



## **Public Private Partnership, water and poverty in Rwanda:**

**A case study on effects of market based approaches  
on safe drinking water access in Musanze district**

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## List of Acronyms

CLGF	Commonwealth Local Government forum
DWT	District Wash Teams
EDPRS	Economic Development and Poverty Reduction
EICV	Integrated Household Living Conditions Survey
EWSA	Electricity Water and Sanitation
GDP	Growth Domestic Product
IBT	Increasing Block tariff
IDSC	International District steering Committee
IMF	International Monetary Fund
ISS	Institute of Social Studies
MDG	Millennium Development Goals
MINALOC	Ministry of Local Government
MINEDUC	Ministry of Education
MINESANTE	Ministry of Health
MININFRA	Ministry of Infrastructure
MPI	Multidimensional Poverty Index
NGO	Non Governmental Organisations
NPMU	National Project Management Unit
NSA	Non State Actors
NSA	Non State Actors
OECD	Organisation for Economic cooperation and Development
PFP	Private for Profit
PNP	Private non Profit
PPP	Public Private Partnership
RURA	Rural Utilities Regulatory Agency
SNV	Netherlands development Organisation
UNDP	United Nations Development Programme
VDT	Volume Differentiated Tariffs
WASH	Water Sanitation and Hygiene
WASH	Water Sanitation and Hygiene

## **Abstract**

Water service delivery has increasingly become controversial with the attempts to push services to market-based models of delivery. This is happening in the developing countries with the assistance of the international development agencies like World Bank and other big multi-lateral organizations. The resistance against such mechanisms is not sometimes understood fully.

This study looks at the case of Rwanda and Musanze district in particular. The findings show that there are still difficulties in broader policy practice and reporting in analysing deeper difficulties communities face in accessing water. The measurement of only distance from the nearest source conceals several issues communities go through. Community members with low income levels end up spending far larger proportions of their incomes on water than the well-off ones and it becomes unfair for community wellbeing. There is need to analyse poverty in various dimensions and factor it into the design of water service delivery mechanisms. But more so, water may best be provided without market-oriented principles of cost-recovery and ‘user-pays’ as is being promoted internationally.

## **Relevance to Development Studies**

The paper makes a contribution on issues of public-private partnerships and how they in reality turn to work in the developing countries. The principles that are theoretically posted including Principal-Agent theory and New Public Management among others have a lot of challenges in realization of their intended outcomes. This could potentially add to our understanding of the different variables that need to be theoretically reconsidered.

## **Keywords**

Public-Private Partnerships, Water, Poverty, Musanze, Rwanda

# Chapter 1 Introduction

The privatization of water services has been decried in many parts of the world for often depriving the poor of access to sufficient safe drinking water. Communities and civil society agencies have insisted that water be distributed outside the profit-seeking market motives basing on the understanding of it as a merit good and its natural monopoly tendency (Jooste 2008). Governments have received more demands to take charge of water service delivery (Chan 2009). In other cases interest has increased in large-scale non-profit operators. Public-private partnerships (PPP) in water delivery have been perceived mostly as transitional stages towards full privatization which attracts civic resistance. The predominant problem however in most PPP arrangements is that private water companies mostly overcharge consumers, sometimes multiplying previous public rates manifold and are not uniform across localities or neighbourhoods (Allinnettes 2004; Obayagbona 2008). They simultaneously weaken public sector regulation, which is a critical contributor to unchecked overpricing.

From their entry into mainstream promotion in international development and aid practice, non-state actors (NSA) have been argued to compensate for the limited financial and technical capacity of the government to undertake large-scale delivery (Jooste 2008: 8; Obayagbona 2008). In some cases the governments themselves exhibit weaknesses and choose to hand management of water services to the private sector (Loong and Danqing 2006). In whichever way, the effect has commonly been inequitable water supply disadvantaging the poor sections of the population, or actually reducing water consumption capacity in general (ibid.).

The big international donors in particular World Bank and International Monetary Fund (IMF) have been the leading influencing agencies for policies towards privatization of water service delivery on the claim of inefficient government management (Allinnettes 2004). Other arguments added are cutting public expenditure, promoting cost-sharing, reducing wastage and improving sustainability. These orientations have been followed or similarly argued by other international non-governmental organization (NGOs). SNV (Netherlands Development Organisation) (2013) in its report on Rwanda extends the assertion to all public provision of infrastructure in Rwanda that it has tended to have short operational life-spans because of insufficient maintenance.

Rural water service delivery in Rwanda including tariffs, contract management and monitoring is by national policy a responsibility of the Rural Utilities Regulatory Agency (RURA). But with the increasing influence of the above arguments and policy advice, a thinking of the private sector efficiency and cost-effectiveness, Rwanda's policy framework has placed rural water supply increasingly in private operators' hands. For the while, urban water system and the sanitation systems management remained under the public Energy, Water and Sanitation Authority (EWSA). But these are also increasingly getting run on a PPP or quasi-private model. The home standpipes extended by the agency to private residences are billed directly by it. The public access kiosks are contracted out to private operators just in the same manner as the rural water sources. Water service delivery in Rwanda in all, is increasingly on market basis, both rural and urban.

The government on its side claims successful delivery of water services has been out of public-private partnership (PPP) with its development partners in the water sector (Ministry of Infrastructure 2010: 9, 12, 18, 52). The government reports a coverage level of safe drinking water in the country at 74% by 2011 (Republic of Rwanda 2013a: 7, 70). Integrated Household Living Conditions Survey (EICV3 2010/11) shows that 74% of the households in the Musanze district use improved water sources, including protected springs, public standpipes, water piped into dwelling/yard, boreholes, protected wells and rainwater collection. The survey further reveals that 60% of the households use public standpipe or water piped into dwelling/yard. These Musanze figures in the survey are the lowest among the districts in the Northern Province. The highest rate is observed in Gicumbi (89.4%), followed by Burera (76.8%), Gakenke and Rulindo (both at 74.6%) (Republic of Rwanda 2013c: 7-10). Within these reports are contradictions that Musanze residents on average walk the shortest distance to the nearest safe water point (9.7 minutes average) (ibid.: 9). But paradoxically, Masanze among all the Northern Province districts has the lowest percentage of its population using water from safe water sources. Residents in other districts walk longer distances to the water points but higher proportions of them use water from safe water points.

Other statistics report that nearly 70% of Rwandans still get water from open sources, mainly streams and rivers (Charity water 2012: 1). It also acknowledged that Rwanda, women and children spend at least 29 minutes a day in collecting water for their household use although they consume only between six and eight litres per capita (SNV 2013: 5). SNV as one of the active organizations in the water sector in Rwanda has responded to the situation by implementing the “Acceleration of Water Supply, Sanitation and Hygiene (WASH) programme. Under this programme, previously community managed and public water sources now under WASH are entrusted to contracted private operators. The operators to charge fees for water access from community members and manage the operation and maintenance on behalf of the local governments and communities. The approach presumes that the private operators through cost-recovery (market-based principles) will ensure better maintenance than the previous community management approaches (SNV 2013: 9-10). Musanze is the most covered district in this programme with 88% (34,305) population not previously accessing safe water (before 2009) now covered. The remaining 12% (4,600) are thought will be covered by the end of December 2013. (Republic of Rwanda 2013c: 7-10).

### **The Research Problem**

In view of experiences in market-oriented models to water service delivery in many parts of the world, there have been genuine demerits expressed. Rwanda is in a contradiction of statistics between coverage and actual utilization of safe drinking water sources. This is especially the case with Musanze district. This paper’s effort is to highlight how cost-recovery, as a market-based model for water delivery affects public access to water, in a context of high local poverty prevalence in Musanze district.

Many communities, including rural ones in Rwanda, have long regarded water as a God-given free-access good. Rwanda is a low income, largely peasant country. The World Bank development indicators show that in 2011, its GDP per capita was only US \$ 582.5 per annum. The Poverty headcount ratio at \$2 a day (PPP) was at 82.37% of the population. In ac-



cordance to the locally defined poverty definition, the Poverty headcount ratio stood at 48.7% of the rural population and 22.1% of the urban population, and the proportion of people below the poverty line for the country as whole was 44.9% (World Bank data 2013). SNV itself reports that affordability (or poverty) is a major barrier to access to services for people in Rwanda, including safe water (SNV 2013: 9). Yet, low income levels and wide disparities have failed to persuade SNV to differentiate rates of water in accordance with different forms of set up and locations (gravity and power pumped) (SNV 2013: 9-10). As a result, all the charges of water have been standardized everywhere. This paper addresses the question of how equitable the public accessibility to water has been in Musanze given the widely varying income levels and reported underutilization of safe water sources.

### **Research question**

How does the market-based model of water delivery limit access to water for the income-poor in Musanze?

### **Sub-questions**

- a) What are the water utilization patterns in Musanze?
- b) What are the perceptions of community members under our case study on water provision and access?
- c) What control does the community under our case study have over market-based operation processes and does it still ensure empowerment and strong community ownership?
- d) What type of tariff structure Rwanda implemented in this case study?
- e) Could the idea of the right to water as a merit good influence the governance structures so as to overcome excess profit motives of private PPP partners?

### **Research strategy**

This study employs both quantitative and qualitative research techniques. Poverty is measured in monetary terms, which provides a base for understanding the existing income inequalities among the respondent population. The disparities of water bills to incomes of the samples of the study are tabulated and presented in graphs, charts and tables.

This study is based on a mini-survey undertaken in 3 communities served with the WASH water facilities in the Musanze district in Rwanda, the local government authorities in them, the partner NGOs and the private water-point operators.



The Musanze district was selected, from the four districts where the same project is being implemented, as it is the most advanced in implementing the project, expected to complete in December 2013 with all the population having been reached (SNV 2013: 7-8). Interviewees were randomly selected from the community members for further information.

Additional data collection was done through in-depth interviews with service providers (government, NGO and private operators) and community members. Further information was obtained from document review (secondary data).

## Relevance and Justification

This paper is an examination of how cost-recovery preoccupation in service delivery affects or sets barriers to access to water. It contributes in highlighting what Robert Chambers termed a “web of poverty’s disadvantages” (Chambers 2006) that is often over focused on or actually missed by poverty reduction efforts in developing countries.

The human capital theories propose that a healthy population is an asset that generates growth in the economy. If the water is left free, it is possible that all sections of the population can access to it and be able to have healthier lives in an equitable fashion. This in turn enhances the general productivity of the population. An understanding by government of this circle might be a prompt to devise better strategies to ensure that increased productivity contributes to the rise of national revenue enabling the government to maintain the water sources and to reduce the cost-burden on the people. It may be beneficial to keep the water free as long as the government properly strategizes to raise population productivity and harvest the after-returns, recycle them and keep the flow.

### **Limitations**

The study was a mini-survey of the communities in Musanze. Due to time and resource limits though, the sample is not so big as to make a generalizable picture of the whole situation in the whole district. This was a challenge encountered in the study. But other measures like the indicators provided by the recent national surveys by the National Institute of Statistics, those from World Bank on incomes and poverty and those from United Nations Development Programme (UNDP) on poverty incomes have been used comparatively to address the gaps in the small size of the study sample.

### **Arrangement of the paper**

The rest of this paper consists of four chapters. Chapter 2 presents a discussion on various theoretical and analytical frameworks that are related to public goods in general and water delivery in particular in the context of developing countries. Chapter 3 introduces Rwanda, particularly its poverty situation in which water delivery remains an essential social service. Chapter 4 briefly explains the WASH project, a PPP project for water delivery service undertaken since 2009, and presents major analytical findings of my field study conducted in July 2013.

## Chapter 2 Theoretical and analytical framework

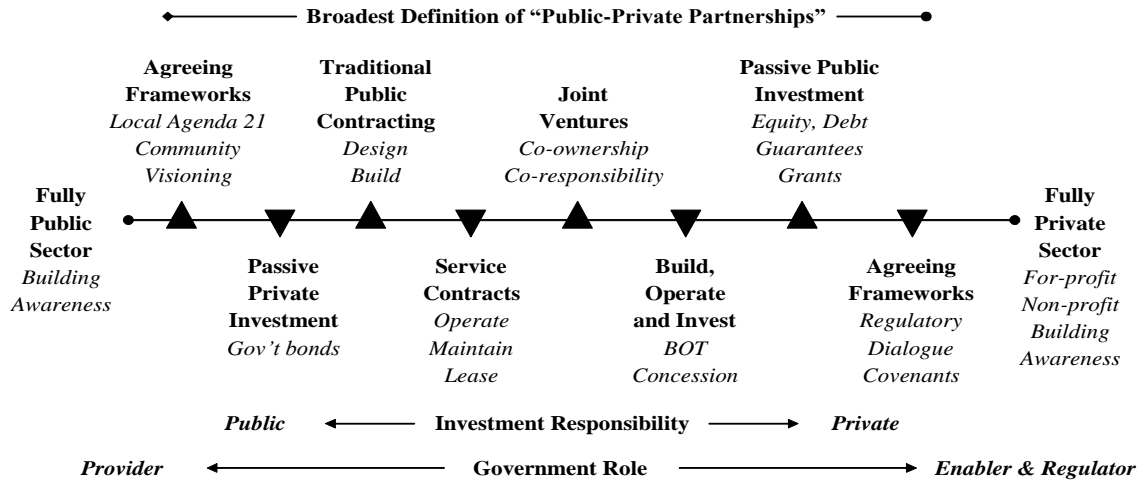
### Public Private Partnership (PPP)

PPP strongly came to dominate international development practice with what has been commonly referred to as 'new managerialism' or 'New Public Management'. This became a more preferred alternative to the prevailing 'strong state' or state-led development practices (Pessoa 2008). With the signs of failure of the state, the market actors/private sector began to be promoted as more effective and cost-efficient and flexible (Awortwi 2004). Others saw it as the redesigning of development by neoliberal policy orientations, but in areas that seemed uneasy to completely abandon to the private sector through privatization (*ibid.*). PPPs have in most cases gone hand in hand with pressures on governments to privatize their service delivery (Batley 1996). In the recent times, PPPs have been argued as deliberate efforts by governments and actors to solicit extra missing resources for their service delivery and overcome challenging social problems that they cannot necessarily handle alone (Brinkerhoff and Brinkerhoff 2011:12).

PPPs rose with more attribution to the government's working with other non-state actors to deliver infrastructural needs. The processes include joint planning, construction and management, sharing risks, costs, benefits, resources and responsibilities (Koppenjan 2005 in Brinkerhoff and Brinkerhoff 2011). The same authors cite Grimsey and Lewis (2007) who similarly refers to PPPs in terms of private actors involved in infrastructure delivery through contract terms (*ibid.*: 3). Brinkerhoff and Brinkerhoff (2011: 4) in a different perspective treat PPPs as collaborations across the sectors (public, private, etc.) whose goals and decisions are jointly and consensually reached, the actors/collaborators work at equal power levels without hierarchies, they depend on each other with mutual trust that utilizes both formal and informal relations, is directed at increasing each other's strength and all are accountable for the outcomes of their joint undertakings.

Batley (1996: 727) gives a spectrum of the move of services from public to private. These include the fully public services, contracted out services, lease/franchised services, regulated public and private competition for example in education service delivery, licensed/regulated private competition like transport services, joint venture with the private actors for example in land acquisition and development and joint venture with beneficiaries as in the example of slum improvement. Other structuring of partnerships in PPP have been elaborated by other agencies such as:

## Spectrum of Possible PPPs in Infrastructure & Service Provision



Bradford S. Gentry  
 Yale/UNDP Programme on Public-Private Partnerships (cited in Wit 2013)

Partnerships between the state/government with the community through community organizations have also been referred to as part of structures that allow government to share responsibility with the community actors, increase each other’s strength and capacity and build better accountability structures and practices between the actors/sectors (Krishna 2003). This specific kind of arrangement has been rising in the increase of decentralized service delivery. Its shortcomings though have also remained outstanding especially in the failure of effective community participation, tendencies of corruption and manipulative engagement of communities or patronage structures (Wit 2010).

It is among these reasons that studies have argued that PPPs are theoretically lustrous. Their practical applicability however has often produced a lot of different outcomes from the expected (Pessoa 2008). It is common in literature to find strong emphasis cautioning attempts to apply PPP to every kind of service or context. They may serve successfully in some services, but not all (Brinkerhoff and Brinkerhoff 2011: 13). Awortwi (2004) insists of this situation that there must be proper action to ensure the right conditions for the operation of PPPs are taken before their introduction. They could otherwise undermine the whole service delivery that had previously been done better by the public sector. It is not always that the private sector is more efficient, especially if the ground conditions do not ensure the proper management and regulation of the processes.

The provision of these ground conditions are explained in several theories on the nature of relations developed between/among actors in the processes of collaboration and how they can best perform. These include “Principle-agent theory”, “public choice theory” and “New Public Management”. ‘Principal-agent theory’ calls for separation of the boundaries between the public and private actors for example if in the case of public con-

tracting out to the private. The principal that demands the service must be separate in identity and not very close to the agent. The relationship in that sense, must be impersonal and 'arms-length'. This is followed with close monitoring of the service delivery by the principal over the agent. 'Public choice theory' argues that for better performance, efficiency and cost-reduction, there is need for competition among providers rather than simply contracting out services. In cases of small numbers of providers for example, the framework would be to make the contracting process competitive and the service periods short, regular, articulate and closely monitored. 'New Public Management' on the other hand insists on autonomy of the lower actors in the system. It presumes that the more autonomous the lower ranks are for example local governments from central government, when they have freedom to make decisions, their performance is enhanced. It also requires broader stakeholder engagement to ensure mutual accountability (Awortwi 2004).

In Rwanda's case with water service delivery, the utilities are fully owned by the government. This of course does not include private sources in home like personal boreholes and rain water tanks that are legal in the national framework. The public water utilities are therefore in the hands of Energy, Water and Sanitation Authority (EWSA) for the case of the urban water supply and under Rural Utilities Regulatory Agency (RURA). The government has constructed/installed and maintained these sources for the period before the beginning of private sector involvement in 2009. The sources improved/rehabilitated under WASH fall in the rural areas. Instead of them getting into the operation of RURA, they are handed to private operators on short-term contracts of two years.

These contracts are bid out by the districts where the interested potential providers bid and win the service delivery contract from. These can be private entrepreneurs or community groups/associations. They majorly take the role of water service delivery (operation and maintenance) alone. Only recently is the policy framework (2010) introducing the provision of them meeting some investment, but these are still limited. The water system in the urban areas are divided into two. The in-home stand pipe are managed and billed wholly by the public agency – EWSA. But the public access points (kiosks) are run on the same terms as the rural WASH points. They are also contracted out to private operators for two year periods although there are calls for this duration to be lengthened for more certainty as well as utilize larger private enterprises other than simply community association or local community entrepreneurs (Lazarte 2011). In terms of the Gentry's theoretical frameworks given above then, Rwanda's water service delivery is at the level of service contracts and (operate, maintain and lease). But the theoretical principles ensuring performance are merged with both decentralized management (with increased lower government autonomy), and increasing local stakeholder participation in service delivery – from New Public Management; as well as the Principal-Agent theory of impersonal and arms-length relationship between the principal and the agent and monitoring of the agent by the principal.

## Access to water

The provision of water has theoretically been categorized into two broad forms in terms of patterns of access: (i) access at the natural source (surface or underground) and (ii) access to alternative water delivery (mainly private sector) in water tankers, water carts, or bottled water at kiosks (le Blanc 2007: 3). For the second category, the government usually takes responsibility, often together with NGOs. In Rwanda, both categories seem to co-exist for safe drinking water from the protected and rehabilitated water sources. In urban areas, water has been provided through kiosks and home stand pipes/taps. In rural areas, water has been provided partly at private kiosks from the gravity and power pumped water systems, and partly from boreholes and protected/improved springs. This paper looks into both of these categories of access from the natural source (boreholes and improved springs) and that from the kiosks (both rural and urban) by private contractors under the WASH project operation.

Jooste (2008: 7) explains that the institutional structures in this service delivery and access are classified further into three broad types: a) a public, system, b) a private-for-profit (PFP) system and c) a private non-profit (PNP) system (see each of the cells in Table 1). In the public system, the government installs and owns the water facility and undertake water delivery operations. In the PFP system, the government may or not own the facility, but commercial firms take a full responsibility for water delivery operations. In the PNP system, neither the government nor a commercial firm own the facility or earn profits from the operations. Jooste (2008) excludes non-registered private boreholes/wells that provide water to the owner and some community members with or without profit. Among the three types, Jooste (2008) tabulates the various patterns of water provision in terms of relationships with sources and infrastructure.

		Relationship to source	
		Independent (Develop own source)	Dependent (Source supplied by large utility)
Infrastructure type	<b>Network</b>	- Public: Fully integrated public well - PFP: Variety of PPP arrangements - PNP: Formal non-profit network provider, communal well or borehole	- Public: n/a - PFP: Private sub-network, connected to greater public network - PNP: n/a
	<b>Point source</b>	- Public: Public standpipe - PFP: Private well or borehole - PNP: Communal well or borehole	- Public: n/a - PFP: Fixed location vendor selling water sourced from network or standpipe (or bottled water) - PNP: n/a
	<b>Mobile distributors</b>	- Public: Public tankers - PFP: Mobile tanker water sourced from private well (or borehole) - PNP: n/a	- Public: Public tankers - PFP: Mobile tanker water sourced from private well (or borehole) - PNP: n/a

Source: Kariuki and Schwartz (2005) cited in Jooste (2008).

This paper focused on those systems that were previously communally owned and operated and have subsequently been protected/improved under the WASH project. The study considered public net-

works and point source facilities that had been affected by the introduction of WASH tariff homogenization and private-operators/cost-recovery measures.

We start our discussion of the nature of water as a merit good. In Rwandan communities water has normally thought as a merit good than as an economic good with purely private value that needs private cost coverage for its consumption. On the other hand, the Organization of Economic Cooperation and Development (OECD) reportedly defines water as an economic good basing on its scarcity that requires investment of other scarce economic resources (human, capital, knowledge) to make it available (Opschoor 2006:423-4250). At the 1992 International Conference on Water and Environment (in Dublin) participants agreed that water has an economic value in light of its competing uses.

The effort and costs of water delivery, according to Opschoor (2006), therefore, attracts a thinking of “user-pays principle however, the same observer questions if water delivery as such can fit into such a fully private and commercial definition for several other reasons, even if it is being made to look as a private good through in-home standpipes or bottled water that enable excludability. For instance, the lack of affordability resulting from inequitable income distributions has inhibited adequate access for all to clean water and sanitation. This makes it unfeasible to leave water access to a market-based approach.

Challenging the private water delivery are various factors that constitute market imperfection, such as information asymmetries and inability of markets to account for qualitative and quantitative natural resource depletion. Opschoor (2006) restates that water is an impure public good with significant social costs and benefits (externalities) on production, health, environmental and biodiversity conservation. The desirability of treating water as a merit good therefore is due to the fact that individual choices alone cannot determine water provision or access, considering skewed incomes, consumer “ignorance, irrationality and inadequate time and risk preference” which may not guarantee consumption in the required standards when left wholly to the market. These background issues in addition to the opportunistic behaviour (meaning the drive for profit-maximizing at any cost) of private companies are, according to Jooste (2008: 9-14), what have prompted the increasing emergence of non-profit water provision modalities on small and large scale striving to ensure access to water as a human right.

In addition to regarding water as a merit good, le Blanc (2007: 34-41) argues that there are prevalent normative approaches worldwide that hold the notion that water consumption expenditure should not exceed a certain threshold as a percentage of household income. This defines affordability of water services benchmarked on “minimal” or subsistence water consumption. According to him, while it is understood that the water expenses should not exceed 5% of household income, this threshold is surpassed by most private water service delivery utilities. He states that when comparatively assessed, more than 30% of households in East Asia and 50% in Africa end up with paying more than the 5% bench on water expenses. This, in his view, has often necessitated public subsidization of water services, but even these require better targeting with empirically informed modalities to ensure proper distribution.



Tariff structures suggested by le Blanc (2007: 6-9) reflect two types of cost: variable charge as marginal cost for every additional cubic meter of water; and a fixed charge not tagged to quantity consumed but covering the fixed cost of production and distribution such as connection/installation. He then proposes that variations can be made on both of these types so that one is less or greater than the other for the different income groups to permit for convenience of entry/connection choices and over-time payment of the costs. If fixed costs are so high/not varied, most low-income households may opt not to connect to the water line, even if they were going to consume little quantities thereafter. “Second- and third-degree price discrimination” then can be applied with non-linear tariff menus that differentiate big-volume consumers from low-volume consumers, giving low fixed charges for the latter consumers to motivate their connection, but charge a higher marginal rate. But this is often not easy, and water delivery operators commonly apply the following tariff structures:

- *Fixed Charge* where the bill does not depend on the quantity of water consumed;
- *Volumetric Charge* where the bill depends on the quantity of water consumed;
- *Uniform rate* with all units (cubic meters) priced at the same rate, independent of total consumption;
- *Non-Uniform rate* having units priced differently;
- *Block tariff* with all units falling into certain bounds and “blocks” are priced equally;
- *Increasing Block Tariff (IBT)* where the marginal rate increases with the block;
- *Decreasing Block Tariff* where the marginal rate decreases with the block;
- *Volume-differentiated tariffs (VDT)* in which all units are priced at the same rate, but the rate depends on total consumption;
- *Two-Part Tariff* which is composed of a fixed charge plus a variable charge that depends on the quantity of water consumed;
- *Uniform two-part tariff* where the fixed charge and the volumetric rate are the same for all connections;
- *Differentiated two-part tariff* that has a menu of services with different sets of fixed charges and rates;
- *Fixed Charge plus Volumetric Rate* combines a fixed charge with the tariffs above (e.g. IBT).

In view of all these modalities, the understanding commonly held in developing countries including Rwanda is that water is a common, social and God-given good, making cost-recovery not a suitable/desired objective in its delivery. Yet, this understanding is also dependent on the levels of income as well as magnitudes of water shortage within developing countries.

Utility theory posits that the value attached to a good and the opportunity costs of consuming it determine a person’s choice as to whether to actually consume it or not. Consumers’ choice depends on whether their perceived benefit from consumption as compared to the cost of such consumption (Grossman 1972). In the case of water, even when the nearest water source is not far, and water needs are high for animals, plants and various daily uses, monetary costs can still make it very difficult for the poor to consume billed water from it. This is most likely the case of dire

poverty where there are so many competing demands against the limited household income such as food, health care, and education.

## Poverty

The interface between water service delivery on the one hand and poverty in the measures adopted by the government of Rwanda and its development partners on the other is critical. The mainstream development practice today regards that water - together with education and basic health care - constitute an essential element for human development and poverty eradication. Here, a serious and contentious issue is the role of government in service delivery, especially under the World Bank's development perspective that de-emphasizes the government's role, and emphasizes the private sector's role, by means of encouraging public-private partnership (PPP).

The issues of income distribution, social welfare and social protection used to carry much weight in international development efforts, and governments have formulated various mechanisms of meeting the needs of the poor. Now, government policy measures are increasingly fitted into the market-oriented frameworks with the consideration of cost recovery in others, targeted delivery is designed for the poor, not the rich, to have privileged access to water. Here how to understand poverty and gauge its prevalence in society is a vitally important matter for successfully formulating effective measures for water delivery.

Poverty has been defined and measured in various ways. The most commonly used is the consumption-expenditure measurement. Other conceptions of poverty are those of empowerment and participation as famously represented by the arguments of Chambers (2006). This view seeks to bring out the voice of the poor regarding their need and their poverty conception. The capabilities perspective of Sen (1999) is yet another which argues for the enhancement of the literary capacity, the provision of the enabling environment (for democratic participation, protection of liberties) and access to socio-economic opportunities. In the face of these very many ways of conceptualizing poverty, it is necessary for this paper to treat the issues one by one.

Income-poverty is one popular measurement of poverty which monetizes the problem. Its monetary terms can be disaggregated down to the individual level, with the focus on financially constraining scope and conceptualization. As Laderchi et al (2003) state, however, using some proxies for measuring poverty risks ignoring actual situations of poverty. Most of monetary measurements are over-simplified for convenience. Even aggregate targeting by gender, for example, can hide other deserving factors. A case in point is Ethiopia's work schemes poor and vulnerable women in male-headed households including poor men who were worse than some women were excluded due to practices of aggregation. This makes the adoption or application of homogenizing poverty lines very contentious and inappropriate. Maxwell (1999: 1) also makes similar arguments against 'reductionist' approaches which may compromise ('trade-off') local complexity for uncaring interest in measurability.

To account for differences in sections of the population, across different times or seasons, geographical locations and inflationary changes, McKay and Greenwell (2007: 6) used the Laspeyres price index which sepa-

rates food and non-food commodities, time, location and inflationary changes. Rwanda's poverty measurement has apparently followed these methods as the orthodox and conventional means since, as they say, that is what has been recommended by the World Bank (Republic of Rwanda 2012; McKay and Greenwell 2007: 2)

To relate the issue of poverty to the barriers to access to water in Rwanda, this paper proposes that the resolution to the problem by using the Laspeyres price index remains problematic. It is externally imposed (upon the community whose experiences cannot be fully expressed numerically). It also remains aggregated and too generalizing (not sufficiently accounting for individual differences). It thus has the same potential of masking exclusionary policy implications.

The paper found it essential to investigate personal experiences as well as consider communities' own definitions of poverty and its measurement. The study of how other livelihood situations and experiences affect, and are affected by, access to water in reality, rather than simple calculating costs, should give a practical view for successful policy measures. The control of resource allocation and decision processes in water service delivery, setting of tariffs, among others, also reflect the levels of participation and the strength of community voices, and indicate levels of empowerment and community ownership of the project even if it is privately operated. This is an attempt to bring together the participatory approach to poverty conceptualization and the money-metric measures. The capabilities/human development perspective that looks at access to basic services (water as well as other essentials such as education and basic health care) is undeniably useful and relevant as a desired end, but not a sufficient measure unless it disregards the participatory/empowerment and money-metric dimensions.

### **Analytical framework**

On the issue of cost-recovery and water tariffs, neither the government of Rwanda nor SNV provides a threshold (maximum bill to income proportion) in Rwanda. Rather, SNV has only stressed the cost-recovery for sustainability (SNV 2013: 9). Moreover, the cost-recovery itself is not specific of which costs (initial capital investments, operation costs or both and for how long

The World Bank defines cost-recovery as:

'the ability of a service provider to take in sufficient revenues from customers to cover their current and some of their future costs. These include operations and maintenance costs (to deliver the service) as well as capital costs (including recuperation of asset depreciation over time and savings to pay for future capital investment needs).'

(Rodrigues et al 2012: 20)

And the World Bank also explains the purposes of charging water fees:

'[they] are collected from users for two main objectives ... to cover the direct financial cost of the service to guarantee sustainable services ... (which) cover basic operation and maintenance of the service, the renewal of existing infrastructure, and the possible capital expansion of water services.'

(ibid.)

SNV expresses “accessibility to safe drinking water” in terms of numerically expressed distance to it. More specifically, it considers water is accessible, when it is 500 meters or less from the household (SNV 2013: 5).

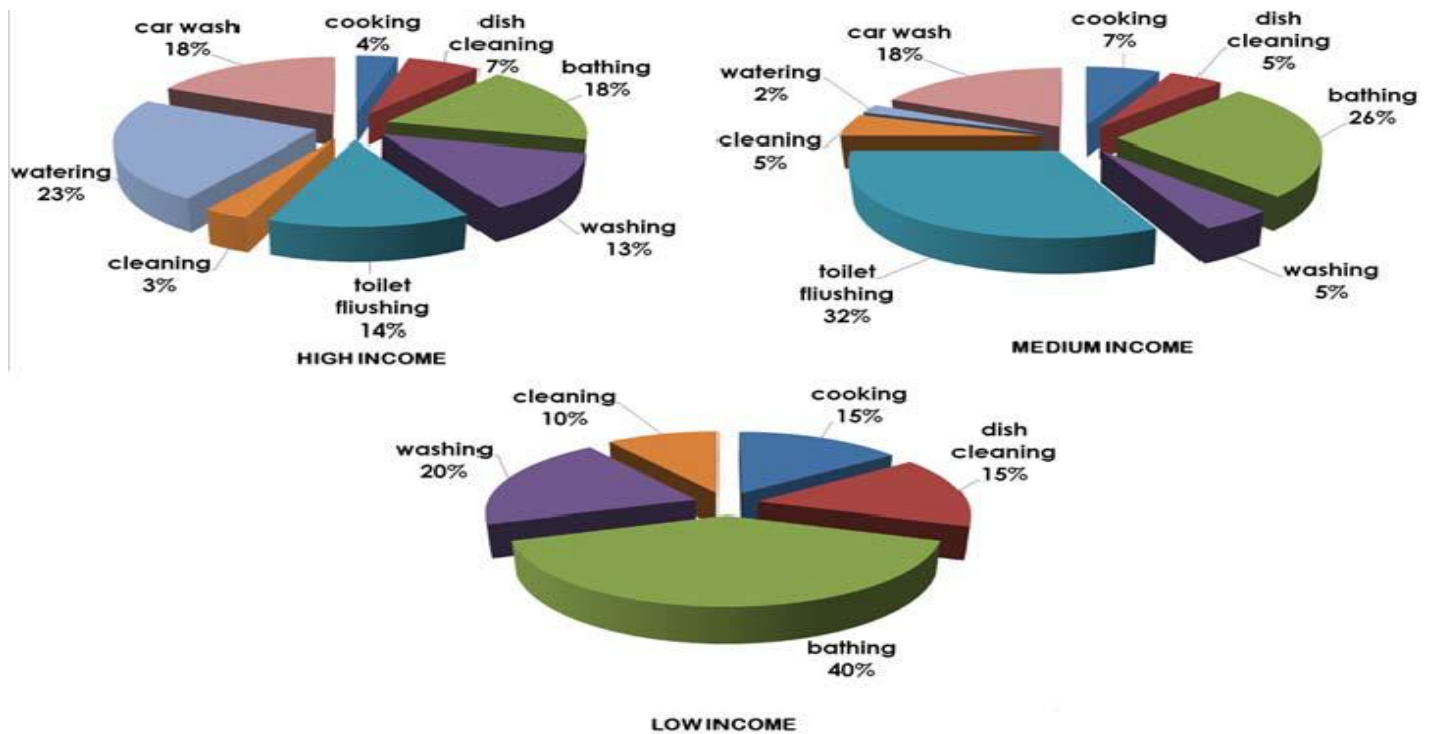
This definition, however, does not adequately answer the research question of the effect of the bill/water-tariff, as the distance from a particular water source cannot be the sole issue determining the actual utilization of water. Given the fact that affordability is crucial, we must take into consideration the monetary measure applied in cost-recovery as by the World Bank’s definition above.

The analysis employed here, therefore, compares the ability of all the varied income groups to utilize/consume water while maintaining the capacity to purchase other livelihood needs within reasonable balance. For instance, as le Blanc (2007) states, a measure of 5% or less of household income can be taken as acceptable as one popular ‘normative’ threshold. We may undertake the analysis measuring the difference between the required/ideal and actually utilized/consumed volume of water, and the actual change between the amount/volumes previously consumed before introduction of the water-tariffs and the volume consumed now (after introduction of tariffs).

There is no universally accepted standard as to how much water a household or a human being needs daily for “normal living”. This is mainly attributed to the existing wide variations in weather/climate that affects dehydration rates, rates of body exercise, body sizes as regards drinking water; and for household use, all those still apply in addition to household production and general livelihood means where water is needed. The city of Melbourne, however, devised a “Household Water Use Calculator” to assess appropriate use, and indicated some points of wastage (where water is unwisely/uneconomically spent) like leaving the tap flowing while brushing without capturing the water or stopping it (City of Melbourne 2003). This was adopted in the study as a measure to filter out possibilities of previous wastage/excess spending as opposed to actually needed consumption that needs not be infringed upon.

Umuhoza et al. (2010) measure household water consumption in Rwanda (quality and quantity) using a consumption coefficient (CoK) having divided the households into three income and housing categories as below:

**Water consumption/utilization ways by household categories**



(Source: Umuhoza et al. 2010)

The framework used by Umuhoza et al. (2010) is interesting for waste water management. They do not consider drinking water, livestock watering and construction, for example, among the other very important uses of water in Rwanda. This paper takes that into account on top of the eight identified aspects from Umuhoza et al's study.

		Relationship to source	
		Independent (Develop own source)	Dependent (Source supplied by large utility)
Infrastructure type	<b>Network</b>	- Public: Fully integrated public well - PFP: Variety of PPP arrangements - PNP: Formal non-profit network provider, communal well or borehole	- Public: n/a - PFP: Private sub-network, connected to greater public network - PNP: n/a
	<b>Point source</b>	- Public: Public standpipe - PFP: Private well or borehole - PNP: Communal well or borehole	- Public: n/a - PFP: Fixed location vendor selling water sourced from network or standpipe (or bottled water) - PNP: n/a
	<b>Mobile distributors</b>	- Public: Public tankers - PFP: Mobile tanker water sourced from private well (or borehole) - PNP: n/a	- Public: Public tankers - PFP: Mobile tanker water sourced from private well (or borehole) - PNP: n/a

Source: Kariuki and Schwartz (2005) cited in Jooste (2008).

The institutional structures in this service delivery and access are classified further into three broad systems by Jooste (2008: 7). They include: a) public, b) private for-profit (PFP) and c) private non-profit (PNP). The public system essentially means the government installs and owns the water

facility assets. The PFP system can own or not own the facility assets, but water delivery is entirely a responsibility of the private actor and as a commercial enterprise. The PNP system on the other hand neither privately own the assets and nor earn and distribute profits from the operations. Jooste (2008) excludes private boreholes/wells that are individually owned and provide water to the owner even if they might serve a few more community members at no profit, but are not registered officially as non-profit agencies. Their asset ownership is certainly clearly recognized. Among these three categories, Jooste (2008) tabulates the various patterns of water provision in terms of relationships with sources and infrastructure. (Comment: The table in the previous page should be placed after the paradigm above.)

This paper focuses on those systems that were previous communally owned and operated and have subsequently been protected/improved as well as those that have been rehabilitated under the WASH project. Due to the homogenization of water tariffs for all water source types, the study considers all previous public network and point source facilities affected by the introduction of WASH tariff homogenization as well as private-operators/- cost-recovery measures.

The paper starts with the standpoint that water has been regarded in Rwandan communities as a merit good rather than as an economic good with purely private value, needing private cost coverage for its consumption. Opschoor (2006: 423-425) presents the view of the OECD (1987) that defines water as an economic good basing on its scarcity that requires investment of other scarce economic resources (human, capital, knowledge) to make it available. This also follows the Dublin 1992 international conference on water and environment that asserted that water has an economic value considering its competing uses.

The consideration of water as a merit good traces to Opschoor (2006) as earlier referred, who disputes the 'user-pays' principle since water is as an impure good may not fit into a fully private and commercial definition despite the trends trying to make it seem private through in-home standpipes or bottled water that enable excludability. Inequalities in income distribution that affect affordability inhibits equitable and adequate access to clean water for the whole population. This renders it unfeasible to leave water access to a market-based approach.

le Blanc (2007)'s argument of the prevailing normative measure of water consumption expenditure not exceeding a 5% of total monthly household income is taken into consideration here. This is considered in both variable charges as marginal cost for every additional cubic meter of water; and a fixed charge not tagged to quantity consumed but covering the fixed cost of production and distribution such as connection/installation. Tariff structures are analysed or classified in terms of the differentiation given by le Blanc in the order as covered in the previous chapter hence: fixed charge, volumetric charge, uniform rate, non-uniform rate, block tariff, increasing block Tariff (IBT), decreasing block tariff, volume-differentiated tariffs (VDI), two-part tariff, uniform two-part tariff, differentiated two-part tariff and fixed charge plus volumetric rate.

## Chapter 3 Rwanda's water and poverty context

Rwanda is a country with an admirably beautiful environment and other attractions drawing a lot of tourists, although its beauty is accompanied with various local difficulties. Its hilly landscape, for example, makes it very difficult for local residents to travel far. While several mountain water springs are known to exist in the country, its hills often prevent communities from getting access to them. As a result, many communities resort to the nearest running streams or rivers rather than these springs. Hickman (2013) documents that long queues at boreholes sometimes oblige community members to go to streams. In his research, Uwera (2013) further points out that the waiting time for water by community members means a loss on their income, that the resort to alternative unsafe sources may cost them an additional income loss in the long run with disabling disease contractions.

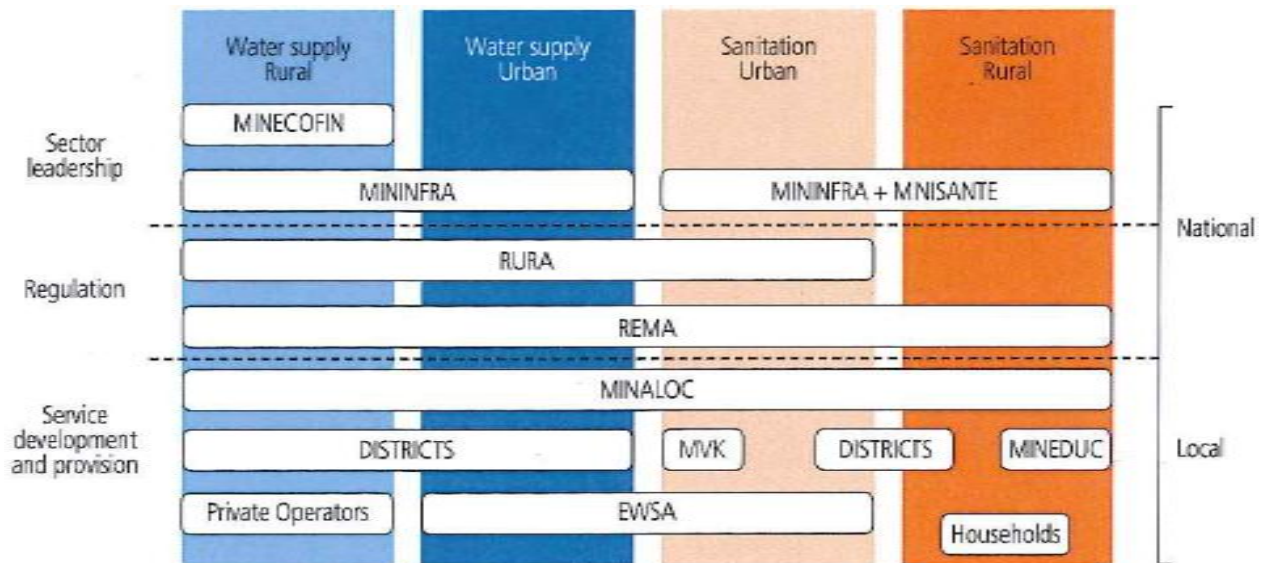
Rwanda's strategies, policy and institutional frameworks in the water sector are strongly derived from international development frameworks, particularly the Economic Development and Poverty Reduction Strategy (EDPRS) and the Millennium Development Goals (MDGs). The government has been commended for its strong political commitment to these development frameworks (World Bank 2012: 1). This commitment is reflected in the priorities and strategies set in Rwanda's sector strategies and policies (see, for example, the Ministry of Infrastructure 2010: 5, 13, 33). The government attributes the successful delivery of water services to the public-private partnership (PPP) arrangements that it has built with its development partners in the water sector. In this regard, the government's Rural Utilities Regulatory Agency (RURA) has monitored the water service delivery, including tariffs, contract management and monitoring (ibid. 9, 12, 18, 52). While the policy looks convincing, the effectiveness of its regulation/oversight and monitoring does not seem to stand on the sound ground. (The next chapter of this study explores its shortcoming.)

Rwanda is faced with are numerous challenges, including not only the afore-mentioned geographical factors but also many others. For instance, some reports point at the failures of attempts to construct rain water harvesting facilities caused by the crumbling of soils. Other statistics report that nearly 70% of Rwandans still get water from open sources, mainly streams and rivers (Charity water 2012: 1). The government's officially publicized figure of overall safe water coverage is at 65% in 2012. Yet, it also acknowledges that residents of several Rwandan communities must walk up to some kilometres in un even terrains to fetch water. It is documented that in Rwanda, women and children spend at least 29 minutes a day in collecting water for their household use although they consume only between six and eight litres per capita (SNV 2013: 5). Yet, Rwanda is acclaimed as one of the Sub-Saharan African countries for impressively improving the living conditions as well as overall development through effective service delivery including water (Commonwealth Local Government Forum (CLGF) 2013; World Bank 2012: 1).

The water management institutional framework in Rwanda today is as presented in the diagram below:

Figure 2

Institutional structure of water service delivery in Rwanda



(Source: World Bank 2012: 14)

The Rwandan policy framework has placed rural water supply increasingly in private operators' hands. On the other hand, the urban water system has remained under EWSA just as does the sanitation systems management. In reality, we have found that even the EWSA urban water systems run on a PPP or quasi-private model. The home stand-pipes extended by the agency to private residences are billed directly by it. The public access kiosks are contracted out to private operators just in the same manner as the WASH water sources are in the rural areas. All in all thus, all water service delivery in Rwanda is increasingly on market basis now, be it rural or urban. Thus, the PPP operation modalities are now being extended to the rural areas, shifting the whole country to the market system.

The currently available statistics from the government indicate 74% national coverage of access to safe drinking water by 2011 (Republic of Rwanda 2013a: 7, 70). Integrated Household Living Conditions Survey (2010/11) more specifically shows that 74% of the households in the Musanze district use improved water sources, including protected springs, public standpipes, water piped into dwelling/yard, boreholes, protected wells and rainwater collection. The survey further reveals that 60% of the households use public standpipe or water piped into dwelling/yard. These Musanze figures in the survey are the lowest among the districts in the Northern Province. The highest rate is observed in Gicumbi (89.4%), followed by Burera (76.8%), Gakenke and Rulindo (both at 74.6%) (Republic of Rwanda 2013c: 7-10).

Contrary to our expectation, the survey (EICV3) indicates that the Musanze residents on average walk the shortest distance to the nearest safe water point compared to those in the other districts in the Northern province (9.7 minutes average), with 51.4% of residents walking for 15 minutes and 5.2% more than 30 minutes to the nearest improved/safe water source (ibid.: 9). It is an intriguing observation in the case that Masanze among all



the Northern Province districts has the least average walking distance to the safe water points but also comparatively has the lowest percentage of its population using water from safe water sources. Residents in other districts walk longer distances to the water points but higher proportions of them use water from safe water points than in Musanze.

SNV (2013: 6-7) reports that Musanze is the most intensively served district in the Northern district. The delivery has covered 88% (34,305) of the Musanze population previously (before 2009) unserved with safe drinking water from rehabilitated water points. There are recorded to be only 12% (4,600) remaining to be covered by the end of December 2013. This is in contrast with Burera which is the second WASH operation districts, only 49% (6,413) of the targeted population has been covered and the remaining 51% (6,633) is projected to be covered by the end of 2013. It could be presumed that Musanze should have had the highest proportion of its population using water from safe water points since the project has provided the greatest proportion of its population with safe drinking water points. But this is not the case as seen earlier from the EICV3 (Republic of Rwanda 2013c: 7-10).

Furthermore, Burera has only 36% of its population walk 15 minute or less to the nearest safe water point, and 21% more than 30 minutes. The average walking distance to the nearest safe water source is 18.2 minutes, which is above the national average of 14.4 minutes and only second to 20 minutes of the Gicumbi district. Yet in terms of the population using water from safe water points, Gicumbi with the highest average walking distance among the districts of the Northern Province has the highest proportion of population using water from safe water points (89.4%). Musanze that has the shortest average walking distance (9.7 minutes) only has 74% of its population using water from safe water points (see Republic of Rwanda 2013c: 7-10; 2013d: 16-19; 2013e: 7-10). This is such a paradoxical scenario. It could potentially be argued as a case of over-reliance on averages or improper use of data with many overlooked problems that get neglected. These issues are explored in the next chapter in considering access to water in terms of distance with contrast to tariffs, time and need or water uses/purpose among others.

Various international organizations and donor governments have supported the government of Rwanda in its development efforts. Its development targets include: to reduce the country's poverty by 2015 in line with the Millennium Development Goal (MDGs) 1 and Rwanda's own vision 2020. For Rwanda, two outstanding development partners are the Dutch government (represented in Rwanda by the SNV) and UNICEF which focuses so much on children's education and health services. These development partners have formed a team to support the "Water Sanitation and Hygiene" (WASH) project. The WASH project has concentrated in four districts, two (Musanze and Burera) from the Northern Province and two (Nyabihu and Rubavu) from the Western province. This project, which started in 2009, is expected to last until the end of December 2013, with the target of giving access to safe water to 500,000 people (SNV 2013).

In the Rulindo district of the Northern province, some NGOs are also supporting the water service delivery campaign of the local government known as the "Rulindo Challenge", to accomplish the 100% coverage of safe water delivery by 2014 more ambitious than the government's long-term target of 2020. This is expected to be achieved through provision of

two new water systems and rehabilitation of five other old ones. The pipe network will then be extended through villages, schools and health centres to give the community access, with the expectation that a total of 26,000 people should access safe water from this intervention. The project is, however, only focused on Ngoma and Shyorongi sectors within Rulindo, from which it is expected to roll over to other sectors with a total budget of US \$ 1.7 million (Charity water 2012).

As mentioned earlier, one aspect common in all the water sector interventions in Rwanda today is the trend toward market-based delivery model of operation. The water sources and systems set up or rehabilitated are all contracted out to private operators that charge a fee for the water and take charge of maintaining the water points. Nevertheless, it is still widely believed that everyone in Rwanda should have access to this safe water, and be able to participate, as the joint owner of the project, in the determination of its provision modalities. The WASH partners, for example, have taken on four principles in their intervention:

- 1) Inclusive WASH policies
- 2) Market based service delivery
- 3) Knowledge networking
- 4) Community participation

The WASH partners have indicated that the intervention is supposed to ensure that first of all, all Rwandans regardless of their income will access safe drinking water; second, communities will participate in the decision making on water tariffs and services; and most importantly, third, all tariff disparities in all areas and types of water systems will be harmonized so that the same rates prevail across board (SNV 2013).

What is very clearly understated is the ability of the government system to regulate this delivery as well as effectively monitor compliance to specific measures and fair service delivery outcomes. This is interesting because in water service delivery, the government has expressed its major challenge in its Water Resources Management Sub-Sector Strategic Plan (2011 – 2015). These challenges include: meeting increasing multiple water demand while dealing with declining water quantity and quality, and coping with inadequate governance framework. Yet the government has all the same committed to reaching 65% overall water service coverage by 2012 and 100% by 2020 (Ministry of Infrastructure 2010: 5) in more recently announced accounts, the targets are 85% by 2012 and 100% by 2020 (Republic of Rwanda 2013c :). By so doing, the government expects to cut the level of poverty in Rwanda by half by 2020 (Charity water 2012

### **Rwanda's poverty status**

EICV3 in the thematic analysis on income reported that near 50% of all income in Rwanda comes from agriculture, the sector that is the only source for the poorest of its population. For the segment, personal farming constitutes 98% of agricultural incomes and only the remaining 2% are wages from employment in others' farms (Republic of Rwanda 2013b). On district profiles, the survey reported the Musanze district as having a total of 416,000 residents, constituting 21% of the Northern Province and 3.9% of

Rwanda's total population. An average household size of 4.8 was established, ranging higher than some predominantly rural districts.

Poverty measurement in the Musanze district used two methods; the household food consumption basket and the extreme poverty line in terms of the cost of buying the food consumption basket, presuming that nothing was spent on non-food consumption. The figures were set at 83,000 Rwanda Francs for the household consumption basket, and 118,000 Rwanda francs for the extreme poverty line. By these measures, the survey came out with 79.9% of the Musanze population categorized as non-poor, 14.2% as poor and only 5.9% as extremely poor. The survey also shows that the Musanze district has the highest percentage of non-poor in the Northern Province. (Republic of Rwanda 2013c).

On the other hand, the World Bank's development indicators for 2011 showed that Rwanda's GDP per capita was only US \$ 582.5. The overall poverty headcount showed 82.37% of the population being below that cut-off line of \$2 a day (PPP). When put to the local rates, the poverty headcount ratio stood at 48.7% of the rural population and 22.1% of the urban population. The national proportion of people below the poverty line is 44.9% (World Bank 2013). This focused on monetary measures of poverty, which have been much criticized for not comprehensively representing the state of real poverty prevalence as well as of deprivation in life.

The Human Development Report 2013 placed Rwanda in the low human development category of countries. The overall index stood 0.434, putting Rwanda in 167<sup>th</sup> position out of the 187 countries surveyed, even below the average among the countries belonging to the low human development category, i.e. 0.466, . It was also below the average of 0.475 for countries in Sub-Saharan Africa. The report also indicated that 63.2% of Rwanda's population falls below the PPP US \$ 1.25 per day. Yet in terms of the multidimensional poverty index (MPI), the reality is even worse. The MPI is 5.8 percentage points above income poverty, which gives Rwanda a 69% score (by the headcount ratio) living in multiple deprivations. The worst among the constituent factors is the living standards at 49.6%, followed by health at 30.9% and then education at 19.5% (UNDP 2013).

The perspective we find in Rwanda's case is of a country that has high reliance on international frameworks for its service delivery with close support from the international development agencies. In implementation, there are unclear facts. The government on one side is claiming high performance in coverage of safe drinking water access and high hopes of completion soon. Studies by both government itself and other development agencies indicate that despite the increasing coverage, there are still considerable proportions of the population that are not utilizing the safe water sources. Musanze district in particular stands out as a case of this paradox. On the poverty indicators, there is still a high prevalence of poverty. The MPI measurement approach taken by UNDP makes the situation more worrying. In spite of that situation, the country is opting increasingly for market-based/oriented service delivery and in critical services like water. That may not be the worst undertaking, but the more intriguing one is that of homogenizing tariffs across all areas and types of water sources. This puts off the possibilities of differentiating people's situations by levels of income and poverty. The presumption that all will afford or have equal access proves to have gaps when evidence is showing us that access may actually need to be reconceived and poverty be seriously considered.

## Chapter 4 WASH Project in Rwanda

The Water Sanitation and Hygiene (WASH) project is a five year (2008-2013) partnership project between the governments of Rwanda and the Netherlands (represented locally by SNV and UNICEF). Rwanda is one among the seven East and Southern African countries engaged in WASH service delivery model. This is a drive towards accelerating access to water in developing countries under the Millennium Development Goals (MDGs); increasing the level of human development by halving the number of people without access to safe drinking water by 2015. The Dutch government is contributing 81% of the cost of the whole project, the Rwanda Government 10%, UNICEF 6% and the communities 3%, all totalling to US \$ 21.44 million.

The Government of Rwanda is represented in the partnership by the Ministry of Infrastructure (MININFRA), where EWSA and the National Project Management Unit (NPMU) take on the technical bit of construction/rehabilitation management and thereafter, the processes of contracting to and regulating the private operators. The Ministries of Health (MINESANTE), of Education (MINEDUC), and of Local Government and Community Development (MINALOC) come into play on issues of health centres, schools and community engagement in the project.

The local governments are involved at the provincial levels as Inter District Steering Committees (IDSC) to support the district WASH Teams (DWTs) who undertake the planning and implementation of the WASH Project within their districts. The sectors, cells and Umudugudu<sup>1</sup> are convened into community WASH committees; participation hygiene and Sanitation transform (PHAST) committees for grass-roots mobilization and representation. Other local and international NGOs and agencies are also engaged mostly in contractual and consultative arrangements (SNV 2013: 5).

My study involved the visit to Mugeshe cell in Muko sector as a case study, and to Cyabaranka cell in Mukoto sector as another case study. The former is for the rural situation and the latter is for the urban situation. The difference between the two locations is that the water sources in Mugeshe (rural) have been improved/ rehabilitated under the WASH project. Whereas these in Cyabaranka (urban) is outside of the WASH project, operating instead strictly under EWSA. There are two different flows of water in the urban areas. The piped system that goes up to people's own houses is billed directly by EWSA. EWSA also sets up kiosks which distribute water at common location points other than people's private homes. Private operators/agents are contracted to collect the fees at these kiosks that are open to the public. In terms of actual operation, EWSA operations may not be much different WASH operations. Let us note that the WASH project does not have operating facilities in the urban areas. The study incorporated the EWSA operated urban water points for the contrast of experiences and testing of urban experiences and the presumed arrangements of homogenizing all tariff structures across systems. It was of interest to investigate how

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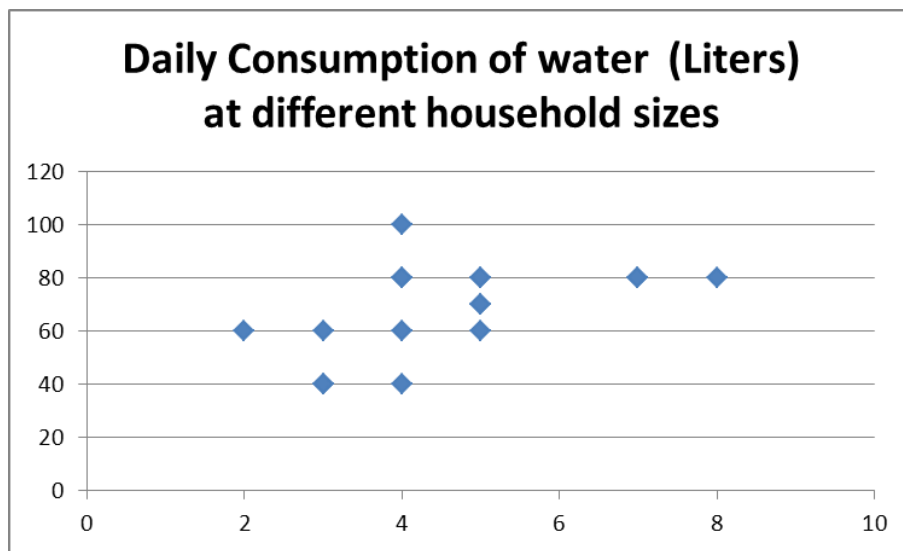
<sup>1</sup> Umudugudu is Rwanda's lowest administrative unit, organized at the village level.

different its operation systems would be from WASH. Yet, it should be reminded that EWSA is a key partner in the WASH project in rural areas.

### Water utilization patterns: my field study

In the communities I visited, water is almost entirely for domestic use, except for watering livestock. The latter use, however, is found only few cases so l that it would not make much difference in the overall use. All the respondents of my study reached indicated water is mainly for home use, i.e., drinking, cooking, bathing, and washing utensils and laundry. Watering livestock was for cows, except in one respondent who use water for a piggery project. The study encountered no industrial use, irrigation use or other large scale agriculture or construction. The daily water usage of the respondents was low, at 67 litres per household on average, an equivalent of roughly three gallons/jerry-cans.

Figure 2



Source: the Author

There could be variations in actual numbers of litres consumed. But the measurements here were taken in terms of gallons of 20 litres that are commonly used in the community. These were then converted by the researcher into litre-equivalents so as to make comparative observation of quantities across the population easier and more understandable.

An interesting finding of the survey is that households of two members consume up to 60 litres of water a day just as those of three to seven members do. How could this happen? Similarly, households four members consuming up to 80 litres just as those of five to eight members do. It is difficult to explain comprehensively what makes such similarities in water consumption among households of different sizes. This finding indeed challenges the understanding of the certain quantity of water a household or a human being typically uses daily for a “normal” living. Just as the water flow varies widely in accordance with the weather/climate which affects dehydration rates, differences, within and among households, of rates of body exercise and body sizes affect the volumes of water consumed for drinking, bathing and hygiene practices (City of Melbourne 2003).

The minimum daily consumption recorded was 40 litres in two households of three members and one of four. There may be a temptation to easily attribute this to the small size of these households. But, again, let us note that the smallest households of two members use 60 litres. This is not to argue that household size does not matter in affecting the quantity of water consumed. Rather we point to the danger of exclusively focusing on the household size as the factor to determine the quantity of water consumption. We certainly have to look into the actual purposes of water consumption of individual households.

### **Water provision and access (The field survey in Musanze)**

Water access is still a problem in Rwanda. While the government and the development partners in WASH emphasize that the distance from the households to their nearest water source should be not more than 500 meters, the average distance calculated from the study was 828 meters. In fact, 56% of the respondents of my study walk more than 500 meters to their nearest water sources (see the table below). :

**Table 2**  
***Distance to the Nearest Water Source***  
***(Distribution of the Respondents)***

<b>Distance (meters)</b>	<b>Distribution</b>
100 - 500	44%
501 - 1000	39%
1001 - 2000	17%

Source: Data from my field study

These findings are not consistent with the estimates of the SNV and WASH partners that the water access within the 500 distance from home is reportedly more than 80% at the end of 2012. It seems that these service providers overestimated their achievements. Similarly, these partners uphold the blueprint of the nation-wide targets of 65% access coverage by 2012 and 100% by 2020. Indeed, the derivation of average figures and the measurement of distance deserve careful re-thinking. Caution therefore may be warranted in using these findings. If the measures nonetheless remain valid, then there is certainly a serious problem of water access in Rwanda, far much more than estimated by the government or its development partners.

Many respondents living within the radius of 500 meters from the water sources expressed significant levels of satisfaction. The common responses were:

‘This is better compared to the past.’

‘Water is at least available and nearer now.’

(Sources: Responses from my field interviews)

However, others even if they lived near the water sources still expressed concerns about instability of supply. Many respondents complained about lesser availability of water during the dry seasons, as well as breaking down of water pipes. Many complain about long lines of waiting, which

tend to become even longer, and some of them opt for distant sources or open streams to get water for domestic uses other than drinking and cooking. This in a way confirmed the issues posted by Charity water (2012) that finds about 70% of Rwanda's opting to get water from unsafe sources. It equally puts light on the 29 minutes a day pent by women and children in collecting water (SNV 2013: 5).

It is this issue that apparently remains much more silent in government reports including most documents of the international development agencies. The is effort to reflect the coverage as high without discussing the congestion experienced at water sources/points for example. This accounts for the time spent by women and children and may account for water access itself. Community members may find convenience in utilizing unsafe water sources due to constraints on time and effort needed to wait at the protected or rehabilitated sources. It is important otherwise that such time lost needs to be fully counted in considering the access to water. It has to go beyond the physical distance from the household to the source of less than 500 metres. New variables are need here and new indicators.

The emphasis the paper makes from such assessment is that estimating access to water by using only distance may be misleading. Other issues are crucial too, just as the population question above highlights. Needless to say, affordability (i.e. price) is obviously a critical factor affecting water accessibility. Reasonable prices are key in ensuring water access apart from the water-household distance. Let us further consider this aspect in the next section.

### **Water Tariffs**

Following le Blanc (2007), let us take the cost equivalent to 5% or less of household income as the criterion for water affordability. This means that in the normal situation, a household consumes 5% or less of its total household incomes for a given period, say, in a month. .

The household incomes of the communities under the study are low. The average household earns 22,000 Rwanda Francs, or equivalent to US\$ 33 per month. Yet on average the monthly cost of water is 1,400 Rwanda Francs, or equivalent to US\$ 2 per month, or about 6%, slightly above the -threshold of 5%.

In our study in Musanze, one household spends up to 48% of its income on water bills, making it impossible for it to meet all their essential needs apart from water. Majority of the remaining households spend still above the 5% threshold, i.e. between the 6% and 12%, of their incomes on water, while a few households spend 5% or less.

**Table 3**  
**Tariffs as proportions of income**  
**In the respondents of our study in Musanze**

<b>INCOME</b> (Rwandan Francs)	<b>WATER COST (Few.</b> Francs per 20Lt gal- lon)	<b>Daily Qty Con-</b> <b>sumed (Gallons)</b>	<b>Daily Cost</b> <b>(Rfw. Francs)</b>	<b>Monthly cost</b> <b>(Rfw. Francs)</b>	<b>Proportion</b> <b>of income</b>
5000	20	4	80	2400	48%
15000	20	3	60	1800	12%
20000	20	4	80	2400	12%
10000	10	3.5	35	1050	11%
12500	10	4	40	1200	10%
10000	10	3	30	900	9%
30000	20	4	80	2400	8%
20000	10	5	50	1500	8%
8500	10	2	20	600	7%
15000	10	3.5	35	1050	7%
10000	10	2	20	600	6%
40000	20	4	80	2400	6%
20000	10	3	30	900	5%
20000	10	3	30	900	5%
30000	10	4	40	1200	4%
45000	20	3	60	1800	4%
35000	20	2	40	1200	3%
60000	10	3	30	900	2%

20	EWSA Water points still operated by Private contractors
10	Water points operated by WASH private contractors

Sources: Data collected in the field

Our survey samples indicate that the tariff is excessively high for the greater part of them. Only a third of our respondents spend within the acceptable threshold of income on water, and the remaining other two-thirds pay more. The situation of the proportions of monthly water expenses to household monthly incomes is summarized in the graph below.

The usual problem that needs critical perspectives in such studies is of course the reliability of interviews to generate actual facts/realities regarding people's incomes or even worse, aggregate household incomes. This is most complicated by the fact that most of the community members are agricultural or at least related income source dependent. These are precarious sources of income which are hardly accurately provided. But in the event that the government itself nor any other agency has had a different/objective way of generating data on incomes of people except through such surveys and there are no documented records of earnings, it is still the same measure we shall rely on.

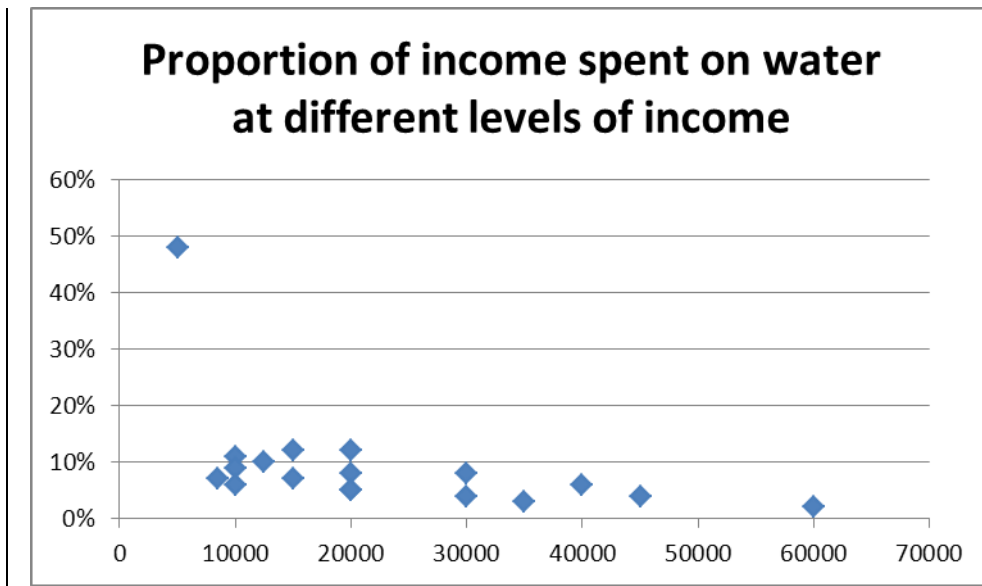


If we took the UNDP measure that located 63.2% of Rwanda’s population below the PPP US \$ 1.25 per day in terms of one-dimensional measures (UNDP 2013). We find the rough estimate of US \$ 37.5 per month presuming at least that each of those below the poverty line were just at the minimum line of US \$ 1.25 per day. With an average consumption of 99 gallons per month, the cost in Rwanda Francs would be 1,980 per month for those paying 20 Rwanda Francs per gallon at the EWSA sources or 990 Rwanda Francs for those paying 10 Rwanda Francs per gallon under the WASH project sources. Converted into dollars, it gives a US \$ 3 per month for those under EWSA sources and US \$ 1.5 for those under WASH sources. As a proportion of the average monthly income estimating that everybody earns just US \$ 1.25 a day, we get 8% of income going to water for those under EWSA and 4% of income for those under WASH.

Here one would argue that the charges are a little reasonable. But two points have to be stressed here. The first one is that we cannot set an average of everybody who is categorized as falling below the US \$ 1.25 per day as actually earning the US \$ 1.25 per day. The second point is that we cannot also take the average of water consumption as the quantity everybody consumes and so spends just that amount. Using averages highly misleads us from seeing issues suffered by the poor as we only presume everybody is okay. This is most risky if one’s survey finds a larger proportion of the respondent population falling under the non-poor category.

Using the actual findings of the study thus, we can relate some of the experiences with reference to the divergences people suffer in terms of income consumed in water expenses.

Figure 4



Why the difference exists between the charges in the EWSA sources and those at the WASH sources is something that originated historically from the public nature of the EWSA sources. They were billed following the public system and they have not been the free communal kind of access that exists in the WASH rural sources. The introduction of fees in the rural sources besides, has been supported by the input of the donors in maintaining the systems and just initiating it makes ambitious changes to raise prices

not common yet. Whether such scenarios will be guarded against in the rest of the time to come remains another thing to observe. But the expenses the communities incur in the EWSA sources were not hidden. Two responses from our samples exemplify the general view of the population on the cost of water in EWSA sources:

“Water from EWSA sources is expensive and the authority has not done anything about it.”

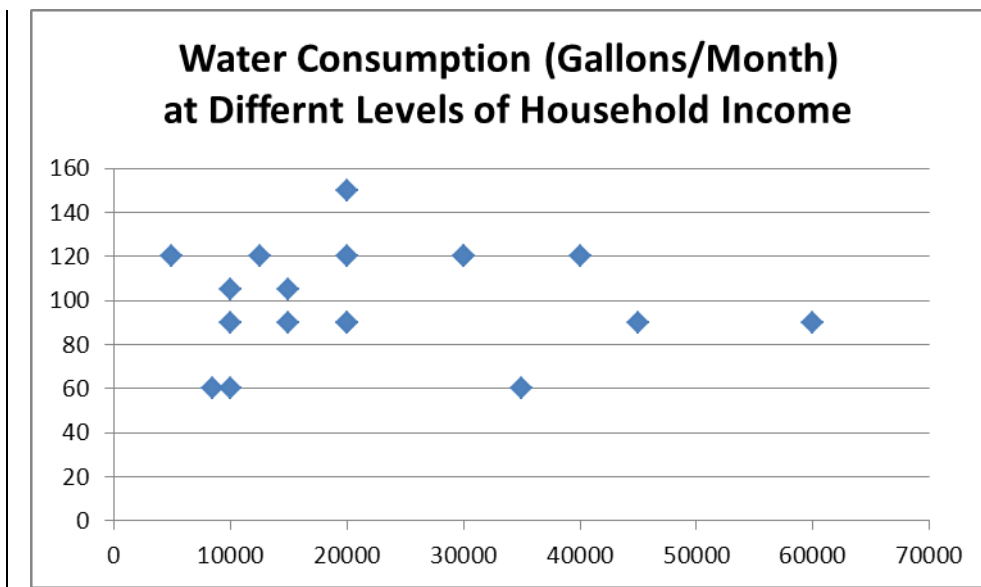
“I hardly afford paying for it.”

(Responses from our field interviews)

The difference is certainly also with the location, where urban water needs are deemed to be higher and so charges are higher based on the demand. But the other fact is that they are not the same common access avenues for all. Several and potentially those that would influence policy to shift downwards access water from their in-home standpipes. It leaves the poor who cannot connect themselves vulnerable to prices they cannot easily affect.

It should be reminded that the households that suffer most from the high water tariff are not necessarily the ones that consume most water. The graph below demonstrates.

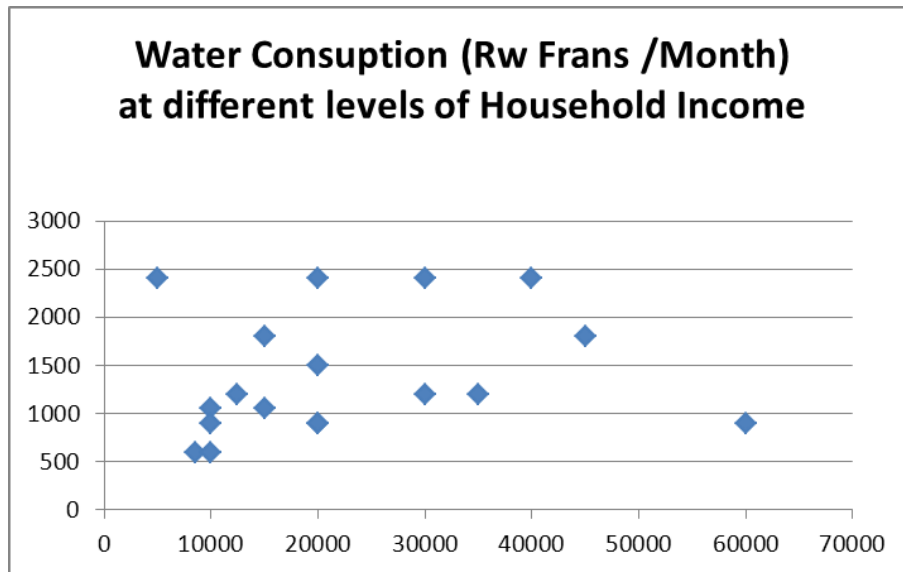
Figure 5



As pointed out earlier, one household in my study that loses 48% of its income on water by consuming 2,400 liters per a month, while households lose only 12%, or 8% or 6% of their income on the same amount of water consumption.

The problem that emerges by genuine assessment, is beyond just consumption. It tends to be a problem of disregarding the differences and variations in income levels across households. The household suffering from the 48% burden of income to water bills on 2,400 liters of water pay the exactly same amount of money on the water bill as all the others that consume the same amount, but it does pay much more as a proportion of its income. The graph below puts more clarity to the issue.

Figure 6



It is perhaps not equitable to charge equally households regardless of their income levels if they use the same amount of water.

It is presumed as may in most cases be anyhow, that households of a larger family size tend to consume more water. However, in our field, they do not necessarily consume larger quantities of water. We found in fact that large households may consume the same volume as, or less than, smaller households here, what is important is not the household size as such but the per capita income of the household. In other words, smaller households can afford to spend larger (even in terms of absolute amounts of quantities of water) than larger households if their per capita income is higher. For instance, households of 2 members may consume more per capita than those of 5 members if the former has a much higher household income than the latter. There is a prevalence in a way of the need/usage of water determining how much a household consumes more than just the household size. It is further affected by the income levels of the household. This supposedly in the event that the household incomes are low and the water needs are more may give reason for the high proportions of the water expenses to household income observed in the cases captured.

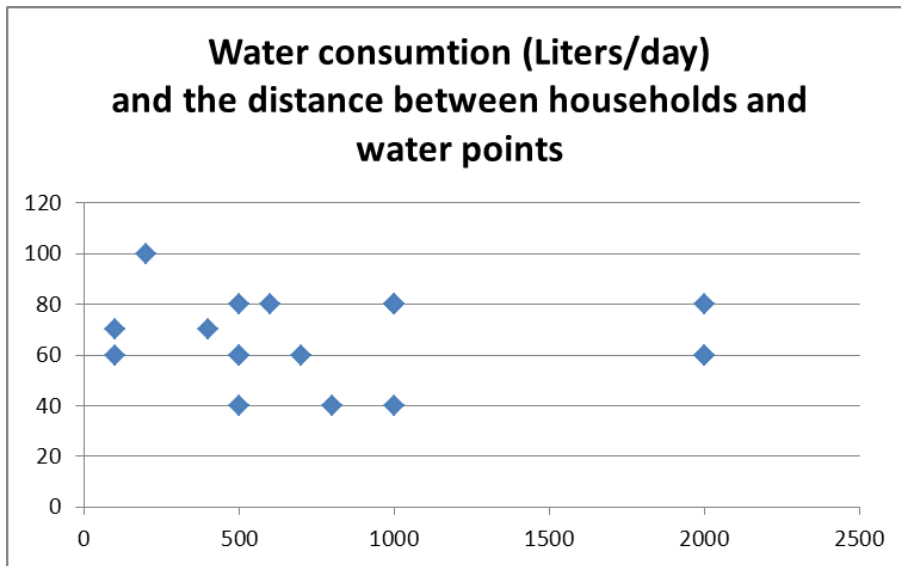
**Table 4**  
**Water consumption**  
**At the different levels of household size, income and occupation**

	<b>HH size</b>	<b>Occupation</b>	<b>Income (Rwanda Francs)</b>	<b>Qty con- sumed (Li- ters)</b>	<b>Dist. to water point (meters)</b>
	4	Peasant	5000	80	1000
	4	Peasant	8500	40	800
	3	Peasant	10000	40	1000
	4	Peasant	10000	60	2000
	5	Peasant	10000	70	100
	8	Peasant	12500	80	600
	3	shop keeping	15000	60	500
	5	Peasant	15000	70	400
	2	Peasant	20000	60	700
	4	Peasant	20000	100	200
	5	Bicycle re- pairer	20000	80	2000
	7	Peasant	20000	60	100
	5	Peasant	30000	80	500
	7	Sells a bar	30000	80	1000
	3	Peasant	35000	40	500
	4	Carpenter	40000	80	1000
	5	Beekeeper	45000	60	2000
	5	Taxi operator	60000	60	500
<b>Average</b>	<b>5</b>		<b>22,555</b>	<b>67</b>	<b>828</b>

(Source: **The field study.**)

The average household size of 5 got here closely corresponds to the 4.8 average for the Musanze district (EICV3). The measures of average household incomes, water consumption and distance to the nearest source are more divergent from those of EICV3. Let us note that four households in our study that spend 48%, 12%, 12% and 11% of their incomes respectively on water, are located farther than 500 meters away from the nearest water sources. The household that spends 48% of its income on water is a full kilometre away from the water point. Similarly, some other households that spend more than 10% of their household income on water are located far (say, 800 meters or 1 kilometre or more) from their nearest water point. This is rather counter-intuitive, as the distance from the water point can be assumed to be a disincentive for households to spend money on water. At any rate, it is not only the financial constraint but also the distance from the water sources that deprives these households of fairness.

Figure 7



Moreover, all of them are peasants, which essentially explain their low incomes as compared to others like the taxi-operator, beekeeper and carpenter among others. It seems that this correlates more with the 69% population proportion living in multiple deprivations as indicated by the *Human Development Report 2013*.

Against the SNV reports that the arrangement has been to ensure all prices are standardized (SNV 2013: 11), we have seen earlier and all through the data that that is not the case yet. The water facilities in the urban centres has still been operated EWSA charge different fees (twice) those charged by the rural WASH sources. Furthermore, this is further divided into two, where the home stand-pipes are billed directly by EWSA while the public/common place water kiosks are established through the official tender process for private individuals to operate and collect the bills from users. At the EWSA operated water points the cost for a gallon of 20 litres is 20 Rwanda Francs. From the WASH water points in rural areas the cost is 10 Rwanda Francs. The WASH water points are also contracted out to private operators. Water price disparities have thus not ceased to exist even if the government, SNV and UNICEF partnership wanted otherwise.

The continued price disparities are due to largely the inability of the government to conduct regular supervision and regulation of the water pricing. Community residents attest that they have not seen any government official come to supervise water points or consult with them about the issues related to water service delivery. The communities by virtue of the arrangements set under WASH, are supposedly invited to consultative meetings with their water user committees and the private contractors to determine the water tariffs (SNV 2013: 10; Republic of Rwanda 2010: 12). The reality, however, is that the private contractors are given the discretion to set their own rates and the users do not have any influence on them. Their complaints have hardly received any response from the government.

The officially approved rates for water set by EWSA are surpassed by between two to four times by the private operators. The table below shows the comparison of these rates.

Table 5

Comparing EWSA approved rates versus  
Rates charge contracted by private operators (Rfw)

Quantity of water (m <sup>3</sup> )	Number of 20 litre gallons	EWSA approved rates	WASH private contractor's rates	EWSA private contractors rates
At Public Water Kiosk		240	500 – 2,500	1,000 – 5,000
1 – 5	50 – 250	240	500 – 2,500	1,000 – 5,000
6 – 20	300 – 1,000	300	3,000 – 10,000	6,000 – 20,000
21 – 50	1,050 – 2,500	400	10,500 – 25,000	21,000 – 50,000
51 – 100	2,550 – 5,000	650	25,500 – 50,000	51,000 – 100,000
101 and above	5,050 and above	740	50,500 + to volume	101, 000+
Industrial	Not specified	590	N/A	N/A
Water taps (BF)	Not specified	240	N/A	N/A

Sources: i) Official water rates: EWSA website at <http://www.ewsa.rw/TariffsCharges.html> (verified from EWSA office during the field survey), ii) Private operators' charges: on-site visits to the sources.

It looks completely out of normality, but this is the reality of what is on the ground. According to EWSA approved rates, 1 m<sup>3</sup> (50 gallons) of water cost 240 Rwanda Francs, meaning 4.8 Rwanda Francs per gallon. As mentioned earlier, the WASH private operators charge at the rate of 10 Rwanda Francs per gallon while the EWSA private operators in public access kiosks charge 20 Rwanda Francs. These distortions due to private operators have amounted to more than 100% and 200% mark-up, respectively.

The executives of the Musanze district in my study confirm that the private contractors are left with discretion to set the price for water. This contradicts the agreement between the committees of water users and the private contractors under the auspices of the local government authorities as SNV (2013: 10-11). Many private contractors/operators in my interview stated that the additional margin is not only for their profit but also for the caution money/advance to the government paid when obtaining the contract. Kiosk operators pay a fee of 30,000 Rwanda Francs while those applying for the installation of home (personal) stand-pipes have to pay 5,000 Rwanda Francs. They amount to an evident compromise between community's welfare calculation by the government and the market profit motives of the private operators. The responsible government officials for overseeing the operation of these water points are not fully aware of the troubles the communities are facing under this system. Similarly, the development partners (SNV and UNICEF) are any better in terms of awareness.

Why do the EWSA contracted sources charge more than the WASH sources? To this question, the EWSA official in my interview interestingly expressed his ignorance of these price differences. My question was whether the consolidation of the tariff structures has allowed all Rwandans to pay the same price. The official affirmed that the prices are now standardized and everybody pays according to their consumption. On the differ-

ence between the EWSA-operated sources and the WASH sources, the official insisted he did not know about the different prices and would need to visit to verify them. This confirms the issues that community members identified, i.e., the lack of adequate supervision. As stated before, many community members expressed that they rarely sighted government officials at their water points. Others stated that their complaints to the government had not met any response. This reverberates with our opening assertions at the outset of this paper, that the most serious weaknesses in government operated water utilities is the lack of adequate government management (Loong and Danqing 2006; Jooste 2008; Obayagbona 2008; Bandung 2009).

The above-mentioned price differences have caused much discomfort to community residents, some of whom expressly stated that the services were poor, and the prices were unstable and unfair. At least 28% of the respondents of my study blamed the government for not responding to their concerns, and stated it as a matter of urgency. Furthermore, the water tariff does not remain unchanged between the day time and night: the water tariff is often raised after 6 pm and further more at the later hours, say, up to 20 Rwanda Francs for the WASH water points or 40 Rwanda Francs for the EWSA water points. Needless to say, this apparently has huge implications for the community residents' general welfare.

All of our interviewees expressed price instability of water in accessing water at the EWSA managed points, more so than the WASH water points. The greater concern in the WASH points is about mechanical failures, typically breaking down of water pipes and lesser availability of water during the dry seasons. In fact, users of WASH-provided- water say many issues have been improved. This does not seem to apply to the EWSA points where, as mentioned earlier, the government's overall supervision has been far from adequate.

### **Community control, empowerment and the right to water**

Despite of its express aims and mode of operation propagated by the WASH project, it is difficult to recognize much participation of the community members in the water management. All of the respondents of my study stated that the water prices are usually set without them being consulted with or informed of such in advance. A number of respondents had views similar to these:

'We are just informed of the prices.'

'I just see things happening.'

'We are not consulted, but we have no option. This is the only option.'

(Responses from the field interviews)

The public-private partnership of the WASH project for water delivery was based on strong community participation in determining the water tariffs, but the reality has not lived up to this assumption. Many feel that community residents are side-lined, if not disempowered. The lack of public knowledge about the decision-making process (not to mention their participation) in the water delivery has raised the danger of subjecting community residents to greater exploitation. In reality, as pointed earlier, it

is the lack of such knowledge that has allowed This also allows water tariffs to fluctuate.

In our interview, community members were asked if they thought their access to water as a right. The responses got were only 11% affirmative. The rest of the respondents (89%) stated that either they had no idea, or they had never know nor heard about water as a right. This reflected low levels of capacity of the community members to push their wish against the water point operators. They do not think water as their basic entitlement. This links with how the community members expressed their wishes, that the water should be provided to them for free, but for now they have no alternative.

The other factor that may be enabling the situation to prevail may be that the local governments and partners take the award of contracts and signing of the contracts as final determinants in the process. As such, the community is not able to intercept the determination of the water prices. In this case the New Public Management principle of stakeholder participation gets limited and does not fully play its role. This still draws us to the arguments of Awortwi (2004) of getting the fundamentals wrong – presuming that the conditions are all okay and the principles will work out by themselves. The contracted private operators take the figures quoted in the calls for bids and their expenses during the tender seeking process as prime rather than the community's perspective.

The committees at various levels (cell, sector and district) also make another barrier where communities are thought to be represented. In reality again, there are hardly consultations by those representatives in the committees with the rest of the broader community members. If the community were the principal in this case and giving their representatives as the agents the power to represent them, then there is a failure to specify what should be communicated by the agent, hence how much the agent actually represents the viewpoint of the principal. The different structures thus serve their own purposes at different levels, which is not necessarily bad in terms of autonomy as in the New Public Management theory, but also play the role of obstructing direct community participation in determination of the water tariffs, obstructing accountability to the final principal of all the structures including the government.

The disparities between reality and what is reflected in the reports and official documents reflects the challenges to ensuring access to water for everyone. Distance as we saw is not yet fully reduced as presumed by government and development partners. The price differences particularly between EWSA and WASH sources is also far apart by two times. The proportion of income of the households spent on water expenses is high and affects consumption. This may have its own implications for poverty and wellbeing. Government regulation of the private operators and overall supervision is weak and contributes to the price fluctuations especially those charged in the evening hours. Community participation is equally hard to realize under the PPP as most times presumed. The determination of the prices is put off from the direct involvement of the communities and goes into the contracting processes.



## Chapter 5 Synthesis and conclusion

On the broader perspective of the effectiveness of PPP, evidence still leaves us with doubts in water service delivery as has been found in several countries globally. The tendencies to over-charge communities for water is still prevalent. There I perhaps need for more studies focussing on why private companies have that as a predominant tendency. Allinnettes (2004) reported of the trend in Metro Manila, Loong and Danqing (2006) found the same situation in China to the extent that water consumption by the whole community dropped. This may potentially compromise health and wellbeing. Obayagbona (2008) on the case of Nigeria found that non-state actors charged price that sometime went up to 8 times the officially approved rates. Jooste (2008) on the protests in Bolivia reports a similar story that the the community finally come out and demand the government take over water service delivery.

The current presumption is to take it as the effect of market logic and profit maximizing (Jooste 2008). But the account of all factors may not be complete only by that assertion. There could be several issues around water that are necessarily not accounted for. Its natural monopoly tendency and quiet hard replacement/alternative may be a serious reason here. But in terms of actual costs of servicing the operations, there may be need for more studies to ascertain actual cost-related issues of water resource management that can be confirmed as not needing the market logic of cost-recovery because the cost itself may be too high.

The private contractors in Rwanda's case do not experience these costs per se, but the charges that they impose in the evening hours becomes exorbitant. In this particular case, there may be issue of failure of the principal-agent theory in enabling communities hold their governments accountable. If governments are formed out of the people but the people entrust the agents chosen there to guard community interests, in this case, it has not worked. This also turns to how much the government as the principal can be effective in monitoring the agents it contracts out services to. We may be blind to issues around actual power distribution, interest and effort the principal as the government in this case is, put in pursuing the interest of another principal – the community. This is essential to be reviewed in processes such as the undertaking of bidding processes till contracting and how community interests are factored in or actually become marginalized from decision making and control.

PPP has hardly come to terms with the community empowerment always postulated at the institution of the partnership frameworks. Communities are partners and participants in project and programme operations or monitor the local development undertakings. Experience reflects that the perception thereafter turns to look at PPP as strengthening the private sector operation of previously public facilities/utilities. This is what has been continuously advocated for by the big international multi-lateral development financing agencies especially World Bank, for an ever increased role of the market and private sector

(Lazarte 2011). It is feared that communities become increasingly disempowered and left to their own fate in the market

The creation of structures of the principal-agent themselves essentially become the beginning rifts between satisfaction of the actual interests of the principal if there is not adequate means (resources, time and information for example) in their hands to keep the agent in check. In terms of demanding the non-profit CSO development interventions may equally need to be weighed against similar possibilities and potential. For example if they will not make the government lift its hands further off from service delivery and leaves its roles neglected; or how much and how long the CSO will remain accountable and capable of effective and efficient delivery. Still again, how much resources the CSO actually has to keep the processes of ensuring accountability to the principal is followed throughout without failing along the way.

The issue of poverty seems to be discussed at a certain point in the start of the efforts to provide services. The more the services get into the market system, the poverty question increasingly dwindles both from government focus but more so from the private contractors given the service delivery. The understanding of water as a merit good on the other hand seems to so imply fail to exist in the private provider's framework. The market logic in this sense hardly respond to poverty situations. Although the difference that exists between the WASH and EWSA water point in terms of pricing makes another view of government negligence in understanding the depth of poverty and how to respond to it. The charges on water are then grossly approximated. It may not necessarily be the private actors in this case that have the problem, but government's own weaknesses in analysing community problems in depth.

Water in its provision needs to be provided with several variables taken to account. The income levels need to be differentiated all through the user profiles. The amount of water consumption on the other side cannot be homogenized especially with the known different uses that exist across households depending on its livelihood means. The volumes need to equally vary by climate and prevailing weather. These all need to be factored in the computation of water tariffs. The same needs to apply to the computation of distance as a proxy for access to safe-drinking water. It needs to change to consider the financial cost that influences choices of use, the time cost that is incurred in lining for example and this is most important in densely populated areas where locating one source may not necessarily be solving the problem in light of all the numbers of people that it has to serve. It is not a surprise then that such complexity brings in the first place the calls for governments to manage water service delivery without and keep it free of market interests. But it equally makes it necessary for the government to take the costs involved in installation and extension of water services. The costs needed in such processes will make the private operators for purposes of profit and cost recovery make water simply unaffordable to the communities.

It becomes a potentially fertile field to revise the utility theory in which case, we do not simply look at only exercise of options so that communities are found to be utilizing safe water source less and go to unsafe sources as the case in Musanze indicates, but rather treat it as a real problem of exclusion and deprivation. It reflects what UNDP rec-

orded of 69% Rwanda's living in condition of multiple deprivations. In this case, the measurement of poverty as well as its conceptualization needs to be revisited more in the development practice mainstream of international donor agencies that are supporting PPP and more so on services such as water. Whereas the UN with its HDI contemplates multidimensional nature of poverty, governments and development agencies seem little attention to the issues of human deprivation on the ground. The situation is likely to worsen the trend of marginalization and exploitation of the poor.

## **Conclusion**

The study has been able to bring to light some challenges communities face in accessing safe drinking water in the modern mechanisms of delivery. Even in its limitation of numbers, it reflects a situation that may be occurring without policy attention. The documentation of project reports by government and international development agencies most times ignore the different experiences on the ground and it is presumed that the averages and overall figures serve as the experience of the whole population. The complexity of defining poverty and so its measurement gets intertwined into these processes and conceals the capacity of actors to truly respond to community situations.

The high drive to market-based models of delivery especially in developing countries has a lot to be uncovered, but has also to be undertaken with due caution. There may be sectors that certainly work better with the market systems, but there are those like water that may not be the best application avenues. It does not discredit the whole notion of market-based models but also indicate that the public provisioning has its own strengths which need not be overlooked. The experience of Rwanda can be a lesson to be shared by other developing countries adopting similar mechanism for water service delivery.

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