



Water Pricing

Michael Kropac & Martina Ricato, seecon international gmbh

Adapted by Mostafa BIAD

Copyright & Disclaimer

Copy it, adapt it, use it - but acknowledge the source!

Copyright

Included in the SSWM Toolbox are materials from various organisations and sources. **Those materials are open source.** Following the open-source concept for capacity building and non-profit use, copying and adapting is allowed provided proper acknowledgement of the source is made (see below). The publication of these materials in the SSWM Toolbox does not alter any existing copyrights. Material published in the SSWM Toolbox for the first time follows the same open-source concept, with all rights remaining with the original authors or producing organisations.

To view an official copy of the the Creative Commons Attribution Works 3.0 Unported License we build upon, visit <http://creativecommons.org/licenses/by/3.0>. This agreement officially states that:

You are free to:

- *Share* - to copy, distribute and transmit this document
- *Remix* - to adapt this document. We would appreciate receiving a copy of any changes that you have made to improve this document.

Under the following conditions:

- *Attribution*: You must always give the original authors or publishing agencies credit for the document or picture you are using.

Disclaimer

The contents of the SSWM Toolbox reflect the opinions of the respective authors and not necessarily the official opinion of the funding or supporting partner organisations.

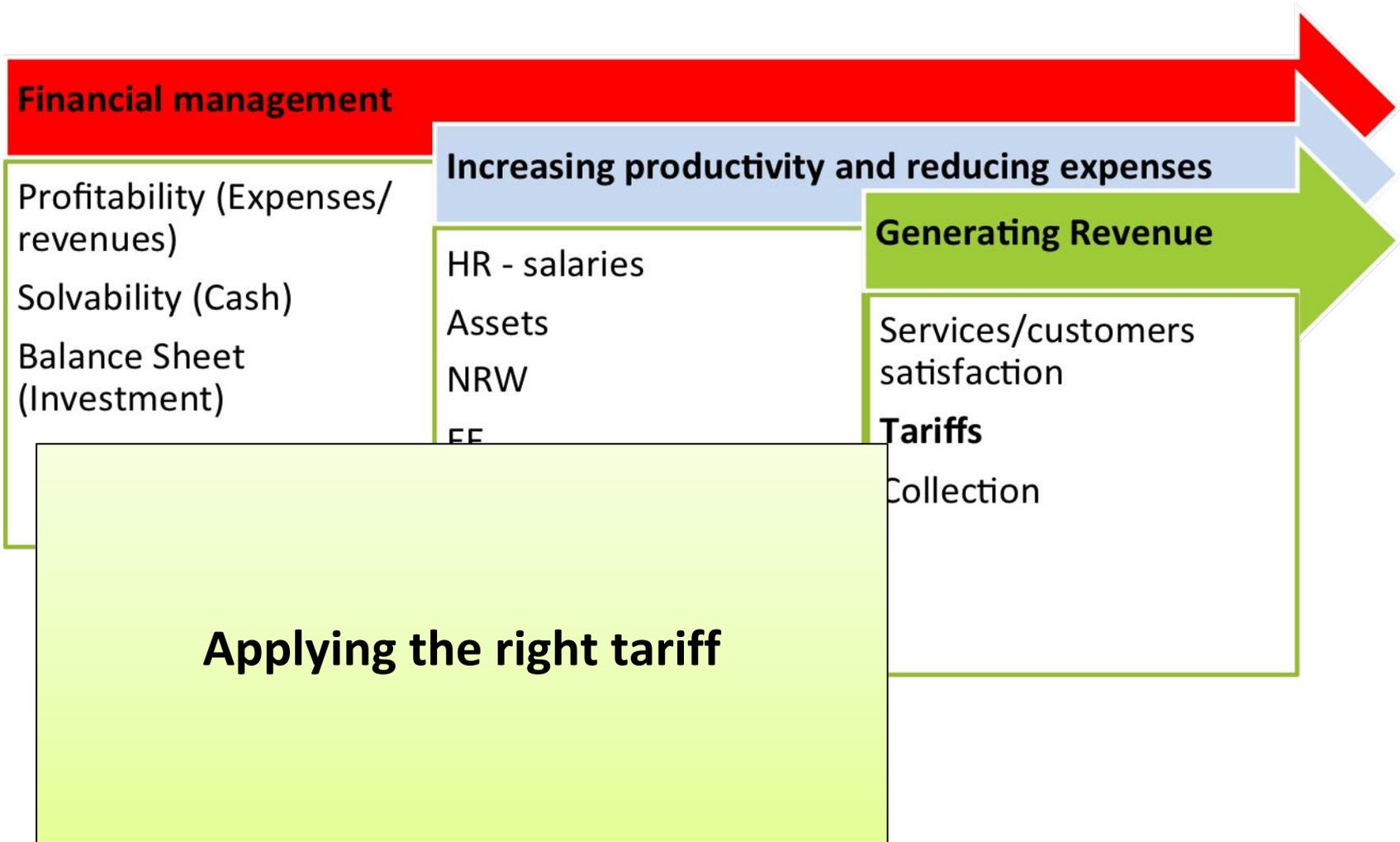
Depending on the initial situations and respective local circumstances, there is no guarantee that single measures described in the toolbox will make the local water and sanitation system more sustainable. The main aim of the SSWM Toolbox is to be a reference tool to provide ideas for improving the local water and sanitation situation in a sustainable manner. Results depend largely on the respective situation and the implementation and combination of the measures described. An in-depth analysis of respective advantages and disadvantages and the suitability of the measure is necessary in every single case. We do not assume any responsibility for and make no warranty with respect to the results that may be obtained from the use of the information provided.



Contents

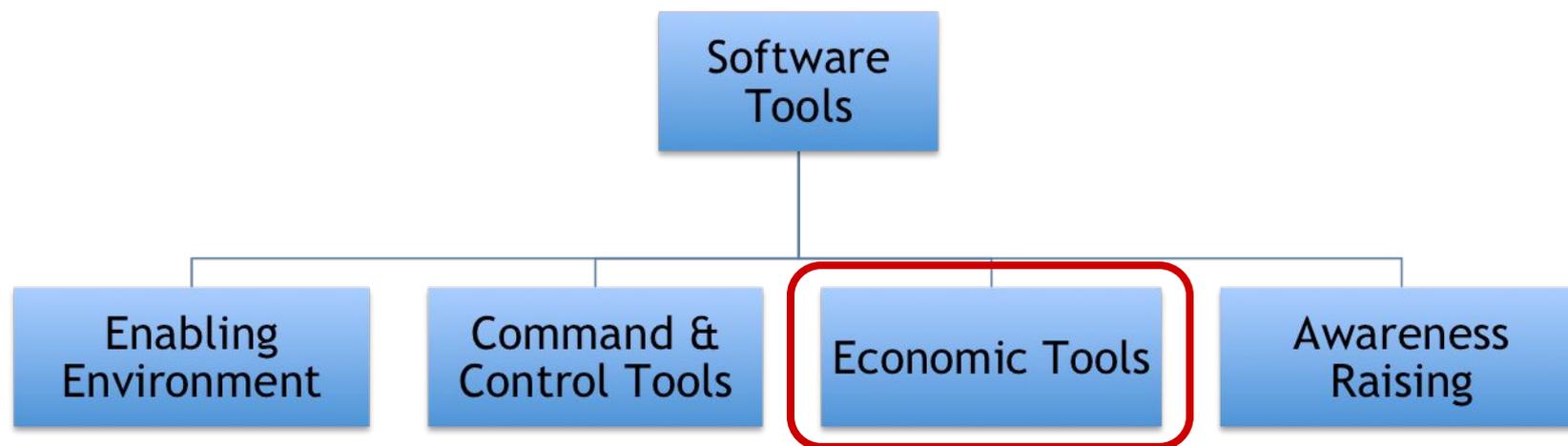
1. Reminder on main issues for Financial sustainability for water Utilities
2. Introduction
3. How can Water Pricing contribute to SSWM?
4. Social Implication of Water Pricing
5. Who Defines the Price of Water?
6. Types of Water Tariffs
7. Applicability
8. Advantages/Disadvantages
9. Financial Sustainability : what else ?
10. References

Financial Sustainability of water Utilities



1. Introduction

Where does Water Pricing belong to?



→ Pricing Water is an **economic tools** that belong to the software implementation tools in Sustainable Sanitation and Water Management

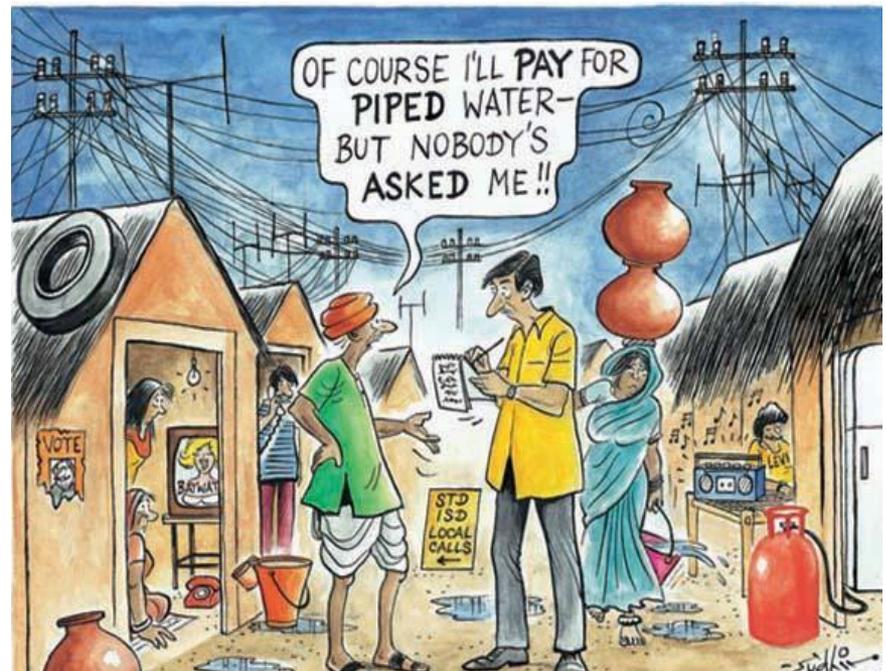
1. Introduction

With Economic Tools...

...people change their behaviour because they want to achieve maximal benefit at minimal cost. Economic Tools involve the use of prices and other market-based instruments to provide incentives monetary incentives to change behaviour.

Tools:

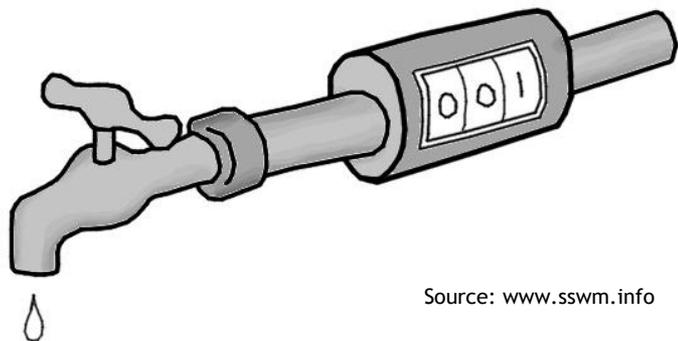
- Water pricing (tariffs)
- Subsidies
- Charges (irrigation, wastewater)
- Tradable water rights
- Etc.



Source: <http://www.wsp.org/userfiles/image/november2002.jpg> [Accessed: 23.03.2010]

1. Introduction

Water Pricing in general



Source: www.sswm.info

- In July 2010, the UN general assembly proclaimed access to safe drinking water and sanitation as a **human right**. At the same time, water and sanitation are also **economic goods**.
- A **water tariff** is the price assigned to water supplied by a public utility generally for both freshwater supply and wastewater collection & treatment.

*Here we will introduce **water tariffs** as an important economic instrument for improving water use **efficiency**, enhancing **social equity** and securing **financial sustainability** of water utilities and operators.*

1. Introduction

Water Tariffs

Water and wastewater tariffs **determine the level of revenues** that service providers **receive from users** in centralised or semi-centralised systems for the appropriate treatment, purification and distribution of freshwater, and the subsequent collection, treatment and discharge of wastewater.

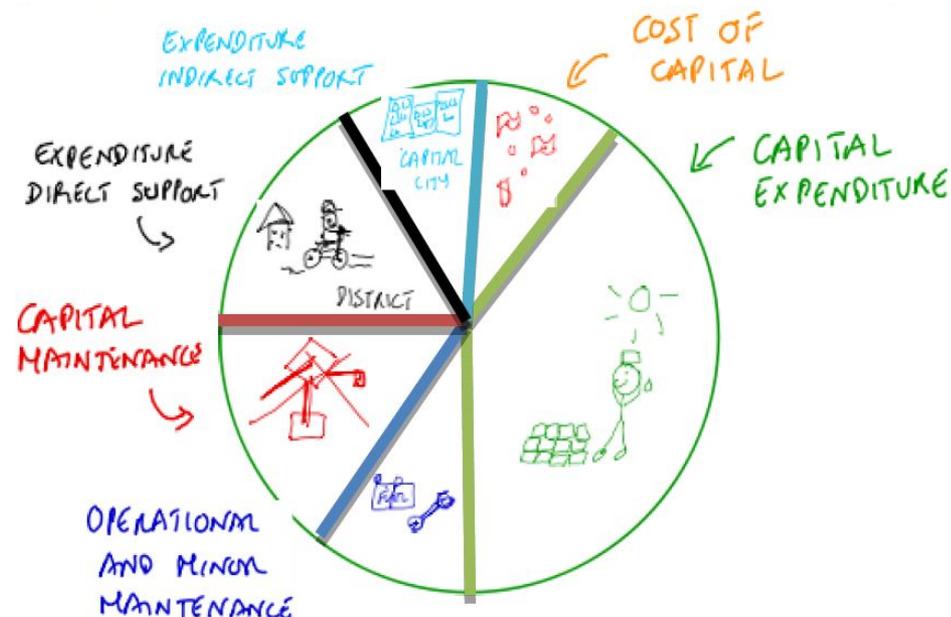
There is **wide variation of tariff setting** practices around the world, and there is no consensus on which **tariff structure** best balances the objectives of the utility, consumers, and society

1. Introduction

Why Water Tariffs?

Providing water and sanitation services is costly.

In many countries consumers pay to little for water services. Revenue from water charges does not even cover operation and maintenance of water utilities, let alone re-investment for the infrastructure.



Poll question 1 : Tariff vs Cost recovery

Are tariff revenues covering : **last Webinar**

- 1) Full Cost (Capex + Opex) : **21%**
- 2) Only O&M Cost (Opex) : **38%**
- 3) Not even the Opex : **41%**
- 4) I don't know : **0%**

2. How can Water Tariffs contribute to SSWM?

Why Water Tariffs?

A tariff is an important management tool that can be used to assist with efforts to improve the delivery of water and sanitation services



Having to pay for water encourages water-saving behavior, thus promoting water conservation

Source: <http://www.ec.gc.ca/education/default.asp?lang=En&n=5da49e15-1>
Accessed 20.06.10

2. How can Water Tariffs contribute to SSWM?

How high should the price for water be?

**For
Consumers**

It should be as
cheap as
possible

For Utilities

It should **cover**
all running and
reinvestment
costs

**For the
Environment**

It should be as
expensive as
possible (so it
is not wasted)

→ *Defining an **appropriate price** for water can help to make Sanitation and Water Management socially, economically, and environmentally sustainable.*

3. (Social) Implications of Water Pricing

Water is a human right, but also an economic good.

Water pricing decisions affect several different objectives or goals of policy makers, often in conflicting ways.

Objective of the water sector:

- Cost recovery
- Economic efficiency
- Equity
- Affordability



Source: http://education.melbournewater.com.au/content/water_supply/saving_water_at_home_and_school/every_drop_counts/primary/the_weak_link.asp
Accessed 20.06.2010

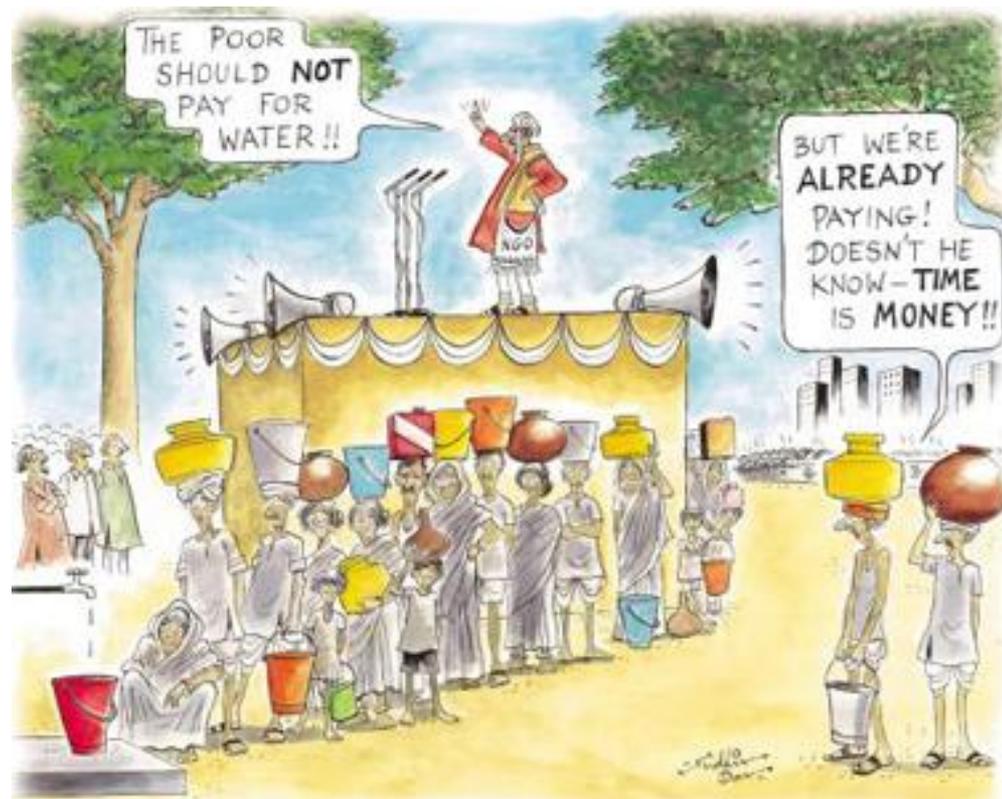
3. (Social) Implications of Water Pricing

Concerns:

Water tariff design is a political process that is rife with controversy

Rather than providing affordable water to the poor, pricing strategies may lead to

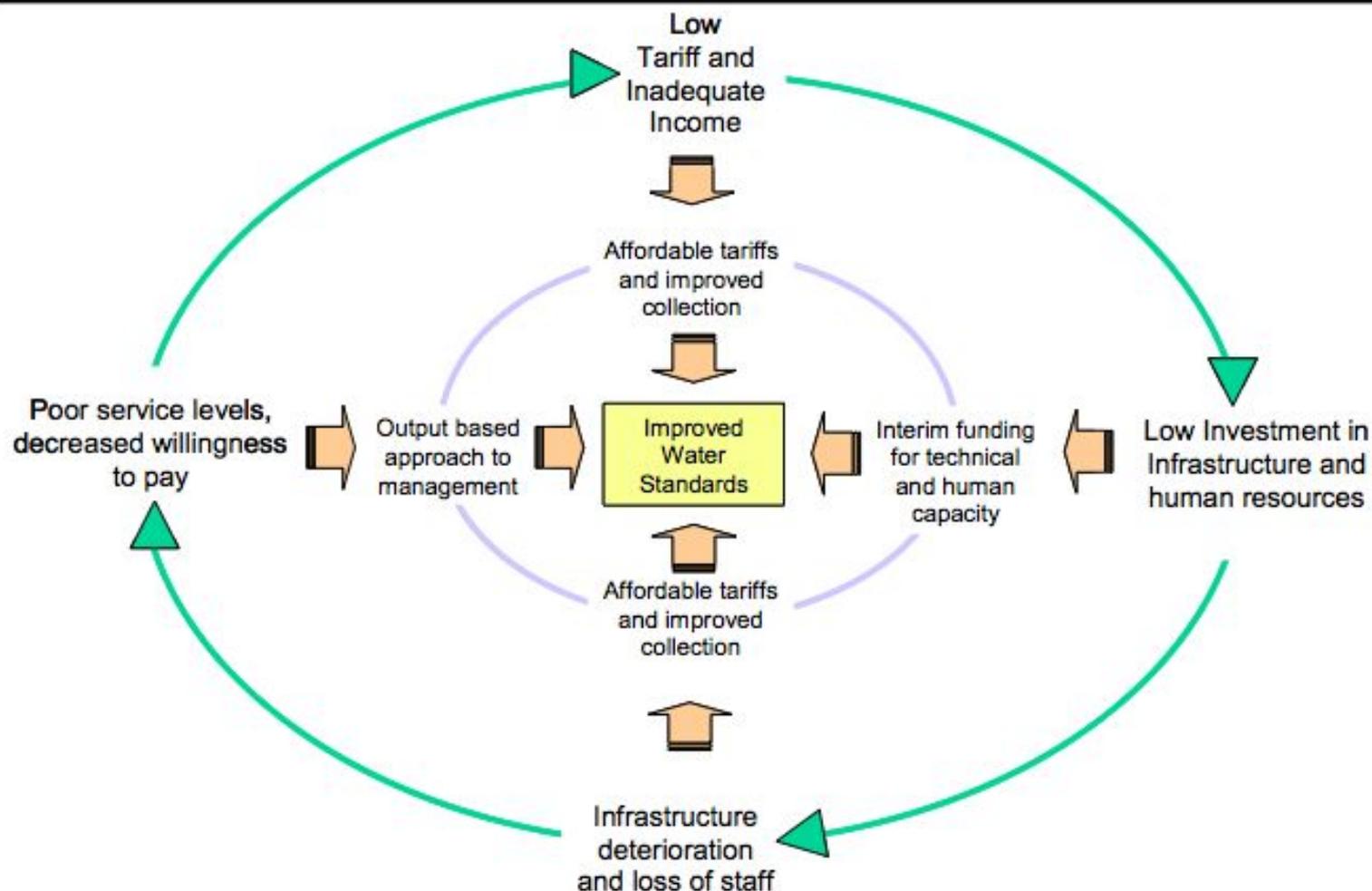
- Revenues do not cover operational and maintenance costs of utilities
- Hence, access to the services cannot be guaranteed for all
- Inequity



Source: http://www.wsp.org/index.cfm?page=page_disp&pid=10820
(Accessed 10.06.2010)

3. (Social) Implications of Water Pricing

The vicious cycle of low water prices



3. Social Implications of Water Pricing

Water tariffs can be designed addressing the need of the poor

Social protection measures:

- Affordability measures:
 - Income support measures
 - Tariff-related measures
 - Subsidies



Source: <http://www.blacd.org/Gallery.aspx?PageID=27&Lang=en-US>
Accessed 20.06.2010

4. *Who Defines the Price of Water?*

Main Stakeholders involved

At the national level, the following entities usually have a say in defining the environment in which water and sanitation management take place:

- Government
- Regulatory Agencies
- Water utilities
- Municipalities
- Companies
- NGO's
- Water consumers

5. *Types of Water Tariffs*

Types of tariff structures commonly adopted by utilities

1. **No Charge**
 - Free Water

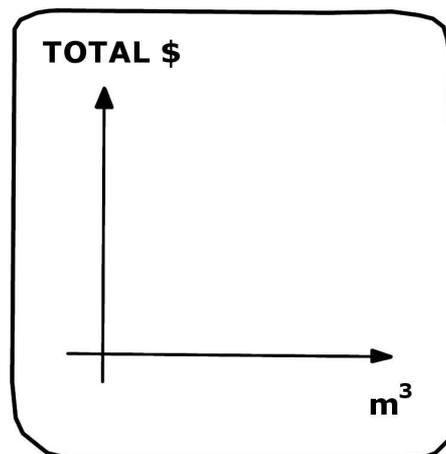
2. **Single Part tariff**
 - Fixed Charge

 - Volumetric Charges
 - *Uniform Volumetric Tariff*
 - *Increasing Block Tariff*

3. **Two parts tariff**
 - Usually a combination of a fixed charge and a volumetric charge

5. Types of Water Tariffs

No Tariff: Free Water



- Water is free for consumers
- No metering system nor a administration to collect charges are needed
- Occurring costs are covered by the general budget of the government

In: Common in certain States of India (e.g. West Bengal)

Advantages

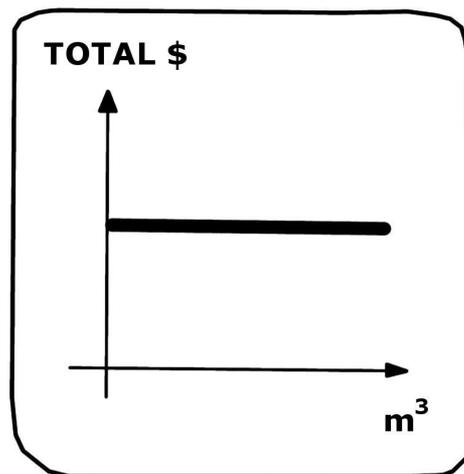
- no meter nor administration to collect charges are needed
- very simple (for consumers)
- consumers love it

Disadvantages

- no incentive to conserve water; water is wasted
- no awareness on value of water
- Cost recovery impossible; risk of deteriorating services very high

5. Types of Water Tariffs

Fixed charge



Source: www.sswm.info

- Monthly water bill is independent of the volume consumed
- Only way to charge consumers in absence of a metering system

In: Places without meters; large parts of India, Lebanon

Advantages

- No metering system needed
- Easy to administer
- Provides stable and foreseeable cash flow if set at appropriate level
- Advantageous for bulk consumers

Disadvantages

- no incentive to conserve water; water is wasted
- no awareness on value of water
- Water might be sold at higher prices by street vendors to the households with no access
- Cost recovery difficult

5. Types of Water Tariffs

Example: Fixed Water Charge in Raipur (India)

Tariff structure in Raipur in 2009.

Type of Consumer	Size of Connection	Per Day Charge	Yearly Fee
Domestic	0.5" = 1.3 cm	Rs 2.00	Rs 730 = 15.86 USD
Commercial	0.5" = 1.3 cm	Rs 4.90	Rs 1'788.5 = 38.88 USD
	0.75" = 1.9 cm	Rs 15.00	Rs 5'475 = 119 USD
	1" = 2.5 cm	Rs 25.00	Rs 9'125 = 198.36 USD
	1.5" = 3.8 cm	Rs 40.00	Rs 14'600 = 317.39 USD
	1.75" = 4.4 cm	Rs 70.00	Rs 25'550 = 554.34 USD
	2" = 5.1 cm	Rs 100.00	Rs 36'500 = 793.47 USD
	2.5" = 6.4 cm	Rs 130.00	Rs 47'450 = 1'031.52 USD

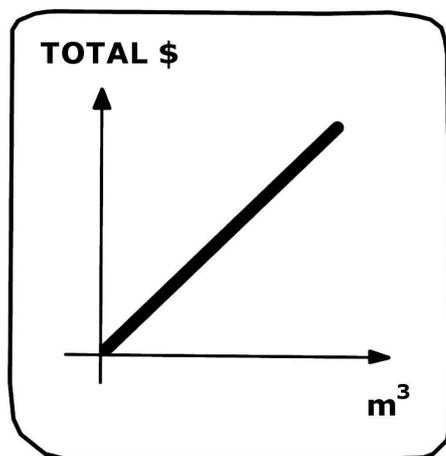
Source: TERI 2010

5. Types of Water Tariffs

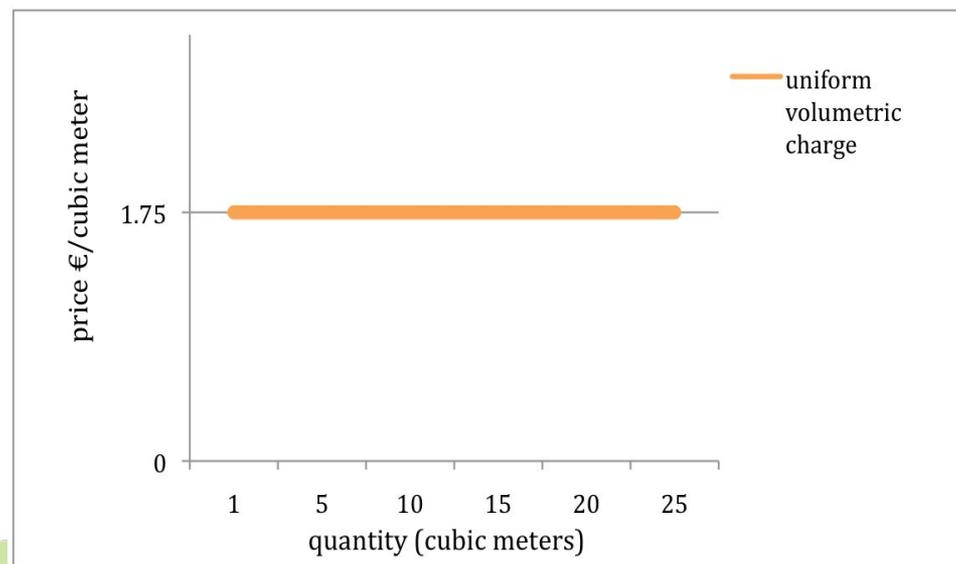
Uniform (linear) volumetric tariff:

- All units (cubic meters) are priced the same rate, independently of total consumption ($\$/\text{m}^3$ is uniform)
- metering system needed
- Often combined with a basic fixed charge

In: Throughout the world; most common water charge in OECD countries



The graph shows how the price per unit of water remains constant independently of the use



5. Types of Water Tariffs

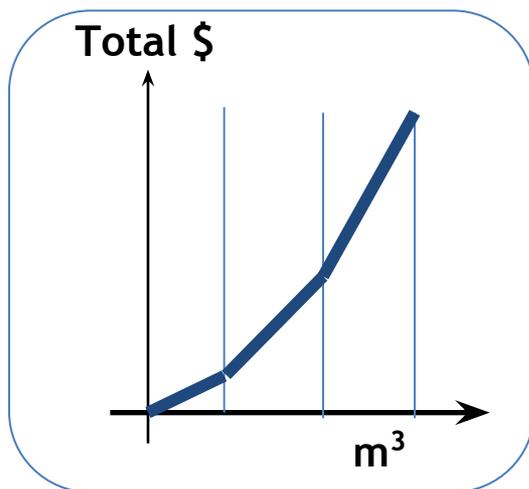
Uniform (linear) volumetric tariff:

- Simple; relatively easy to administer
- Provides stable cash flow if set at appropriate level
- Pay what you use; ensures social equity
- People can limit their bills by reducing consumption → Incentive for water conservation

- Metering system needed
- High initial cost for installing meter system
- Rich and poor pay the same price for water indifferent of ability to pay

5. Types of Water Tariffs

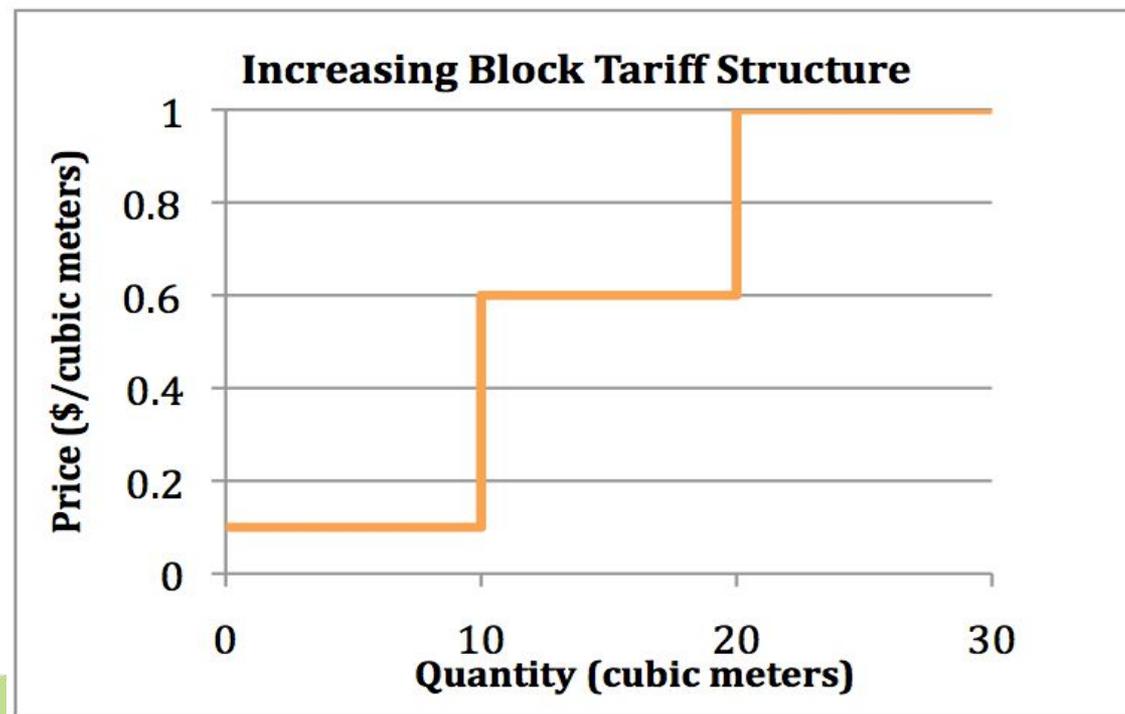
Increasing Block Tariff:



The graph shows an example of how the price of water to the consumer changes as the quantity of water used increases for increasing block tariff.

- The rate per unit of water increases as the volume of consumption increases.
- metering system needed

In: Water scarce areas such as Spain or Middle East, many developing countries



5. Types of Water Tariffs

Increasing Block Tariff:

Increasing block tariff adopted in 1997 from the municipality of la Paz together with the local water utility (SAMAPA) and the Bolivian national tariff board.

Volumetric Charge (US \$ per m ³)	Domestic Water Connections	Commercial Water Connections	Industrial Water Connections
0.22	1 to 30 m ³		
0.44	31 to 150 m ³		
0.66	151 to 300 m ³	1 to 20 m ³	
1.18	Above 300 m ³	Above 20 m ³	All water

*Notes: 99% all residential consumers use less than 150m³ per month.
 The long run marginal cost is estimated at US \$ 1.18 per month.*

5. Types of Water Tariffs

Increasing Block Tariff:

- Ensures cost recovery by well designed size and height of the blocks
- Poor households connected to the network are provided with affordable water
- Promotes water conservation

- Tariff design is complex
- Difficult to implement, especially if there is no metering system in place
- Consumers do not pay according to the costs their water use imposes on the utility
- Penalises poor families with large households and/or shared connections

Poll question 2 : Witch Tariff structure

Witch Type of tariff structure is adopted by your utility ?

1) No Charge : Free Water	:	: 0%
2) Fixed Charge	:	: 6%
3) Uniform Volumetric Tariff	:	: 12%
4) Increasing Block Tariff	:	: 47%
5)A combination of 2) and 3)	:	: 35%

Summary of performance of alternative tariff structures against design objectives

Tariff	Objectives			
	Cost recovery	Economic Efficiency	Equity	Affordability
Fixed Charge	(+) Provides stable cash flow if set at appropriate level, but utility may be vulnerable to resale of water and spiralling consumption	(-) Does not send a message about the cost of use of additional water	(-) People who use large quantities of water pay the same as those who use little	(+) If differentiated by ability to pay, but households are unable to reduce their bills by economizing on water use
Uniform Volumetric Charge	(++) If set an appropriate level, moreover revenues adjust automatically to changing consumption	(++) If set at or near marginal cost of water	(++) People pay according to how much they actually use	(++) Can be differentiated by ability to pay, and people can limit their bills by reducing consumption
Increasing Block Tariff	(++) But only if the size and height of the blocks are well designed	(-) Typically little water is actually sold at marginal cost	(-) People do not pay according to the costs their eater use imposes on the utility	(-) penalizes poor families with large households and/or shared connections

(++) Good, (+) Adequate, (-) Poor

Source: WHITTINGTON et al. 2002

Poll question 3 : Collection ratio

Do you have an idea about the Collection ratio of your utility?

Collection ratio (%) = Total amount effectively collected / total amount billed

1)	80 to 100 %	:	: 3%
2)	50 to 80 %	:	: 47%
3)	20 to 50 %	:	: 35%
4)	Less than 20 %	:	: 0
5)	I Don't know	:	: 15%

6. *Applicability*

- Water and wastewater tariffs are applicable for centralized or semi-centralized water and wastewater systems
- Water tariffs can be applied at different levels: national, district and local level
- The policy and regulative framework for water tariffs is different in every country
- Tariffs can be designed within a policy framework that addresses the needs of the poorest
- Policy makers need to decide which objective are the highest priority and, where possible, use more instruments

Adapted from WHITTINGTON et al. 2002

7. Advantages & Disadvantages of Water Tariffs in General

Advantages:

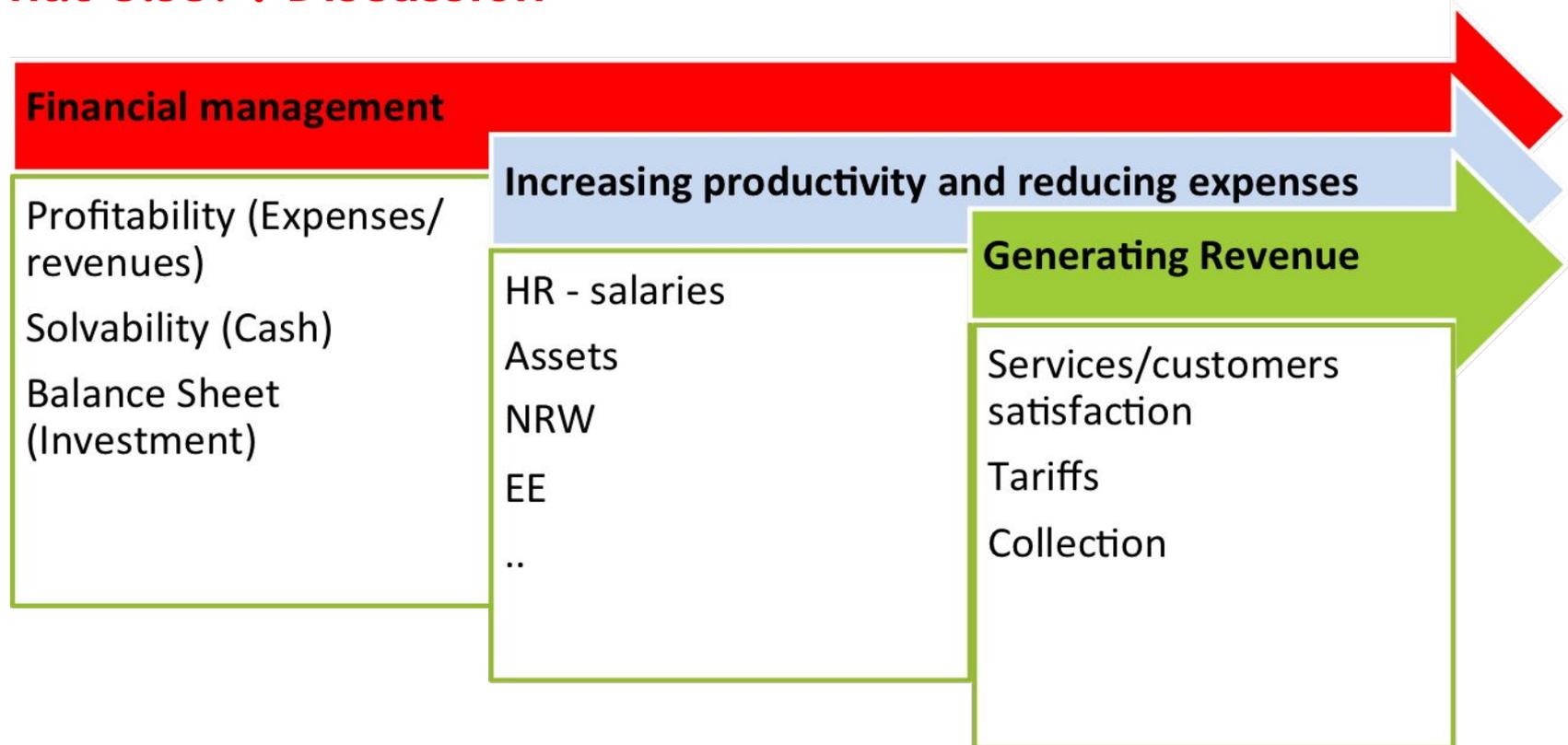
- Provide incentives for efficient water use and for water quality protection
- Provide funds for necessary infrastructure development and expansion
- ensure at the medium-long term that water services can be provided to all citizens at an affordable price

Disadvantages:

- there is disagreement over the objectives of water pricing and tariff design
- Tariff setting is a complex process that need high volume of data
- Tariff setting process is often not transparent
- Water tariffs are often difficult to understand for consumer

Financial Sustainability of water Utilities

What else? : Discussion



8. References

WHITTINGTON D. et al. (2002): Tariffs and Subsidies in South Asia: Understanding the Basics. Washington, D.C.: Water and Sanitation Program; World Bank Institute; PPIAF. URL: <http://web.mit.edu/urbanupgrading/waterandsanitation/resources/pdf-files/WaterTariff-1.pdf> [Accessed: 20.07.2010]

WHITTINGTON D. (2006): Pricing Water and Sanitation Services. Human Development Report 2006. Human development office-occasional paper. New York: UNDP. URL: hdr.undp.org/en/reports/global/hdr2006/papers/whittington.pdf [Accessed: 20.07.2010]

TREMOLET S. & HUNT C.: Taking Account of the Poor in Water Sector Regulation. Water Supply & Sanitation Working Notes. Note No. 11, August 2006. World Bank. Source: <http://vle.worldbank.org/bnpp/files/TF050345reformofurbanwatersupplyandsanitation11.pdf> (accessed 10.06.2010)

LE BLANC D. (2008): A Framework for Analyzing Tariffs and Subsidies in Water Provision to Urban Households in Developing Countries. New York: DESA Working Paper n° 63. URL: http://www.un.org/esa/desa/papers/2008/wp63_2008.pdf [Accessed: 20.07.2010]

SSWM is an initiative supported by:



Compiled by:

