

THE REGULATORY IMPLICATIONS OF THE RIGHT TO WATER: SMALL-SCALE AND INDEPENDENT WATER PROVIDERS IN ETHIOPIA AND KENYA

Mulugeta M. Ayalew ^a, Rosalind Malcolm ^b, Lorna Okotto ^c,
Steve Pedley ^d, Jonathan Chenoweth ^c and Yacob Mulugetta ^c

^a School of Law, University of Surrey, Guildford, Surrey, UK.

^b Environmental Regulatory Research Group, University of Surrey, Guildford, Surrey, UK.

^c Center for Environmental Strategy, University of Surrey, Guildford, Surrey, UK.

^d Medical School, University of Surrey, Guildford, Surrey, UK.

^b Corresponding author: r.malcolm@surrey.ac.uk

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Abstract: Small-scale and independent water providers serve up to fifty percent of the population in urban centers in many of the developing and less developed countries. However, they remain largely unrecognized and unregulated. This article argues, based on the public interest theory and two case studies of the price and quality of water by small-scale providers, that there is a compelling case for regulation of small-scale water provision. The human right to water imposes an obligation on states to regulate small-scale water supply market. It also means that governments should avoid regulation which does not have support in public interest theory and empirical facts as this might constitute violation of the right to water.

Keywords: Small-scale water providers; price and safety regulation; duty to regulate; and human right to water

I. INTRODUCTION

This article is prepared drawing on the key findings of a research project which explored the legal status, business models, costs and quality of water by what are referred to henceforth as small-scale and independent providers (SIPs). They are known by different names such as ‘independent providers’, ‘informal providers’, ‘water vendors’, ‘mini-utilities’, ‘non-state providers’, ‘the other private sector’ and so on. Significant proportions of the population in urban

centers of many developing and less developed countries depend on them [1]-[3].

In some urban centers, the official providers have high coverage in terms of size of the distribution network and number of private connections as in, for example, Manila where two private operators have 85 and 93 percent service coverage [4]. However, their performance records as measured by the number of hours or days the service is actually provided to customers is inadequate. The demand left unsatisfied during such period of time as when there is interruption of service is met by SIPs [5]. A number of legal and administrative barriers such as the requirement to cover the connection cost and pay deposit also prevent many households from being connected [6], [7]. These households rely on SIPs. SIPs are pioneers in the development and operation of water systems in peri-urban, rural and remote areas where official providers either do not exist or are not able and willing to serve [5]. They are prominently present in informal settlements and low income areas. Official providers are often reluctant to extend services to such areas because of precarious and illegal land tenure and a number of other factors [3], [6], [8]-[10].

SIPs are not limited to particular income groups and parts of the city; they serve middle, lower and upper income families [2]. Therefore, when the water provided by the official utility is not satisfactory, even well-to-do-residents in formal neighborhoods resort to SIPs [10]. This seems to justify Solo’s statement that SIPs are ‘income and class-blind’ [2].

SIPs have huge potential in serving areas and groups of people left un-served by official providers. Their potential is linked with certain features of their business model which are particularly suitable to the needs of households whom they regularly serve and also the conditions under which they often operate [1]-[3], [8], [10]. In addition, any improvement by the official utilities is expected not to match the pace of urbanization and as a result SIPs are likely to remain for the foreseeable future the only source of water for the urban poor [10].

Solo reports that some provide water at higher prices [2]. Studies further suggest that the majority of unserved and inadequately served populations, who rely on SIPs and other sources, tend to be mainly the poor [2], [11]. This puts the poor in a more disadvantaged position as they pay high prices, not only per unit cost but higher in terms of affordability, often ranging from 9 to 20 percent of their income [12]. The World Bank further observes that such poor people tend to pay more than their richer counterparts in the same city [13].

SIPs have further been described as providing water of questionable quality [14]. Where the water sources are unprotected, they become susceptible to external contamination from surface runoffs, windblown debris, human and animal fecal pollution and sometimes unsanitary collection methods among others [15]. Marvin and Laurie further note that people without access to a formal network usually buy water from private vendors and that this means not only having access to more polluted water, but also more interruptions to supply along with its associated problems including, among others, substantial economic, health, social and environmental costs of uncertain water supply [16].

The WHO further suggests that some may provide water that may be inadequately treated or transport water in inappropriate containers creating the potential of contamination, even for water that may have been safe [17]. Households who receive their water supplies from some SIPs are therefore categorized as not having reasonable access to safe drinking water.

Lack of legal framework which recognizes the operation of SIPs is mentioned as the main constraint [3]. In some countries, as for example in Ghana, the law prohibits the resale of water [10]. In others as in Tanzania the operation of SIPs is conditional upon getting a business license [10]. Even though such prohibitions or requirements are rarely enforced, their existence creates a room for officials to harass small-scale providers as in, for example, Khartoum [10], [18]. Although in some cases the operation of SIPs is not clearly prohibited, the official provider is given the exclusive right to supply water within a certain

defined geographic areas. As a result, operation of SIPs in such areas is considered to go against the interest of the official provider, if not the public interest. The supply of water and sanitation services is regarded as a natural monopoly and hence competition in this industry is conventionally assumed to be undesirable or an unnecessary waste of resources. It is on the basis of this rationale that official providers are given a monopolistic position. However, an attempt to enforce this privilege against SIPs without managing to extend the formal service to all residents within that area is unacceptable [19].

As a result of these positions taken by the law in many countries, it seems, the activities of small-scale providers are virtually unregulated. The price they charge is generally uncontrolled by any public agency. There are no standards of quality imposed and enforced upon SIPs. On the basis of these observations, many have argued for the recognition and regulation of SIPs [5], [10], [20]-[22]. However, the literature is short on materials dealing with the need to regulate the price and quality of water by SIPs. They are not regulated, but should they be regulated?

This article critically examines the need for regulation of the price and quality of water provided by SIPs. The discussion is made drawing on the case studies carried between September 2006-September 2009 in Addis Ababa (Ethiopia) and Kisumu (Kenya). Kisumu is the third largest city in Kenya. Located on the western part of Kenya at an altitude of 1300 meters above sea level, Kisumu covers an area of about 415 km². Many of the residents generally fall into the low income bracket, posing a challenge to affordable water service provision.

Addis Ababa, the capital city of Ethiopia is located in the central highlands of Ethiopia, covering an area of 530 km². The city is at an elevation ranging from 2000-2800 above the sea level. The current population is estimated at over 3 million and by 2020 it is expected to increase to nearly 6.5 million. This increase will place enormous pressure on public service delivery.

II. SIPS IN ADDIS ABABA (ETHIOPIA) AND KISUMU (KENYA)

A. Addis Ababa (Ethiopia)

There is no national government organ charged with provision of water and sanitation services; it is rather the responsibility of regional and local governments. The official water utility, Addis Ababa Water and Sewerage Authority (AAWSA), is a department of the city government [23]. It owns and operates the water supply system in the city and has a statutory monopoly [23]. Its activities are financed by

the annual government budget and its revenue reverts to the general account of the city government.

About ninety-eight percent of the city's water can be traced back to AAWSA. This does not, however, translate into corresponding proportion of households having their own private connection; only 40 percent of the households have direct connection to the water supply network. Significant proportions of the population rely on SIPs which take different forms.

One form of SIPs is what is called public fountains. These are *kebele* (the lowest administrative unit of the city government) administered water collection points. They are operated by individuals employed by the *kebele* administration. However, a number of them are not currently operational. The remaining ones operate only for few hours a day.

The other forms of SIPs are owned and operated by community groups. These are common particularly in newly settled areas in the outskirts of the city. Community groups pool their resources together to get a public standpipe. They also negotiate with AAWSA to be categorized as public fountains for the purpose of getting favorable tariff rates [24]. These are temporary solutions. They remain in operation until every member of the community group manages to get his/her own private connection. This is because once the water supply network had been extended to the locality it is relatively easy for each household in that locality to get a private connection.

Also common are neighbor sellers and water kiosks. They do not have any kind of special relationship with AAWSA apart from the ordinary contractual relationship which every customer has. As such they do not benefit from the flat rate which authorized standpipes benefit from. They are found across the city. They regularly serve poor households who cannot afford private connections for a number of reasons. In a period of interruption, they also serve other households who are normally connected to the official network. Their presence is not restricted to a certain section of the city. What is different about the city of Addis Ababa compared to other African cities is that it was not developed by colonial powers and in a planned manner. As a result the poor households are found almost evenly distributed throughout the city. As these are households who do not have their own private connections, they rely on water kiosks. Water kiosks are general grocery shops who sell water by the bucket.

Recently as the city has expanded in size, households in newly settled areas have found themselves very poorly served by AAWSA. Because of the shortage of water during the long dry season and other factors, there are times when households in these areas get running water only once a week. This has created a business opportunity for mobile water

vendors who transport water by donkey or trucks from areas where there is running water. The same people also serve the growing water demand of the construction sector.

In conclusion, it can be said that SIPs have a large presence in the city of Addis Ababa. They serve: 1) poor households that do not have private connections; 2) households in informal and new settlements; and 3) areas where there is interruption of water supply. It is difficult to quantify the number of households who rely on these alternative means of supply as many of the so-called private connections are also shared among several households.

It should also be noted that the type of SIPs common in Addis Ababa are not independent in the sense of having a separate source of water like wells and boreholes [5].

B. Kisumu (Kenya)

Kenya is divided into seven main catchments. For each catchments, a state corporation known as Water Services Board is established [25]. The Water Services Boards are developers and owners of the water supply and sewerage system within their respective jurisdiction [26]. The water supply systems are, however, operated by water companies (known as Water Services Providers, WSPs) based on service provision agreement with the relevant Water Services Board [26]. Therefore, a Water Services Board may contract the operation of water supply and sewerage systems it develops and owns to different WSPs.

The city of Kisumu is found within the Lake Victoria South catchments. The Lake Victoria South Water Services Board (LVSWSB) develops and owns systems of water supply and sewerage in these catchments [27]. And Kisumu Water and Sewerage Company (KIWASCO), currently wholly owned by the municipality, are contracted by LVSWSB to provide water and sewerage services in the city [28].

In Kisumu, where the performance of KIWASCO is limited by not only inadequate network coverage but also insufficient amount of daily water production, the demand left unsatisfied is met for by various forms of SIPs.

Standpipe operators have in most cases a contractual relationship with KIWASCO. They are connected to the official water supply network. There are two kinds of standpipe operators. Some of them have contractual license to resell water to other people and are also charged a flat rate by KIWASCO. There are others who are connected to the official network like any household and resell water to other people. They do not have contractual license and hence are not beneficiaries of the flat rate. KIWASCO prescribes the price of water to be charged by the standpipe operators. However, such restrictions are not adequately and proactively

enforced. Nor is there a system for the enforcement of this prescription. Standpipe operators sell water directly to consumers (usually those households which are nearby) and to mobile water vendors, which are the other form of SIPs.

In the last few years, KIWASCO has started working in collaboration with SIPs in what is called delegated management model. This is an attempt to take the already existing standpipe operators beyond selling water. Accordingly, KIWASCO would extend the network up to a certain point, extensions from which are then done and managed by appointed operators. The water from this point would be metered and the operator would be charged based on the meter reading, albeit at a flat rate. The operator can in turn establish different water collection points by extending the pipeline from the main meter and could even connect households directly to the secondary network. This arrangement is said to be in the interest of poor households and people living in slum areas and informal settlements. It is expected to result in several benefits including, but not limited to reduction of the level of unaccounted-for water, low retail prices and increased revenue for KIWASCO.

There are also people who have dug well (or sunk borehole) in their premises and sell water directly to consumers and to mobile water vendors. They do not have any relationship with KIWASCO. They do not have also a permit to abstract water and in most cases they are not also required to do so [26].

Whereas mobile vendors normally address the problem of access resulting from inadequate physical infrastructure or the unreliability in supply, well and borehole operators address the problem of access emanating from the inadequate volume of water produced by KIWASCO.

Currently there is one small-scale provider which can be characterized as a mini-utility. Its operation resembles a conventional water utility except that it is not involved in water distribution. This provider abstracts water from Nyamasaria River to its treatment plant. After the water is treated, it is sold to nearby households or mobile water vendors. As opposed to well operators, abstracting water in this manner requires permit. The owner of this water supply system has acquired permits for abstracting water from the river and building the water treatment facility. In addition, the owner claims to have an agreement with the LVSWSB to continue supplying water until KIWASCO manages to extend its water supply infrastructure to the surrounding area.

Mobile water vendors are also a prominent part of the water supply system in the city of Kisumu. There are two main types of mobile water vendors: hand-

cart pushers and tanker-truckers. Hand-cart pushers are numerous in number. They operate a hand-cart which carries 12 jerry cans each of which carries 20 liters. They purchase water from standpipe or well operators and move it around the city in search of a customer. There are few tanker-truckers in the city; many of them are owned by businesses and hotels. This is not surprising considering the start-up capital which is required for this model of water supply. The existing truckers purchase their water from borehole operators or Nyamasaria water works and usually sell it to high water users such as factories, bakeries and hotels.

C. Price of Water in Addis Ababa and Kisumu

In Addis Ababa water from water kiosks costs the highest at 30 Birr/m³ (US\$3.09/m³). This is followed by public fountains (*kebelle* administered standpipes) the price of which range from 5-10 Birr/ m³ (US\$ 0.515-1.031/ m³). The figures suggest that households getting water from water kiosks pay the highest even in terms of price per cubic meter which is seventeen times greater than the rate applied by AAWSA to households with private connection. It is twenty times greater than the rate public fountains are charged by AAWSA (1.45 Birr/ m³). It is ten times greater than the rate applied by AAWSA to commercial users (3.3 Birr/ m³). Public fountains sell water at 3.45 to 6.90 times the price at which they get water from the utility. Tap in the yard (neighbor sellers) costs 6.5 Birr/ m³ (US\$ 0.67/ m³) while households with private connection charged at 1.75 Birr/ m³ (US\$0.180/ m³) costs the lowest. Households in the poorly served new or upcoming areas (both poor and non-poor) without connection seems to generally incur the higher costs compared to those in older parts of the city. Household expenditure on water in Addis Ababa ranges from 7.5 to 54 Birr per month. The average proportion of household expenditure on water was lowest among those using yard taps at a range of 4.5-8.0% or an average of 4.7% of income of poor households in the wet season. The average highest proportion of income was spent by those using water kiosks which totaled to between 19.3-34.3% (mean of 20.3%) and 28.5-50.7% (mean of 30.0%) of the income of poor households in the wet and dry season respectively for all the sources combined. Based on the data on average monthly expenditure for all sources, low income households, with their mean monthly income of Birr 193 (US\$ 94.13), spend an estimate of 10.2% and 15.4% of their income on water in wet and dry season respectively.

In Kisumu handcart vended water costs the highest ranging from Kshs. 400-500/m³ (US\$ 5.97-7.46/m³) in wet season to

Kshs. 400-1000/m³ (with an average of Kshs. 875/m³ (US\$11.19/m³)) during dry season. Households with connection to the piped network using official utility first block tariff pay Kshs. 33/m³ (US\$0.49) for 1 to 10 m³. Thus those using handcart vended water pay 12.12-15.15 times paid by those with household connections during wet (no shortage) season and much higher during dry season. The standpipe operators on the other hand get water at Kshs. 55/m³ (US\$ 0.82/m³) and Kshs. 25/m³ in the delegated model and resell the same at about 150-200/m³ (US\$ 2.34-2.99) for households collecting directly; they, thus, make a profit about two to three times what they pay for the same water. Water from a standpipe owned by Namasariya Water Works costs a constant price of Kshs. 125/m³ (US\$1.86) to households collecting directly but at a discounted rate Kshs. 75/m³ (US\$1.12) for handcart vendors. Well water costs the least with household collecting directly paying Kshs 100/m³ (US\$1.492) but handcart vendors are given at a discounted rate or a wholesale price ranging from Kshs. 62.50-75/m³ (US\$0.93-1.12) per handcart filled with an average of Kshs. 68.75/m³ (US\$ 1.03). This water is in turn sold to households at the same price as water drawn from the standpipes/kiosks, thus making a profit of 8.5-13.5 times during wet season and 13.5 to 18.5 times during dry season. This is contrary to a popular belief that mobile vendors sell water according to the source (well or standpipe). For Kisumu, with the exception of water sold at the standpipe supplied by water from a small treatment owned by one small scale producer, generally the cost of water changes with season.

In Kisumu average expenditure on water for all sources combined amounts to 12.2-16.3% of the monthly income of poor households in the wet season and 21.4-28.5% in the dry season. When considered separately, expenditure on well water was the least

and the data shows that if only using well water, low income households would spend an average of 4.7-6.3% and 15.8-21.0% of their monthly earnings in the wet season and dry season respectively. Expenditure on handcart vended water both during the wet season and dry season was high with that of the dry season rising to 50-66.7% of monthly incomes of poor households but poor households use handcarts rarely. Expenditure on water from the independent small scale producer takes about 5.9-12.5% of the total income of poor households. The expenditure on water for poor households is slightly higher than what households spend on house rents.

TABLE I
RESULTS OF THERMOTOLERANT COLIFORMS PRESENCE

Water sources	N	Positive TTC detects (%)		
		Combined	Kisumu	Addis Ababa
All samples	414	73.7	84	40.2
Tap (standpipes/house taps)	81	23.5	26.1	20
Well	98	96.9	96.9	100*
Handcart container	39	69.2	69.2	-
Household storage	184	86.4	100	51.9
Borehole	6	66.7	50	50

D. Quality of Water in Addis Ababa and Kisumu

The quality of water from various sources used in the case study areas was analyzed with respect to the presence of thermo tolerant coliforms as indicators of fecal contamination and hygiene. In addition, nitrates and fluoride were also determined in groundwater sources.

The quality of water from various sources used in the case study areas was analyzed with respect to the presence of thermotolerant coliforms as indicators of fecal contamination and hygiene. In Both Kisumu and Addis Ababa the standards for microbiological quality of drinking water is that given in WHO Guidelines for Drinking Water Quality: a zero presence of coliforms in a 100ml sample of drinking water and ≤ 50 cfu/100ml standard for untreated community water sources by the case study countries. There is a suggested relaxed guideline value: $\leq 10/100$ ml for piped water which cannot meet the current high standard for piped water. Seventy four percent of all samples (from various sources) analyzed for thermotolerant coliforms were positive for thermotolerant coliforms. Overall more samples from Kisumu were positive for thermotolerant coliforms than in Addis Ababa as summarized in Table 1. Piped water collected from public water taps/standpipes had better microbiological quality than other sources. However, compliance rate was higher in Addis Ababa (80%) than in Kisumu (73.9%) but the difference was not statistically significant.

Although samples from boreholes from both cities were few, where thermotolerant coliforms were found majority complied with the relaxed guideline value ($\leq 10/100$ ml) and also with (≤ 50 cfu/100 ml) standards for untreated community water sources by the case study countries. There were few samples from tanker trucks, borehole and springs. No sample from tanker trucks had thermotolerant coliforms. Levels of thermotolerant coliforms contamination in samples from springs and borehole were low. All samples from households in Kisumu (Table 1) had presence of thermotolerant coliforms compared to 51.9% for

Addis Ababa and the levels of thermotolerant coliforms were much higher in Kisumu and significantly different from Addis Ababa. In Kisumu, water obtained from wells and stored in the house had significantly higher levels of thermotolerant coliforms than tap water stored in the house suggesting influence of source quality on household water. Household water quality was significantly different from well and handcart.

Analysis of microbiological quality along the supply chains for water from different sources indicates that there was no significant difference between tap and well water sampled at the source (public water tap/standpipe) and that in the handcart container. This suggests that deterioration in quality may not occur during transportation by handcarts and tankers and that transportation by handcarts or tankers does not lead to deterioration in the quality of water. This suggests that handcarts are able to maintain relatively good water quality up to the point of delivery. This could be due to the short time taken to collect and transport water to customers or good hygiene practices. However, this may not be the case always. Deterioration in quality for tap water occurs within the household. Comparison of the source water and water stored in the house shows that deterioration in water quality can occur once transportation and storage in the home is undertaken. This is demonstrated by the deterioration of the quality of tap water as it is stored in the house (compared to quality at source). Poor hygiene practices related to water transport and/or storage can lead to good quality source water becoming contaminated at the household level.

Nitrates and fluoride levels in ground water sources were also determined. The failure rate was lower than for thermotolerant coliforms. For fluoride, the standards value for Kenya is 1.5 mg/l which is the same as that given by WHO; while Ethiopia gives 3.0 mg/l. Fluoride concentration for the water samples analyzed range from less than 0.5 mg/l to 13 mg/l. Kisumu had higher concentration reaching up to a maximum of 13 mg/l while samples from Addis Ababa had very low concentrations. All the samples from Addis Ababa and the majority from Kisumu (71.5%) were within the recommended guideline value for fluoride (≤ 1.5 mg/l). For Addis Ababa all the samples were, therefore, also within the country standard set at 3.0 mg/l).

For nitrates the WHO guideline value for nitrate is 50 mg/l as NO_3 (11.3 mg/l $\text{NO}_3\text{-N}$ for nitrate as nitrogen), which is the standard adopted by Ethiopia, but Kenya gives a maximum of 10 mg/l. Nitrate concentration (Nitrate as Nitrogen $\text{NO}_3\text{-N}$) for the water samples analyzed range from a minimum of <0.1 mg/l up to 45 mg/l. Kisumu had the highest

concentration reaching up to the maximum of 45 mg/l while samples from Addis Ababa had very low concentrations. Overall the majority of the samples (71.1%) in Kisumu and all the samples from Addis Ababa were within the guideline (≤ 11.3 mg/l) suggested by WHO and also the standard used by Ethiopia. For Kisumu the majority (62.7%) of samples were also within the Kenya standard of ≤ 10 mg/l, which was slightly stricter than the WHO guideline value.

III. THE LEGAL STATUS OF SIPS IN ETHIOPIA

Ethiopia is a federal state [29]. Powers and functions relating to the management of water resources in general and supply of water and sanitation services in particular are divided among the federal government and constituent units of the federation (also called regional states). The federal government is constitutionally charged with formulating the legal framework according to which regional governments manage water resources found exclusively in their territory [29]. Administration of water bodies which connect or cross two or more regional states is, however, the responsibility of the federal government [29]. Since many of the rivers are of such a nature, this implies a very limited role for regional governments.

Water is publicly owned and hence individuals generally acquire the right to abstract and use water through the permit system [30]. The federal government enacted the Water Resources Management Proclamation in 2000. (The term 'Proclamation' refers to a statute that is enacted by the main legislature in Ethiopia just like the term 'Act' is used in other legal systems). The Proclamation provides that, "...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 use or for others; (c) transfer water which he/she abstracted from a water resource or received from another supplier*". There are some activities which are exempted from this requirement but none seem relevant to SIPs. Digging water wells by hand or using water from hand-dug wells; and using water for traditional irrigation, artisan mining and for traditional animal rearing, as well as for water mills are exempted from the permit requirement [30].

There is no framework law that provides if and under what conditions the private sector can be involved in the supply of water and sanitation services. The only rule is the above provision in the Water Proclamation which requires permit to supply water services. What preconditions must be fulfilled to be able to get this permit is not clear from the

Proclamation. The Council of Ministers and the Ministry of Water are expected to enact secondary legislation setting out the preconditions of and the conditions attached to the permit to supply water. So far, however, none of these secondary lawmaking organs have come up with such law.

The federal government has set the water safety standards which are basically based on the WHO guidelines [31]. However there are no effective mechanisms of enforcing such standards. As far as safety of water is concerned, AAWSA is expected to comply with these water quality standards. However, there are no procedures for monitoring if these standards are being met. The standards are not also accompanied by specific sanctions. AAWSA has an in-built system to ensure the safety of drinking water; it daily takes samples from different areas of the city and tests the water for contaminants. But these are not reported to any outside body and are useful for purposes internal to the authority. There are no safety standards that are specifically applicable to the activities of SIPs.

There is no national regulatory framework applicable to urban water supply across the country. In Addis Ababa, the legislative branch of the city government has the power to determine the tariff structure [24], [32]. Price determination is a political issue; if there is any control on how price is determined, it is only a political one. The current tariff which is used was supposed to expire on 7 July 2007 [24]. However, it is still in use as the city government has not been willing to accept the revision requested by AAWSA. The price charged by the different forms of SIPs is not currently controlled. The tariff binds only AAWSA. Public fountains are charged a flat-rate as they are expected to serve many households. This tariff structure, however, discourages households from sharing connections or selling to others; if they do, since they are likely to be considered high-volume users, they would heavily charged.

The federal law requires a permit for the supply of water for domestic and other purposes [30]. But when it comes to Addis Ababa this permit is unlikely to be granted as the law which has re-established AAWSA clearly prohibits supply of water or resale of water [24]. However there is an exception to this. Standpipes, or what are called public fountains by the law, can be operated with the agreement of AAWSA [24].

Apart from standpipes licensed by the authority, there are also water kiosks and neighbor sellers. Clearly these are operating in contravention of the legal prohibition. However, this prohibition is rarely enforced. But the tariff structure which is employed by AAWSA is supposed to discourage resale of

water: with the exception of public fountains, a progressive rate is applied. However, the effect of this progressive rate as opposed to preventing resale water has merely made water more expensive to the urban poor who are inadequately served.

IV. THE LEGAL STATUS OF SIPs IN KENYA

The Kenyan Water Sector has recently undergone a 'fundamental reform' introduced through the Water Act 2002 which came into force on the 18 March 2003 [33]-[38]. Among others, issues of water supply and sewerage services have been separated from the wider issues of water resources management [25], [26].

Water is publicly owned and hence individuals generally acquire the right to abstract and use water through the permit system the general nature of which is outlined in the Water Act and the details of which are provided in a secondary legislation [39]. The Water Resources Management Authority (WRMA) has the power to issue, monitor and revoke water use permits [26]. It has regional offices the jurisdiction of which corresponds to the major catchments [25].

There is no single national agency that is charged with the responsibility of supplying water and sewerage services in the country. Pursuant to the Water Act, seven Water Services Boards (WSBs) have been established with the responsibility to develop and own water supply and sewerage infrastructure in their respective service areas. The boundaries of the service areas of the WSBs correspond to the boundaries of the major catchments. The WSBs are licensed to provide water services and their activities are regulated by a national regulatory agency, Water Services Regulatory Board (WSRB) [26]. WSBs are required to engage the services of WSPs to operate the water supply system and provide water and sewerage services in certain defined areas within their service area [26].

The WSRB, among other things, is also entitled to approve tariffs used by WSBs [26]. In addition, it approves any service provision agreement made between WSBs and WSPs and its subsequent amendments [26]. The WSRB is also empowered to determine standards for the provision of water services to consumers [26]. It is not immediately clear if this includes water safety standards. The current water safety standards in the country are however formulated by the Kenya Bureau of Standards and are incorporated in the service provision agreement between, for example KIWASCO and LVSWSB which also contains financial penalties for non-compliance [28].

The Water Act does not contain any provision that expressly deals with SIPs. However, it provides:

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 litres of water a day for domestic purposes; or (ii) more than one hundred thousand litres 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.

If a person supplies water below twenty households and twenty-five thousand liters per day, he would not commit the offence. Similarly, a person could continue to supply water to any number of people and any amount of water daily as long as they made an agreement with the relevant WSB and this agreement is approved by the WSRB. One of the requirements provided in the Water Act regarding WSPs is that they must be constituted as a separate entity exclusively for the purpose of providing water [26].

According to the national legal framework, WSBs have the monopoly for the supply of water services in their area of service. The problem with this legal provision is that it does not admit any exceptions regarding areas over which it has legal but not physical competence; this is without overlooking the limited recognition of SIPs

Coming to the case of Kisumu, it should be noted that almost all of the borehole and well operators and mobile water vendors are operating illegally. This is because they exceed the limit provided in the Water Act and that they have not concluded a service provision agreement with the LVSWSB:

- A typical handcart pusher supplies 240 liters of water per trip and when business is good, he/she can make up to 15 trips per day. Thus, a handcart pusher can supply up to 3600 liters of water per day and is in no danger of contravening the maximum volumetric limit set in the Water Act. However, a typical handcart operator is likely to sell to considerably more than 20 households a day during busy periods. That means such operator needs to have a service provision agreement.
- A tanker trucker can deliver 10,000 liters per trip. Thus, to remain below the threshold in the Water Act, a tanker trucker may make no more than two trips per day if supplying domestic users. Currently the average number of trips per day is approximately five, thus delivering approximately 50,000 liters of water a day. Most of those trips are to supply hotels, factories and construction firms. Some of these could, therefore, be

considered non-domestic uses and hence a tanker trucker could lawfully provide up to 100,000 liters so long as it does not supply more than 20 households.

- Source operators such as borehole and well operators too are constrained by the limits imposed in the Water Act. They supply households directly and indirectly through mobile vendors such as handcart operators and tanker truckers. A source operator cannot legally provide water even to one handcart operator as it might serve more than 20 households. They are also likely to exceed the volumetric constraints of the Water Act.

Attempts have been made by LVSWSB to register and offer service provision agreement to well-owners and borehole operators. But it has not been effective. The initiative to register the existing well-owners and borehole-operators by LVSWSB and KIWASCO had the expressed objective of identifying them for future support and facilitating intervention measures during public health emergencies. This is not, however, an initiative in which SIPs have trust; they suspect that the registration is a mere precursor to their closure. They do not also believe in the legitimacy of the power of these recent government institutions to police well and borehole operators which have been in existence for longer period of time. Finally, the measure of registration and the notion of signing a service provision agreement are not favorably seen because it involves a duty on the part of SIPs to pay a certain percentage of their turnover as a licensing fee to the LVSWSB. Most importantly, the registration initiative is being implemented by KIWASCO rather than LVSWSB. This apparently raises an issue of conflict of interests.

Only standpipe operators, operators in a delegated management model and Nyamasaria Water Works are currently officially recognized.

It should also be noted that currently the price and quality of water provided by those SIPs illegally operating and also those officially recognized are not regulated. The exceptions to this are those standpipe operators, who have contractual relationship with KIWASCO which are expected to adhere to the prescribed retail price which is not being actively enforced. Nyamasaria water is tested occasionally by Kenya Bureau of Standards.

V. IS THERE A NEED TO REGULATE SIPs?

A. Regulation in General

The task of 'defining regulation is by no means a simple matter' and yet the literature on the subject is filled with several such attempts on which there is no

recognizable consensus [40]. For the purpose of the discussion at hand, regulation can be defined as “the promulgation of rules by government accompanied by mechanisms for monitoring and enforcement, usually assumed to be performed through a specialist public agency” [41], [42]. This can be refined further by excluding certain rules which are non-regulatory in the sense that they are meant to merely facilitate or organize human behavior rather than limit it in a bid to achieve public purposes [43].

Water utilities are subject to various regulatory standards pursuing economic, social and environmental objectives [44]. In many cases, water utilities are regulated by different agencies: one agency regulating the price, quality of service and investment levels; another regulating the quality of water and yet another regulating the environmental impact their activities [44].

There are two alternative general approaches that the law might possibly take with respect to the small-scale water provision and providers. First, the law could positively recognize them (or rather not prohibit them) without putting any licensing requirements and standards of conduct and output. That means any person can at any time anywhere abstract any water and sell it for any price to any person and for any kind of purpose. Second, the law could decide to regulate them. Regulation basically involves restricting the freedom of SIPs by imposing entry, conduct and product requirements. For example, SIPs might be allowed to operate by first securing license for abstraction and supply of water. Or they might be required not to sell water beyond a certain maximum limit. This is the situation in Kenya where the law states that anyone who intends to supply more than a specified volume of water or number of households should do it only on the basis of service provision agreement. This limitation of freedom might go to the extent of no freedom as when SIPs are prohibited from supplying water.

Taken this way, therefore, SIPs are currently subject to regulatory controls in Addis Ababa and Kisumu, though these regulatory controls are seldom enforced. But the real questions are whether they should have been regulated and if they should, what is appropriate level and form of regulation.

In what way should the law regulate SIPs is a second-order question. The first-order question is: whether the freedom of SIPs should be restricted in any way? Or is there any *prima facie* case of regulation? It is *prima facie* because any need for regulation identified at this stage is merely a tentative conclusion which could be abandoned if there are not any cost-effective ways of regulation [45]. Separating the two questions is essential as it helps to avoid

instituting costly regulatory measures which are not necessary [45], [46].

There are two principal theories of regulation: public interest and private interest theories [42], [43], [47]. When the per capita benefit of regulation is small, individuals have minimal incentive to organize for the purpose of maintaining or realizing favorable regulatory terms. In such cases, the government could easily be ‘captured’ and made to serve the interests of few private economic actors. Private interest analysis can be invoked to explain regulation in those circumstances where its assumptions and premises are true and no other explanation exists. However, it could not be cited as a general theory of regulation. Setting aside the distinction between general and specific theory, private interest analysis has one significant contribution. That is, it can be used to formulate procedural safeguards against regulatory capture [46]-[48].

The general justifications put forward and found in the literature are of two kinds: economic and non-economic [42] [43]. The economic justifications refer to instances of market failures. The typical argument runs as follows: markets result in allocation of resources to the most productive uses and users. The market relies on prices to achieve this. For this expected benefit of the market to materialize, there are certain conditions that must be fulfilled. For example, a given market should consist of so many buyers and sellers who, taken individually, are not significant to influence output or price. Efficient market requires also that price fully capture the full cost of production which includes private cost and social cost. However, the reality of markets of different goods and services and in different places is not exactly the same as the ideal market. One or more of the preconditions are found lacking in many markets producing what are called market failures. So market failures supply one set of justifications for the intervention of the government in the market. Equity and paternalistic considerations are other reasons of regulation.

B. Regulation of the Price of Water Services

Water utilities are subject to economic regulation which involves, among others, control of the price consumers pay. The existence of natural monopoly is the market failure that is cited to justify regulation of price. One response is to regulate competition with a view to prevent the formation of monopolies [49]. However, the formation of monopolies might be desirable and in some ways unavoidable—the case of natural monopolies [42], [43], [45], [49], [50]. In such cases, attempts should be made to regulate price. This is a general argument in favor of regulation of prices. However, economists argue that the existence of natural monopoly by itself is no good reason for

regulation. The case for regulation becomes stronger where the demand of the commodity is not highly sensitive to price changes. It is in such cases that the natural monopoly is expected to behave in inefficiently manner by increasing price and decreasing output [45].

Likewise, the price of water should be regulated because the market for the supply of water and sewerage services is said to be a natural monopoly [44], [49]. Supply of water services involves three distinct processes: production, distribution and retail [49].

The distribution aspects of the water supply exhibit more attributes of natural monopoly than other public utilities such as electricity and gas: among others, high capital intensity, the need to have excess capital, and low marginal cost of transporting additional water [49], [51]. There is some doubt as to whether competition in the supply of water services is possible among producers of water just like there is a competition among generators of electricity. In the regulation of water companies in England and Wales, for example, the economic regulator is also charged with promotion of competition among existing companies under certain conditions. However, it is generally accepted that competition among companies in the production of water raises some complex regulatory issues regarding quality and access to common carriage [52], [53]. Robinson identifies four challenges of introducing competition into the water [54]. First, he states that there might be significant public objections to a permission to develop new water supply sources [54]. Second, high costs of transporting water long distance have precluded the development of a national grid of water distribution as opposed to gas and electricity and this further limits the practicality of competition in water [54]. Third, mixing water in a common network raises question as to the responsibility of each producer for failure to meet water quality standards [54]. Fourth, related to the third challenge, the separation of economic and social regulators complicates the challenge of introducing competition into the water sector [54]. If common carriage is to be used, it requires that all water consumers are metered and in a situation where many households pay a flat rate, introducing competition would be challenging [54]. Robinson admits that these challenges are not insurmountable and argues in favor of introducing competition through inset appointment, cross-border competition, or requiring open access on regulated terms or separating the ownership of the distribution infrastructure. Perhaps the strongest argument which is not mentioned by Robinson is that competition precludes the use of cross-subsidies as a tool to make the price of water affordable to certain sections of the

population by allowing high-volume water users to be able to switch or self-supply. It should be noted in this connection, though incidentally, that the values of introducing competition into the water sector might be a justification to allow the operation of SIPs which do not raise any issue of how to regulate common carriage and mixing of water from different sources.

The natural monopoly characteristics of the water sector therefore justified economic regulation of water utilities. One task of economic regulation involves setting the price of water based on the cost of its production, distribution and disposal. By basing the price on the cost of water, the objective is to avoid both overproduction (consumption) and production (consumption) of water services [51]. So long as regulation is solely concerned with ensuring efficient utilization of resources, its mission is to mimic a competitive market and set a price which would have prevailed had it been possible and desirable to have a competitive market [55]. The result of this might be, however, a price which may not be affordable to some section of the society, people for whom the price is expensive and hence would have bought more of it had it been cheaper. There will be at the same time people for whom the price is cheaper for whom the price is not expensive and hence would have bought the same even if the price is higher.

That regulation is concerned largely with attaining efficiency might be true in most cases. But it should be pointed out that there are other values such as equity that undercut public policy. Hence price regulation should also be about ensuring equitable outcomes. Once it is accepted that price regulation should also be concerned with equitable outcomes, it follows that it might be necessary to set the price at a level which is below that which would have prevailed in a competitive market (below marginal cost). By doing that attempts could be made to make it affordable to all or at least to the greatest section of the population; so that they would be able to buy more of it than they would have done otherwise. Therefore, making the prices of water services affordable is also another objective of economic regulation.

A number of reasons could be provided to explain why regulation should also be concerned with making water affordable. Affordability has implications on public health as well as the sustainability of the whole water supply systems. So it appears in the public interest and in some ways also in the interest of water providers that water services are affordable.

If water services are not affordable, then it means that some people would have less of it than that which is strictly required to lead a healthy life. The result may be a spill-over effect in the public health system.

Expensive water means not only less water but also less of any other necessities of life [51], [56].

There are a number of policy tools that can be used towards making water services affordable to the largest section of the population [56]. The first and which is often preferred by economists and consumer associations is direct governmental subsidy to make up for the difference between what a customer affords to pay the water company and what it costs the water company to serve that particular customer [57]. This is a non-regulatory solution and in this the water provider is merely a cooperating partner of the government. The following are some of the regulatory tools.

One of the regulatory tools involves setting a tariff structure that allows and requires cross-subsidization and prohibiting water resale or self-supply and legally recognizing monopoly in order to make the program of cross-subsidization effective. In addition, adopting regulatory requirements that help to minimize the costs of the water supply system will go a long way towards making water affordable. This includes adoption of an appropriate mechanism of price regulation. For example, rate-of-return approach to price regulation does not provide the right incentive to use the efficient level of capital; on the contrary it encourages water companies to 'gold-plate' the supply system and hence increasing the problems associated with affordability [58], [59]. Setting a standard on the minimum proportion of the bill that should be collected as more bills are collected means the price would be lower. The regulator should regulate the quality and performance of the distribution system to reduce the level of water unaccounted for.

Considering the structure of the market for small-scale water provision and the nature of providers, the question now is whether the above discussion leads to regulation of price. When it comes to SIPs, the first point that should be noted is the fact that they follow a different kind of business model. First of all, the market is characterized by little or no sunk cost. The kinds of SIPs that currently operate in the case study areas have been described earlier. Mobile vendors such as hand-cart pushers serve as 'virtual pipelines' overcoming the huge sunk cost involved. The same is true with respect to small-scale water production. Second, they operate in competition with one another. The fact that these form of providers have emerged in the water supply sector is also one good reason to suspect that the water supply sector is not in fact a natural monopoly in some cases.

There is no problem of natural monopoly in small-scale water supply market. It is on the basis of this that some have argued against price regulation [10], [60]. However, the studies of water prices in the case

studies show that there are serious problems of affordability in Addis Ababa and Kisumu. But these problems cannot be solved or minimized using price regulation.

Therefore, it can be concluded that there is no prima facie case for price regulation as far as SIPs are concerned for two reasons. First, the market for small-scale water provision is not a natural monopoly. Second, price regulation of SIPs does not solve the problems of affordability.

C. Regulation of the Safety of Water

Conventional water utilities are subject not only to price but also safety regulation. There would often be a separate regulatory agency charged with the task of developing water quality standards and ensuring that water utilities comply with these standards. Regulation of the quality of a monopoly service or product can be justified on the basis of natural monopoly as a market failure. Natural monopoly gives the producer unfettered market powers to not only set the prices but also determine the quality of the product. The monopoly would not have any incentive to improve the quality of its product particularly when the product is an essential product and there are no alternatives. The incentive of the monopoly to improve quality is more diluted when it is subject to a price-cap regulation [61], [62]. Therefore, just in the same way that regulators are concerned with price, they should also be concerned with the quality of the product or the service. It has already been explained in the previous section that the conventional market for the supply of water services is a natural monopoly. Therefore, regulators should set not only the price but also the quality of water provided by conventional water utilities.

If this was the only justification for regulating the quality of drinking water, the following would have been the natural outcomes. First, the same agency that regulates prices would also do quality. The quality of water services has two dimensions. The first dimension is the quality of customer interface. This involves setting standards regarding, for example, handling of customer complaints, water pressure, procedures for repair, connection or disconnection and enforcement of such standards. To this extent it is true that the same organ that regulates price is often endowed with powers to regulate quality. The second dimension is the quality of the water itself. This involves setting and enforcing microbiological, chemical and physical attributes that drinking water should possess. To the extent this is so, the above outcome does not reflect the reality in many countries where economic regulators are not directly involved in the setting and enforcing of microbiological, chemical and physical standards.

Second, since, as it is stated in the previous section and also confirmed in the case studies, small-scale water provision is a competitive market, there would be no need to be concerned with the quality of drinking water by SIPs.

There are some who followed the second line of reasoning and who argued that there is no need to be concerned about the quality of water provided by SIPs. In its Field Note on SIPs in Manila, the Water and Sanitation Program of the World Bank took account of the issue of whether consumers found it safe to drink or not [4]. The fact that the majority of the customers have found the water drinkable is not an adequate ground to rule out the possibility of regulating the safety of water. Often it is the case that safety and public perceptions of safety do not coincide. McIntosh also makes the same point: "to a large extent, the market promotes regulation through customer choice concerning price and quality of water" [8]. Such lines of arguments are based on premises that, as long as there are many buyers and sellers in a market each too small to influence the market outcome and so long as there are no significant entry and exit barriers, there is no need to control the quality of goods and service. This is not however necessarily true.

Markets result in efficient outcome when, among other things, the participating economic actor have sufficient information required for making informed decisions [63]. Markets leave the power of decision-making to individual economic units on the assumption that they will make the best choice for themselves and the society. Making such decisions requires sufficient information. The problem with certain markets is that the required information is not available or is difficult to discover or comprehend. Even if there is a possibility for a separate market that supplies the required information to emerge, such market by itself is pervaded with problems of incentives. Information has a public good nature with characteristics of non-excludability and non-rivalry resulting in diminished incentives for individuals to be involved in its production and dissemination compared to other economic goods [64]. When the problem of information is manifested in the form of a buyer having inferior information regarding the quality of a product in comparison to what the seller has, it is argued that this will result in the continued deterioration of quality.

Akerlof argued the market for second-hand cars is not always efficient [65]. It is surrounded uncertainty generated by information asymmetry, unequal information between buyers and sellers. The owner-seller knows the real quality of his car. The buyer does not have that advantage. All he knows is the car may be either very good or 'lemon'. Faced with this

uncertainty, the buyer is willing to pay only an average price. Those who believe their car is worth more than the average price would leave the market. Only those who have cars worth less than the average price remain in the market. This process will continue until only 'lemon' cars remain in the market. The bad cars would drive the good cars out of the market.

Further researches in the field of economics and marketing have refined this hypothesis. Now the accepted view is that the market itself would take care of the problem of information asymmetry. And it is only when the information asymmetry relates to the experience (in some cases) and credence (in most cases) attributes of a product or service that regulatory response is justified.

The quality attributes of a product are of three types: search, experience and credence [63], [66]-[68]. Search attributes are those which can be ascertained (assessed) prior to purchase. On the other hand, experience attributes are those attributes of a product which cannot be assessed prior to purchase; however, it can accurately be assessed after purchase and experiencing the product. There are attributes of a product which cannot be known even after purchase; these are known as credence attributes. A given product may have all search, experience and credence attributes [69]. For some goods, the attribute that is most relevant may be its credence or experience attribute. Which attribute is most important in the decision to purchase depends on the preference of a particular consumer. These are also attributes of services. Compared to goods, it is believed that many of the quality attributes of services are characterized as credence attributes [70].

The ramifications of information asymmetry and the appropriate response turn on the form of attribute over which there is unequal information between the contracting parties. Assuming the information asymmetry affects the search attribute of a product and it is the search attribute that is considered significant by consumers, does this result in a 'lemon' market as suggested by Akerlof? Information asymmetry affecting only the search attribute of a problem can be overcome by spending some amount of time and money. The buyer could pay a mechanic to check the car on his behalf. Or the buyer could spend some time examining the physical attributes of the car or checking other dealers and so on. Advertisements are also explained as a way of minimizing search costs by informing consumers of the existence and price of a product [71]. Information asymmetry affecting search attributes do not, therefore, pose significant problem as they can easily be overcome by buyers. The widely accepted legal maxim, buyers beware, can therefore be justified with respect to search attributes.

How about experience attributes? Experience attributes by definition, as stated above, are those which can be known after purchase and consumption. Whether a product possesses the requisite attribute will be known after the first consumption. The question here is whether information asymmetry affecting experience attributes of a product would result in a lemon market as suggested by Akerlof? The answer is not necessarily. This is because of a number of reasons.

If a product is one which is frequently purchased, the seller will have the incentive to produce a product which possesses the requisite experience attribute, for buyers would punish it by opting for an alternative. With respect to such products, therefore, it can be observed that the market is a self-correcting institution. The problems are more pronounced in the case of durable products which are not frequently purchased. Even then, brand names and reputation operate to minimize problems of information asymmetry in experience attributes [69], [72], [73]. To some extent also it is in the interest of the producers (sellers) to provide some pre-sale information regarding experience attributes. Free samples and test products could be explained as a way of overcoming information asymmetry. The problem with attributes which cannot be examined before purchase is that consumers would not be willing to pay for them and hence it would be in the interest of producers to do as much as possible provide such pre-sale information and through that develop willingness to pay on the part of the consumers. Advertisements play an important role. For durable products, after-sale services and warranties by sellers increase the willingness of consumers to pay for alleged experience attributes [71].

The problem of information asymmetry is more pronounced in the case of credence attributes, those which cannot be verified even after purchase and consumption. In such cases, it is possible for Akerlof's 'lemon' market to emerge. If consumers are not able to verify whether or not a product or service possesses a certain desirable credence attribute, then they will not be willing to pay for it. It also means that the producers would not have any incentive to incur costs to improve the credence attribute of a product. When the really important attribute of a product cannot be verified before and after consumption, consumers tend to make a decision taking the search and experience attributes as a proxy [70].

This finding has an important implication. If consumers take physical appearance which is a search attribute as a proxy for experience attributes or search and experience attributes as a proxy for credence

attributes, producers would have an incentive to spend greater than optimal amount of resources into perfecting the search and experience attributes.

There is a strong case for regulation of quality when there is great deal of information asymmetry with respect to the credence attributes of a product or service. This is the main public interest explanation for quality (safety) regulation and consumer protection even in markets where there is a great deal of competition. This argument applies in a range of markets.

Coming to the market for the supply of water services, in particular the market for the supply of drinking water, the fact that it is a natural monopoly justifies regulation of not only price but also quality. Regulation of the quality of drinking water is also required even when the market is characterized by competition. In other words, competition among waters service providers does not necessarily result in improved (safe) drinking water. On the contrary, considering the fact that the most relevant safety attributes of drinking water are credence attributes, that they cannot be confirmed even after purchase and consumption, one might reasonably expect a 'lemon' market (or literally a market of dangerous waters).

SIPs operate in competition with one another. Competition in this respect has two aspects: price and quality. Price competition involves lowering the price which is a good thing for consumers. Competition on quality of water should encourage them to improve the quality of water. Improving the quality of water has the effect of raising the price of water as doing so requires investments in the treatment of water and protection of sources from contaminants which ultimately add up to increase the price the consumer is expected to pay. The advantage is: by improving water quality (assuming the price of alternatives is constant), one could expect to get additional customers if the improved quality is appreciable and the increased price because of the improved quality does not exceed what customers are willing to pay. But the willingness to pay of customers depend on whether they can tell, by simple inspection of water for the improvement of which the provider has invested a certain amount, that provider's allegation about quality is true. That means consumers are expected to be willing to pay a certain premium which corresponds to the improved quality as observed by color, taste or smell. The consequence of this is that SIPs, even in cases of competition among themselves on quality, are expected by economic rationale to invest only in improving the color, sell and taste of water they are selling.

This has four potential consequences. First, there would not be real meaningful investments in enhancing and treating or care in maintaining the

chemical and microbiological quality of water. Second, there would be inefficient investment in improving the physical quality of the water—flavoring and dyeing it in different colors and tastes. Third, worse cases, they would resort to measures that would cause the deterioration of the chemical and microbiological quality of the water while making it smell, taste and look better. Fourth, even the optimal level of investment for enhancing the physical quality of water is not guaranteed as the price of competitors does not necessarily remain constant. When one provider invests that level of effort and capital on physical attributes of its water that the consumers are willing to pay in the form of increased price, the other providers would lower their price making sure that the difference between your price and theirs will be high enough to influence customers to choose theirs. Even if you have invested optimal amount of effort and money to improve the physical attributes of the water and even if that is appreciated by customers, the difference between ones' price and that of the competitors no more corresponds to what customers are willing to pay.

The problem emanates because of the difficulty of determining the quality of water. The physical qualities are its search and experience attributes and the chemical and microbiological qualities are its credence attributes. As far as safety of drinking water is concerned, the most important are its microbiological and chemical qualities. However, consumers would be able to easily determine whether given water is safe chemically and microbiologically. As a result they would rely on its physical attributes as proxies and that would have undesirable consequences. That consumers would routinely use physical attributes is also confirmed in some surveys measuring consumers' perception of safety.

One would argue that insufficient information by itself is not important since the market will be able to correct this by itself. For example, in frequently purchased products and services information asymmetry with respect to its experience attribute is not a problem as the buyer would soon ascertain if the product possesses the requisite experience attribute and would punish or reward the seller depending on the outcome. The problem as far as safety of water is concerned is that even if it is a frequently purchased product, the real attributes that matter from health perspective are also credence attributes and hence the market would not self-correct in the above sense.

The efficiency-based public interest case for regulating the quality of water provided by SIPs is also supported by the spill-over effects of consuming unsafe water. Water borne diseases impose significant costs on the public health system and the general economy. That means the effect is not restricted to

the person who has consumed unsafe water. This strengthens the public interest case for control. The public health implications of the safety of water has in certain cases resulted in court order requiring connection to public water supply even when the individual concerned does not want it [74].

But not least there are also equity concerns surrounding the safety of drinking water. Poor households, as the largest category of SIPs customers, are also the prime victims of the adverse health ramifications. In conclusion, therefore, it can be said that there is a strong *prima facie* public interest case for control of SIPs with the objective of ensuring that the water they are providing is safe to drink.

Market failures such as information asymmetries and externalities are strong grounds for regulation when they are accompanied by private law failures. The relevant private law in the case of water resulting in adverse health effects is tort law. If tort law works perfectly, one would expect that the threat of being liable to pay damages provides adequate incentives to providers with respect to the quality of water. However, tort law does not always work perfectly. Tort law is not adequate when potential defendants are not able to pay full the damage they are made liable to pay. In this regard, the relative size of the asset of the defendant compared to the probable magnitude of harm is important. In the case of SIPs, their assets compared to the public health risk they pose are negligible and hence tort law cannot provide adequate incentives. In addition, difficulties of proving causation and identifying the particular SIP responsible for the harm would dull the deterrent edge of tort law.

The above need for regulation of the quality of water provided by SIPs is bolstered by key findings of the water quality studies. It is found that the quality of water, from sources other than the official provider in Kisumu mainly, well-owners is unsatisfactory. Well-owners allege that they invest in technologies of water treatment. This is not verifiable nor is there a guarantee that such technologies are consistently used. In addition, standpipe operators in Kisumu express their concern that mobile vendors source water from wells and boreholes and sell it as if it was from standpipes. The standpipe operators are obviously concerned because they are losing their competitive advantage. But this point, most importantly, underscores the inability of consumers to discriminate between mobile vendors based on the safety of water they are providing.

It is also found out from the water quality study that there is not significant deterioration in the quality of water during transportation. This concerns mobile water vendors. This might be explained by the short period of time for which the water is transported. But

most importantly, it might have to do with the fact that mobile vendors take measures that would maintain the quality of their water (washing of their jerry cans)—the purpose is to market their water rather than being concerned with the safety of the water per se. Such mobile vendors cannot afford to ignore the cleanness of their jerry cans as it can easily be picked up by potential buyers. At the same time, it might be mentioned here that black

VI. THE RIGHT TO WATER: TRANSFORMING THE NEED INTO AN OBLIGATION TO REGULATE

A. Introduction

Individuals in Ethiopia and Kenya have the human right to water which is generally based on the International Bill of Rights and their interpretation. There are also other international human rights instruments specifically dealing with the right to water, albeit with respect to specified groups such as children. Whether the right to water is a derivative or a stand-alone right is debatable. The extent of entitlement it confers on individuals and the extent to which it is justiciable are also fraught with controversies. However, at a minimum, it requires the government to establish a regulatory framework that has the objective of ensuring that water services provided by third parties such as SIPs are safe and affordable. Therefore, the human right to water requires governments in Ethiopia and Kenya to set up a legal framework for the regulation of SIPs and such duty to regulate arises when there is a need to regulate. The extent of the need to regulate SIPs has already been discussed and the right to water transforms this need into a legal obligation.

B. The Human Right to Water in International Human Rights Law

The first human rights instrument to expressly mention water is the Convention on the Elimination of All Forms of Discrimination Against Women 1979 [75]. Article 14(2) of this convention states that “States Parties shall take all appropriate measures to eliminate discrimination in order to ensure, on a basis of equality of men and women, that they participate in and benefit from rural development and, in particular, shall ensure to such women the right...to enjoy adequate living conditions, particularly in relation to...sanitation...and water supply”. This might be explained on the basis that lack of adequate water supply and sanitation services has huge burden on women [76], [77].

The second and only other binding instrument of international human rights to explicitly state water is the Convention on the Rights of the Child [78]. Considering the particular impact of poor water services on infant and child mortality, Article 24 of

this instrument obliges States Parties to take measures to “combat disease and malnutrition, including within the framework of primary health care, through, inter alia, the application of readily available technology and through the provision of adequate nutritious foods and clean drinking-water, taking into consideration the dangers and risks of environmental pollution”.

Even if these two international human rights instruments explicitly mention water, they are flawed in many ways. First, they are not comprehensive; for example, in the case of the latter, the emphasis is on the quality (safety) aspects of water [79]. And both of the conventions do not provide any additional clarification on the scope of the right and the corresponding obligations [79].

The three instruments which together constitute the International Bill of Human Rights, the Universal Declaration of Human Rights, the International Covenant on Civil and Political Rights (ICCPRs), and the International Covenant on Economic, Social and Cultural Rights (ICESCRs), do not contain any specific and explicit reference to the right to water [80]-[82]. This does not, however, mean that the drafters have opted against recognizing water as a human right. The failure of the draftsmen of the Bill of Human Rights to explicitly recognize water as a right could be interpreted in two ways. First it could be the case that the drafters have considered water so fundamental that there was no need for explicitly provision [83]. Or that they had not ‘realised that water was to be such a scarce resource in the future’, and the idea is to read the right to water into any of the explicitly recognized rights such as the right to life, health, to adequate standard of living or to life [83].

The right to life is the most fundamental of all the rights: “All other rights add quality to the life in question and depend on the pre-existence of life itself for their operation” [84], [85]. It is also “one of the more controversial rights, due to the inherent problems in defining its scope at the peripheries” [84]. There has been a noticeable shift in the scope of the right to life as understood in international human rights law. The initial understanding was that it merely imposes an obligation on the state not to arbitrarily and unlawfully take the life of individuals [86]. The earlier narrow interpretation of the right to life is based on the now obsolete distinction between civil and political rights on the one hand and economic, social and cultural rights on the other hand [87]. Earlier proponents of the recognition of water as a human right attempted to present it as a right implied into the generally recognized right to life [76]. This is also consistent with the recently accepted broader interpretation of the right to life

[88], [89]. However narrow view of the right to life one may have, it could still be argued that it includes protection against arbitrary and intentional denial of access to sufficient water [76].

The right to health is provided in Article 12 of the ICESCRs which provides, in parts, “the States Parties to the present Covenant recognize the right of everyone to the enjoyment of the highest attainable standard of physical and mental health” [82]. Considering the importance of having access to adequate, safe and affordable water to the physical and mental health of individuals, one could also argue on this basis that the right to health should include the right to water.

Article 25 of the UDHR provides that “everyone has the right to a standard of living adequate for the health and well-being of himself and of his family, including food, clothing, housing and medical care and necessary social services”. Likewise, Article 11 of the International Covenant on Economic, Social and Cultural Rights is concerned with the right of individuals to an adequate standard of living. It partly reads: “The States Parties to the present Covenant recognize the right of everyone to an adequate standard of living for himself and his family, including adequate food, clothing and housing, and to the continuous improvement of living conditions”. The use of the term ‘including’ in Article 11 is taken to imply that the list is merely illustrate; it is not meant to exhaustively contain the elements essential for an adequate standard of living. On this basis, therefore, it is argued that water can be read into this provision as it is an essential element of an adequate standard of living [76]. The Committee on Economics, Social and Cultural Rights (CESCRs) has relied on the right to health and adequate standard of living enshrined in Articles 11 and 12 of IESCRs in formulating its General Comment on the right to water.

C. The Right to Water in Ethiopia and Kenya

The term ‘water’ is specifically used in Ethiopian Constitution in two places. The first is with respect to the powers of the federal government: that it has the power to administer water bodies connecting or crossing two or more states [29]. The second reference is to be found in the part of the Constitution which lists national objectives and policies. These are expected to guide the activities of governments at the federal, state and local levels. The extent to which this part of the Constitution is immediately applicable is not clear. One of the social objectives is: “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”.

Despite the fact that the Constitution does not expressly recognize the right to water, it should be noted that it contains a number of provisions which imply the right to water. These rights are not merely civil and political rights but they include a number of economic, social and cultural rights.

Article 13(1) prescribes “all federal and state legislative, executive and judicial organs at all levels shall have the responsibility and duty to respect and enforce” these rights and freedoms. This indicates that such rights and freedoms as recognized in the Constitution impose not only negative but also positive obligations on government organs. This is consistent with the current thinking in international human rights. In addition, Article 13(2) stipulates that interpretation of the fundamental rights and freedoms enshrined in the Constitution has to conform to international human rights law and treaties such as the UDHRs and the ICCPRs. International human rights law is relevant not only as an interpretive tool but also as part of Ethiopian law. Article 9(4) recognizes all international agreements ratified by Ethiopia as an integral part of the law of the land.

Article 14 states that “every person has the inviolable and inalienable right to life, the security of person and liberty”. This is further elaborated in Article 15: “every person has the right to life. No person may be deprived of his life except as a punishment for a serious criminal offence determined by law”. With respect to this right governmental organs at all levels have the obligation to not only respect but also ‘enforce’. It is not clear if the term ‘enforce’ includes positive obligations and if so what kind of positive obligations are included. This needs proper constitutional interpretation, as one of the most fundamental rights in the Constitution, right to life is also to be interpreted in accordance with international human rights law. In this regard, therefore, one should take note of General Comments 6 and 14 on the right to life by the Human Rights Committee. Accordingly, therefore, governments at all levels have positive obligations with respect to the right to life. In addition, the following are some other provisions which could be construed to include the right to water. Article 41(3) states that “every Ethiopian national has the right to equal access to publicly funded social services”. Article 44(4) provides that “the state has the obligation to allocate an ever increasing resources to provide to the public health, education and other social services”. Article 43 is concerned with the right to development and it reads in part: “The peoples of Ethiopia as a whole, and each nation, nationality and people in Ethiopia in particular have the right to improved living standards and to sustainable development”. Article 44 also

provides that “all persons have the right to a clean and healthy environment”.

The present constitution of the Republic of Kenya does not contain any reference to the right to water. However, Article 43 of the Draft Constitution which is the subject of referendum makes a specific provision regarding the right to water: “every person has the right to clean and safe water in adequate quantities”. Even if there is no particular national legislation which specifically recognizes the right to water, one can argue that the state of Kenya as one of the States Parties to the International Bill of Rights is bound by the obligations emanating from the right to water.

D. The Content of the Right to Water: General Comment 15

However recognized the right to water is, a problem still exists as to the content of the right to water and the corresponding state obligations. There has been a great deal of uncertainty until the publication of General Comment 15 which sets out the normative content of the right to water [90]. Determining the scope of this right is essential because as Gleick remarked ‘a right to water cannot imply a right to an unlimited amount of water’ [83].

Paragraph 6 states that “priority in the allocation of water must be given to the right to water for personal and domestic uses. Priority should also be given to the water resources required to prevent starvation and disease, as well as water required to meet the core obligations of each of the Covenant rights” [90].

The right to water is said to contain two elements: freedoms and entitlements. “The freedoms include the right to maintain access to existing water supplies necessary for the right to water, and the right to be free from interference, such as the right to be free from arbitrary disconnections or contaminations of water supplies” [90]. The “entitlements include the right to a system of water supply and management that provides equality of opportunity for people to enjoy the right to water” [90]. Elements of the right to water must be adequate for human dignity, life and health [90]. The adequacy of water has several dimensions: availability, quality, physical accessibility, economic accessibility, non-discrimination and information accessibility [90].

E. Implications of the Right to Water

One of the questions that can be raised in relation to the human right to water is as to whether there is any value added by the human rights perspective to the national and international efforts to expand access to safe and affordable water: how does the human right status of water help in expanding access to safe and affordable water?

Anand asserts that a human right based approach to water legitimates the Millennium Development Goals and highlights taking action as an obligation and not as a matter of gratuity [91]. Stated in other words, it transforms the development goals from hortatory and aspirational to legally binding targets [79]. There are some who are cynical about the value added by the human right rhetoric to the water sector [91], [93]. In order to understand the significance of the right to water in ensuring access to safe and affordable water, one has to go beyond the content of the right and see the duties which flow from the right [92]. It is now generally accepted that human rights give rise to five kinds of duties: respect right of others; create institutional machinery essential to realization of rights; protect rights/prevent violations; provide goods and services to satisfy rights; and promote rights [92]. It should be noted that the qualification of ‘progressive realization’ affects only certain type of state duties [94]. The General Comment 15 categorizes specific state obligations emanating from the right to water into three categories: obligations to respect, to protect and to fulfill [90]. But most importantly General Comment 15 recognizes that the right to water requires states to regulate water providers: “where water services (such as piped water networks, water tankers, access to rivers and wells) are operated or controlled by third parties, States parties must prevent them from compromising equal, affordable, and physical access to sufficient, safe and acceptable water. To prevent such abuses, an effective regulatory system must be established...which includes independent monitoring, genuine public participation and imposition of penalties for non-compliance” [90].

VII. REGULATORY IMPLICATIONS OF THE RIGHT TO WATER: CONCLUDING REMARKS

The right to water which can be based on a number of rights expressly recognized in national constitutions and international human rights instruments impose a number of obligations on governments. Traditionally such obligations were not taken seriously on the ground that they are subject to resource availability. But in recent years a consensus has emerged that only certain obligations of governments are subject to resource availability. The duty to protect, for example, as opposed to the duty to provide, is not a resource intensive obligation and is often taken as immediate obligation. One of these obligations is the duty to regulate. The General Comment 15 specifically deals with this duty. It is not also restricted to conventional water utilities. Therefore, it can be argued that governments in Ethiopia and Kenya have the duty to regulate the operation of SIPs with the view to ensure that the

water they are providing is safe. The need for regulation of the safety of water has already been discussed. The right to water transforms this need into a duty to regulate.

As opposed to some of the views in the literature on small-scale water supply, it is found that there is no public interest case for price regulation considering the unique model that such market is based on. Studies of water prices in the case studies show that there are serious problems of affordability. But these cannot be solved or minimized by regulating price. On the contrary, it would only raise the price by driving out some providers and by making some households unattractive to serve. Price regulation when there is no need might therefore constitute arbitrary interference and hence violation of the right to water [90]. However, governments must and should take some general regulatory and non-regulatory measures to make water by SIPs affordable. These include avoiding costly and inappropriate regulatory measures such as prohibition of the activities of SIPs. Therefore, the right to water does not merely transform an identified need into a state duty to regulate. It has also implications on the manner and content of the regulatory regime. Some forms of SIPs may rightly be exempted. And with respect to the others, non-conventional, cooperative and participatory approaches to regulation must be explored.

REFERENCES

- [1] T. M. Solo, "Competition in water and sanitation: The role of small-scale entrepreneurs", *Viewpoint*, Note No. 165, December 1998.
- [2] T. M. Solo, "Small-scale entrepreneurs in the urban water and sanitation market", *Environment and Urbanization*, vol. 11, no. 1, pp. 117—131, April 1999.
- [3] B. Collignon and M. Vézina, *Independent Water and Sanitation Providers in African Cities: Full Report of a Ten-Country Study*. Washington, DC: World Bank, 2001.
- [4] World Bank, "The experience of small-scale water providers in serving the poor in Metro Manila", *Field Note*, no.4, January 2004.
- [5] M. Kariuki and J. Schwartz, "Small-scale private service providers of water supply and electricity: A review of incidence, structure, pricing and operating characteristics", *World Bank Policy Research Working Paper*, no. 3727, September 2005.
- [6] World Bank, *Better Water and Sanitation for the Urban Poor: Good Practice from Sub-Saharan Africa*. Washington, DC: World Bank, 2003.
- [7] M. Basani, J. Isham and B. Reilly, "The determinants of water connection and water consumption: Empirical evidence from a Cambodian household survey", *World Development*, vol. 36, no. 5, pp. 953—968.
- [8] A. C. McIntosh, *Asian Water Supplies: Reaching the Urban Poor*. Manila: Asian Development Bank, 2003.
- [9] D. Ehrhardt, "Impact of market structure on service options for the poor", presented at the conference of Infrastructure for Development: Private Solutions and the Poor, May 31-June 2, 2000, London, UK.
- [10] G. McGranahan, C. Njiru, M. Albu, M. Smith, and D. Mitlin, *How Small Water Enterprises Can Contribute to the Millennium Development Goals: Evidence from Dar es Salaam, Nairobi, Khartoum and Accra*. WEDC: Loughborough University, 2006.
- [11] D. Whittington, D. T. Lauria and X. Wu, "A study of water vending and willingness to pay for water in Onitsha, Nigeria", *World Development*, vol. 19, no.213, pp. 179-198, February-March 1991.
- [12] D. Whittington, J. Briscoe, X. Mu and W. Barron, "Estimating the willingness to pay for water services in developing countries: A case study of the use of contingent valuation surveys in Southern Haiti", *Economic Development and Cultural Change*, vol. 98, no. 2, pp. 293—311, January 1990.
- [13] World Bank, *Water Resources Sector Strategy: Strategic Directions for World Bank Engagement*. Washington, DC: World Bank, 2004.
- [14] A. Nickson, "The Còrdon water concession in Argentina", *GHK Working Paper*, no. 442 05, January 2006.
- [15] WHO, *Water Supply and Sanitation Sector Assessment 2000, Part 2*. Brazzaville: WHO, 2000.
- [16] S. Marvin and L. Laurie, "An emerging logic of urban water management, Cochabamba, Bolivia", *Urban Studies*, vol. 36, no. 2, pp. 341—357, February 1999.
- [17] WHO, *Guidelines for Drinking Water Quality*. Geneva: WHO, 2004.
- [18] A. Allen, J. D. Dávila and P. Hofmann, "The peri-urban water poor: Citizens or consumers?" *Environment and Urbanization*, vol. 18, no.2, pp. 333—351, October 2006.
- [19] A. Nickson and C. Vargas, "The limitations of water regulation: The failure of the Cochabamba concession in Bolivia", *Bulletin of Latin American Research*, vol.21, no.1, pp. 99—120, January 2002.

- [20] M. Kariuki and G. Acolor, "Delivery of water supply to low-income urban communities through the Teshie Tanker Owners Association: A case study of public-private initiatives in Ghana", presented at the conference of Infrastructure for Development: Private Solutions and the Poor, May 31-June 2, 2000, London, UK.
- [21] N. P. Matsinhe, D. Juizo, B. Macheve and C. Santos, "Regulation of formal and informal water service providers in peri-urban areas of Maputo, Mozambique", *Physics and Chemistry of the Earth*, vol. 33, pp. 841—849, July 2008.
- [22] R. Crane, "Water markets, market reform and the urban poor: Results from Jakarta, Indonesia", *World Development*, vol. 22, no. 1, pp. 71—83, January 1994.
- [23] Addis Ababa City Government, "Addis Ababa Water and Sewerage Authority Re-Establishment Proclamation No. 10/1995", *Addis Negari Gazeta*, 3rd year, no.3, May 1995.
- [24] Addis Ababa City Government, "The Addis Ababa Water Supply and Sewerage Disposal Services Regulations No. 31/2002", *Addis Negari Gazeta*, 5th year, no.1, July 2002.
- [25] Ministry of Water and Irrigation (Kenya), *Report on Operationalisation of the Water Act 2002 in Water Resources Management*. Nairobi: Government of Kenya, 2005.
- [26] Government of Kenya, *Water Act 2002*. Nairobi: Government of Kenya, 2002.
- [27] Lake Victoria South Water Services Board, "Identification of implementation and management arrangements for improved water and sanitation services to informal settlements in Kisumu", unpublished.
- [28] Lake Victoria South Water Services Board, "Service provision agreement between LVSWSB and KIWASCO", unpublished.
- [29] Federal Democratic Republic of Ethiopia, "Proclamation of the Constitution of the Federal Democratic Republic of Ethiopia", *Federal Negarit Gazeta*, 1st year, no. 1, August 1995.
- [30] Federal Democratic Republic of Ethiopia, "Ethiopian Water Resources Management Proclamation No. 197/2000", *Federal Negarit Gazeta*, 6th year, no. 25, March 2000.
- [31] Quality and Standards of Authority (Ethiopia), "Water quality standards", unpublished.
- [32] Federal Democratic Republic of Ethiopia, "Addis Ababa City Government Revised Charter Proclamation", *Federal Negarit Gazeta*, 9th year, no. 86, July 2003.
- [33] W. Sammy, "Water privatization in Kenya", *Global Issue Papers*, no.8, March 2004.
- [34] A. Ngigi and D. Macharia, "Kenya", *Water Sector Policy Overview Paper*, May 2006.
- [35] O. A. K'Akumu, "Privatization model for water enterprise in Kenya", *Water Policy*, vol. 8, pp. 539—557, 2006.
- [36] A. Mumma, "Kenya's new water law: An analysis of the implications of Kenya's Water Act, 2002, for the rural poor", in *Community-based Water Law and Water Resource Management Reform in Developing Countries*, B. van Koppen, M. Giordano and J. Butterworth, Eds. CAB International, 2007, pp. 158—172.
- [37] O. A. K'Akumu, "Privatization of the urban water supply in Kenya: Policy options for the poor", *Environment and Development*, vol. 16, no. 2, pp. 213—222, October 2004.
- [38] K. K. Orie, "Proposed amendment to Kenya's water legislation: Some missing sustainable water resources management principles", *Water Resources Development*, vol. 12, no. 1, pp. 79—88, 1996.
- [39] Government of Kenya, "The Water Resources Management Rules, 2007", *Kenya Gazette Supplement*, no. 92, September 2007.
- [40] T. Prosser, *Law and the Regulators*. Oxford: Oxford University Press, 1997.
- [41] J. Black, "Critical reflections on regulation", *Australian Journal of Legal Philosophy*, vol. 27, pp. 1-35, 2002.
- [42] R. Baldwin and M. Cave, *Understanding Regulation: Theory, Strategy and Practice*. Oxford: Oxford University Press, 1999.
- [43] A. I. Ogus, *Regulation: Legal Form and Economics*. Oxford: Clarendon Press, 1994.
- [44] E. Groom, J. Halpern, and D. Ehrhardt, "Explanatory notes on key topics in the regulation of water and sanitation services", *Water Supply and Sanitation Sector Board Discussion Paper Series*, no. 6, June 2006.
- [45] R. Schmalensee, *The Control of Natural Monopolies*. Lexington Books, 1979.
- [46] D. Helm, "Regulatory reform, capture, and the regulatory burden", *Oxford Review of Economic Policy*, vol. 22, no. 2, pp. 169-185, 2006.
- [47] A. I. Ogus, "Regulatory institutions and structures", *Annals of Public and Cooperative Economics*, vol. 73, no.4, pp. 627-648, February 2003.
- [48] E. D. Bó, "Regulatory capture: A review", *Oxford Review of Economic Policy*, vol. 22, no.2, pp. 203-225, 2006.
- [49] T. Balance and A. Taylor, *Competition and Economic Regulation in Water: The Future of the European Water Industry*. London: IWA Publishing, 2005.

- [50] D. Parker, "Economic regulation: A review of issues", *Annals of Public and Cooperative Economics*, vol. 73, no. 4, pp. 493-519, February 2003.
- [51] J. A. Beecher, *Consolidated Water Rates Issues and Practices in Single Tariff Pricing*. Diane Publishing, 1999.
- [52] F. Parker, "Applying the costs principle-Ofwat's first wholesale access price determination", *Journal of Water Law*, vol. 18, no. 6, pp. 187-190, 2007.
- [53] F. Parker, "The legalities of competition in water markets-comparing Scotland with England and Wales", *Journal of Water Law*, vol. 18, no.5, pp. 167-170, 2007.
- [54] C. Robinson, "Introducing competition into water", in *Regulating Utilities: Broadening the Debate*, M. E. Beesley, Ed., IEA, 1997.
- [55] T. J. Brennan, "Regulation and competition as complements", in *Obtaining the Best From Regulation and Competition*, M. A. Crew and M. Spiegel, Eds., Springer, 2005.
- [56] OECD, *Social Issues in the Provision and Pricing of Water Services*. OECD Publishing, 2003.
- [57] National Consumer Council, *In the Absence of Competition: A Consumer View of Public Utilities Regulation*. National Consumer Council: Books, 1989.
- [58] H. Averch and L. L. Johnson, "Behavior of the firm under regulatory constraint", *American Economic Review*, vol. 52, no. 5, pp. 1052-1069, December 1962.
- [59] S. C. Littlechild, "The regulation of privatized monopolies in the United Kingdom", in *Regulators and the Market: An Assessment of the Growth of Regulation in the UK*, C. Veljanovski, Ed., IEA, 1991.
- [60] M. U. Klein, "Economic regulation of water companies", *World Bank Policy Research Working Paper*, no. 1649, 1996.
- [61] L. Rovizzi and D. Thompson, "The regulation of product quality in the public utilities", in *The Regulatory Challenge*, M. Bishop, J. Kay and C. Mayer, Eds., Oxford University Press, 1995.
- [62] P. Asch, *Consumer Safety Regulation: Putting a Price on Life and Limb*. Oxford University Press, 1988.
- [63] G. J. Stigler, "The economics of information", *Journal of Political Economy*, vol. 69, no. 3, pp. 213-225, June 1961.
- [64] K. J. Arrow, "Information and the organization of industry", in *Markets, Information and Uncertainty: Essays in Economic Theory in Honor of Kenneth J. Arrow*, G. Chichilnisky, Ed., Cambridge University Press, 1999.
- [65] G. A. Akerlof, "The market for 'lemons': Quality uncertainty and the market mechanism", *Quarterly Journal of Economics*, vol. 84, no. 3, pp. 488-500, August 1970.
- [66] M. R. Darby and E. Karni, "Free competition and the optimal amount of fraud", *Journal of Law and Economics*, vol. 16, no. 1, pp. 67-88, April 1973.
- [67] P. Nelson, "Information and consumer behavior", *Journal of Political Economy*, vol. 78, no. 2, pp. 311-319, March 1970.
- [68] P. Nelson, "Advertising as information", *Journal of Political Economy*, vol. 82, no. 4, pp. 729-754, August 1974.
- [69] S. S. Srinivasan and B. D. Till, "Evaluation of search, experience and credence attributes: Role of brand name and product trial", *Journal of Product and Brand Management*, vol.11, no.7, pp. 417-431, 2002.
- [70] D. Asch and B. Wolfe, *New Economy, New Competition: The Rise of the Consumer?* Palgrave Macmillan, 2001.
- [71] N. Ireland, "Information asymmetries and product quality regulation", in *The Regulatory Challenge*, M. Bishop, J. Kay and C. Mayer, Eds., Oxford University Press, 1995.
- [72] C. Shapiro, "Premiums for high quality products as returns to reputations", *Quarterly Journal of Economics*, vol. 98, no. 4, pp. 659-680, November 1983.
- [73] C. Shapiro, "Consumer information, product quality and seller reputation", *Bell Journal of Economics and Management Science*, vol. 13, no. 1, pp. 20-35, 1982.
- [74] M. Cooper and P. Howsam, "Rights to water? A Northern Ireland case explored", *Journal of Water Law*, vol. 18, no.4, pp. 122-125, 2007.
- [75] UN, *Convention on the Elimination of All Forms of Discrimination Against Women*, 1979.
- [76] J. Scanlon, A. Cassar and N. Nemes, "Water as a human right", *IUCN Environmental Policy and Law Paper*, no. 51, 2005.
- [77] N. Kaufman Hevener, "An analysis of gender based treaty law: Contemporary developments in historical perspective", *Human Rights Quarterly*, vol. 8, no. 1, pp. 70-88, February 1986.
- [78] UN, *Convention on the Rights of the Child*, 1989.
- [79] A. Cahill, "The human right to water-A right of unique status: The legal status and normative content of the right to water", *The International Journal of Human Rights*, vol. 9, no. 2, pp. 389-410, September 2005.
- [80] UN, *Universal Declaration of Human Rights*, 1949.

- [81] UN, *International Covenant on Civil and Political Rights*, 1966.
- [82] UN, *International Covenant on Economic, Social and Cultural Rights*, 1966.
- [83] P. H. Gleick, "The human right to water", *Water Policy*, vol. 1, no. 5, pp. 487-503, 1999.
- [84] R. K. M. Smith, *Textbook on International Human Rights*. Oxford University Press, 2010.
- [85] F. Menghistu, "The satisfaction of survival requirements", in *The Right to Life in International Law*, B. G. Ramcharan, Ed., Martinus Nijhoff Publishers, 1985.
- [86] Y. Dinstein, "The right to life, physical integrity and liberty", in *The International Bill of Rights-The Covenant on Civil and political Rights*, L. Henkin, Ed., New York: Columbia University Press, 1981.
- [87] M. Pieterse, "A different shade of red: Socio-economic dimensions of the right to life in South Africa", *South African Journal of Human Rights*, vol. 15, no. 3, pp. 372-385 (1999).
- [88] H. J. Steiner and P. Alston, *International Human Rights in Context: Law, Politics, Morals (2nd Ed.)*. Oxford University Press, 2000.
- [89] UN, *General Comment 6: Right to Life*, 1982.
- [90] UN, *General Comment 15: Right to Water*, 2002.
- [91] P. B. Anand, "Right to water and access to water: An assessment", *Journal of International Development*, vol. 19, no. 4, pp. 511-526, April 2007.
- [92] H. J. Steiner, P. Alston and R. Goodman, *International Human Rights in Context: Law, Politics, Morals (3rd Ed.)*. Oxford University Press, 2008.
- [93] O. Varis, "Right to water: The Millennium Development Goals and water in the MENA Region", *Water Resources Development*, vol. 23, no. 2, pp. 243-266, June 2007.
- [94] M. Green, "What we talk about when we talk about indicators: Current approaches to human rights measurement", *Human Rights Quarterly*, vol. 23, pp. 1062-1097, 2001.

About Authors:

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M. M. Ayalew is a PhD candidate in the School of Law, University of Surrey, Guildford, Surrey, UK, GU2 7XH (phone: +447405257817; e-mail: m.ayalew@surrey.ac.uk).

R. Malcolm is Professor of Law, Head of the School of Law, and Director of the Environmental Regulatory Research Group, University of Surrey (e-mail: r.malcolm@surrey.ac.uk).

L. Okotto just completed her PhD in the Center for Environmental Strategy and the Postgraduate Medical School, University of Surrey. (email:l.okotto@surrey.ac.uk)

S. Pedley is Senior Research Fellow in the Postgraduate Medical School, University of Surrey (e-mail: s.pedley@surrey.ac.uk).

J. Chenoweth is a Senior Lecturer in the Centre for Environmental Strategy, University of Surrey (e-mail: j.chenoweth@surrey.ac.uk).

Yacob Mulugetta is a Lecturer in the Centre for Environmental Strategy, University of Surrey (e-mail: y.mulugetta@surrey.ac.uk)