart Publishing 2000); Rosalind Malcolm and John Pointing, 'Statutory Nuisance: the Sanitary Paradigm and Judicial Conservatism' (2006) *JEL* 35; Rosalind Malcolm and John Pointing, *Statutory Nuisance Law and Practice* (2nd edn, OUP 2011) ch 3.

78 Glenn Hollands, *Corruption in Infrastructure Delivery - South Africa: Case Study* (WEDC South Africa 2007); Purusottam Man Shrestha, *Corruption in Infrastructure Provision and Service Delivery at the Municipal Level in Nepal: Case Study* (WEDC Kathmandu Nepal 2007); Transparency International, *Global Corruption Report 2008: Corruption in the Water Sector* (CUP 2008).

such levels of social stability, independent legal systems and effective enforcement regimes, is highly likely to be ineffective.<sup>79</sup> Indeed, where social and economic structures become over-extended in the developed world, its own regulatory models can frequently fail.<sup>80</sup> The management of water supply is an example where developing countries have sought to transplant such regulatory frameworks.<sup>81</sup> The Kenyan Water Act 2002 is an example of this phenomenon in that it assumes bulk supply and excludes from its provisions the activities of SIPs. Regulatory frameworks reflecting practice from developed countries may not work within developing countries for a variety of reasons.<sup>82</sup> For instance, the nature of the economic actors to be regulated may be different. In developed countries, national regulatory frameworks for water provision are developed taking into account that the regulated are relatively large conventional utilities.<sup>83</sup> Even where in the industrialised world, non-state (or quasi-state) actors are used and key utilities industries are privatised, such industrial concerns are frequently the antithesis of local small businesses.<sup>84</sup> More usually, they are multi-national concerns that bid across state boundaries for service contracts within a regulatory framework which is designed for large conventional utilities. And it is true that almost all of the populations of industrialised countries are served by these utilities and thus the equivalent of SIPs, simply do not exist. The reality in developing countries is however markedly different. SIPs are completely different from conventional Western utilities in their size and business models yet serve large sections of the community as do conventional utilities in industrialised countries. Therefore, to transplant a Western regulatory framework, which is suited to conventional bulk supply utilities, into developing countries, will not achieve its purpose. In making such transplants, attention should be directed at the practical reality of the diverse nature of the regulated industry in the host country.

The coexistence of formal and informal providers has a long history and a key argument for the regulation of SIPs is the need to recognise the reality of the current

79 Alan Watson, *Legal Transplants: An Approach to Comparative Law* (University of Georgia Press 1974); Otto Kahn-Freund, 'On Use and Misuse of Comparative Law' (1974) 37 *MLR* 1; William Ewald, 'Comparative Jurisprudence (II): The Logic of Legal Transplants' (1995), 43 *American J Comparative L* 489; Michele Graziadei, 'Comparative Law as the Study of Transplants and Receptions' in Mathias Reimann and Reinhard Zimmermann (eds), *The Oxford Handbook of Comparative Law* (Oxford 2007).

80 Note the regulatory failures in the case of food, see Matthew Taylor 'Horsemeat Scandal: Government Warned Two Years Ago', *The Guardian* (London, 17 February 2013) <<http://www.guardian.co.uk/uk/2013/feb/17/horsemeat-scandal-government-warned-claim>> accessed 6 October 2013.

81 See eg Colin Kirkpatrick, David Parker and Yin-Fang Zhang, 'Price and Profit Regulation in Developing and Transition Economies: A Survey of the Regulators' (2005) *Public Money and Management* 99.

82 Ugo Mattei, 'Efficiency in Legal Transplants: An Essay in Comparative Law and Economics' (1994) 14 *International Review of Law and Economics* 3; Ugo Mattei, 'A Theory of Imperial Law: A Study on US Hegemony and the Latin Resistance' (2002) 10 *Indiana Journal of Global Legal Studies* 383. See also Robert Home, *Of Planting and Planning: The Making of Colonial Cities* (2nd edn, Routledge 2013) ch 7.

83 David S Saal and David Parker, 'Productivity and Price Performance in the Privatized Water and Sewerage Companies of England and Wales' (2001) 20 *Journal of Regulatory Economics* 61; Peter T Robbins, 'Transnational Corporations and the Discourse of Water Privatisation' (2003) 15 *Journal of International Development* 1073; Karen Bakker and others, 'Governance Failure: Rethinking the Institutional Dimensions of Urban Water Supply to Poor Households' (2008) 36 *World Development* 1891.

84 EL Lynk, 'Privatisation, Joint Production and the Comparative Efficiencies of Private and Public Ownership: The UK Water Industry Case' (1993) 14 *Fiscal Studies* 98.

situation for water supply in many urban and peri-urban settlements. Steps must be taken to regulate to achieve improvements in water quality, improve public health and prevent further environmental degradation represented by the uncontrolled development of water sources.<sup>85</sup> The regulatory culture necessary to implement these steps must reflect the reality of the supply system in developing countries and not seek to transplant Western regulatory frameworks devised for bulk supply.

## 7. CONCLUSION

Extending the coverage, improving the reliability of municipal systems and ensuring affordable access by the urban poor to such systems is an ideal solution to water supply problems in many developing countries. But technically expensive solutions, turbulent political backgrounds and levels of corruption preventing public service solutions to environmental health problems, all operate as barriers to the development of municipal service provisions. It remains the case that, until municipal solutions are achieved, ignoring the part played by SIPs is potentially misleading as it fails to consider the very significant role being played by these vendors in filling gaps left in the piped water system. The virtual pipe system that they provide needs to be formally recognised and brought within the regulatory framework. Undesirable as this may at first sight appear to those SIPs in our study who viewed regulation as a burden, nevertheless, such a step would enable SIPs to operate in a stable fashion without fear of sudden closure or seizure of equipment. Formal recognition bringing such stability would encourage investment and development thus enabling the improvement of the water provision. An approach recognising the existence of small scale providers which brought oversight and control through an effective enforcement regime would assist in the improvement of safe drinking water sources. In both countries examined as part of the study, registration of drinking water sources and inspection are already elements of the regulatory framework and bringing those aspects to bear in relation to SIPs would improve the availability of safe drinking water. Currently, in Kenya, the regulatory frameworks exclude low throughput of water supply thus leaving many SIPs outside the regulatory framework. In Ethiopia, there is a general failure to acknowledge and recognise the existence of SIPs. An adaptation of existing laws so as to recognise the operational importance of the supply chain in developing countries would achieve formal recognition of SIPs. Extending current provisions to the low throughput supply nature of SIPs and bringing them generally into the extant regulatory framework, while not being without cost, would be an effective mechanism for improving the security and safety of the drinking water supply. Formally recognising SIPs and thereby enabling them to receive training and education from the enforcement agencies—an important activity of regulators—will enhance quality. Once recognised and registered as formal operators, good practice guidelines for such matters as the operation of wells and boreholes could be integrated into requisite training for such SIPs. A necessary system of random or risk-based inspection specifically devised for SIPs, of the unimproved and most

85 Baietti and Raymond (n 11); Bakker and others (n 83) 1893. But see José Esteban Castro, 'Neoliberal Water and Sanitation Policies As a Failed Development Strategy: Lessons from Developing Countries' (2008) 8 *Progress in Development Studies* 63, 67.



vulnerable water sources, would help to reduce health risks within the water supply chain. Ignoring the existence of SIPs and leaving them as a largely unregulated industry exposes large sections of population to risk and harm to health. The MDGs seek to achieve access to safe drinking water through improved water sources. Controlling the unimproved water sources represented in the supply chain of SIPs, which are relied on by large numbers of people in the urban areas of developing countries, through registration, inspection, education and training of the operators, would enable real progress towards the satisfaction of this goal. An overall aim of the concept of sustainable development is to achieve equity between the peoples of the developing and industrialised worlds and ensuring a basic standard in respect of the provision of safe drinking water is a prerequisite to its attainment. A step in that direction is the fulfilment of the MDGs and realisation of the human right to water which will be enhanced by measures for the integration of SIPs and their essential virtual supply system into regulatory frameworks.