



# **Water in Africa: Hydro-Pessimism or Hydro-Optimism?**

# **Água em África: Hidro-pessimismo ou Hidro-optimismo**

**Centro de Estudos Africanos da Universidade do Porto**  
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# Integration of informal business models into water supply operations:

## International practices and the case of Maputo

By

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Águas de Moçambique is a company owned by Águas de Portugal (AdP) that operates the water supply in Maputo, the capital of Mozambique.

In 2006 AdP asked Engineers Without Borders Program of TESE (TESE-EWB, Development NGO) to carry out a study focused on i) Commercial losses, and ii) Informal Water Vendors, in Maputo.

The study aimed at helping the company to better understand the problem, but especially to present suggestion on how to deal with it.

TESE-EWB carried out a detailed study of the situation of water supply in Maputo, including collecting and analyzing second source information, as well as field research and questionnaires to informal vendors and clients. It also included a benchmark of international best practices and lessons learned. The findings and suggested approach were presented in November 2006.

**This presentation is based on the main outcomes of the study.**

# Content

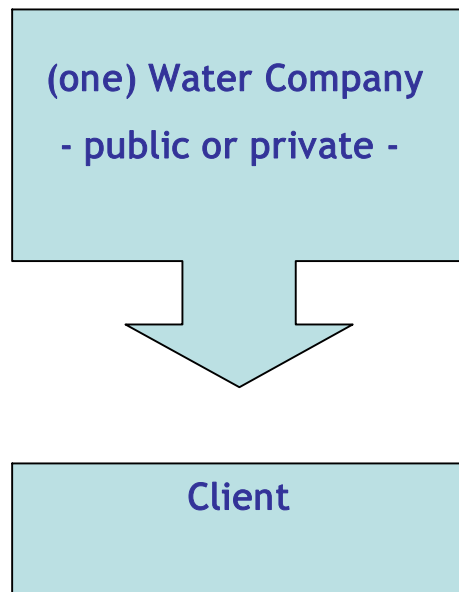
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# 1. Setting the Scene

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## The Standard Water Supply Model



Water Company sells water to clients that regularly receive an invoice

- The most common, and “simple” model;
- Direct relation between Provider and Client;
- Based in Household connection with connection fee;
- Model of Full recovery of costs => Tariff system
- Feedback and complaints mechanisms accessible to all clients (via mail, e-mail, website, company kiosk etc.)

# 1. Setting the Scene

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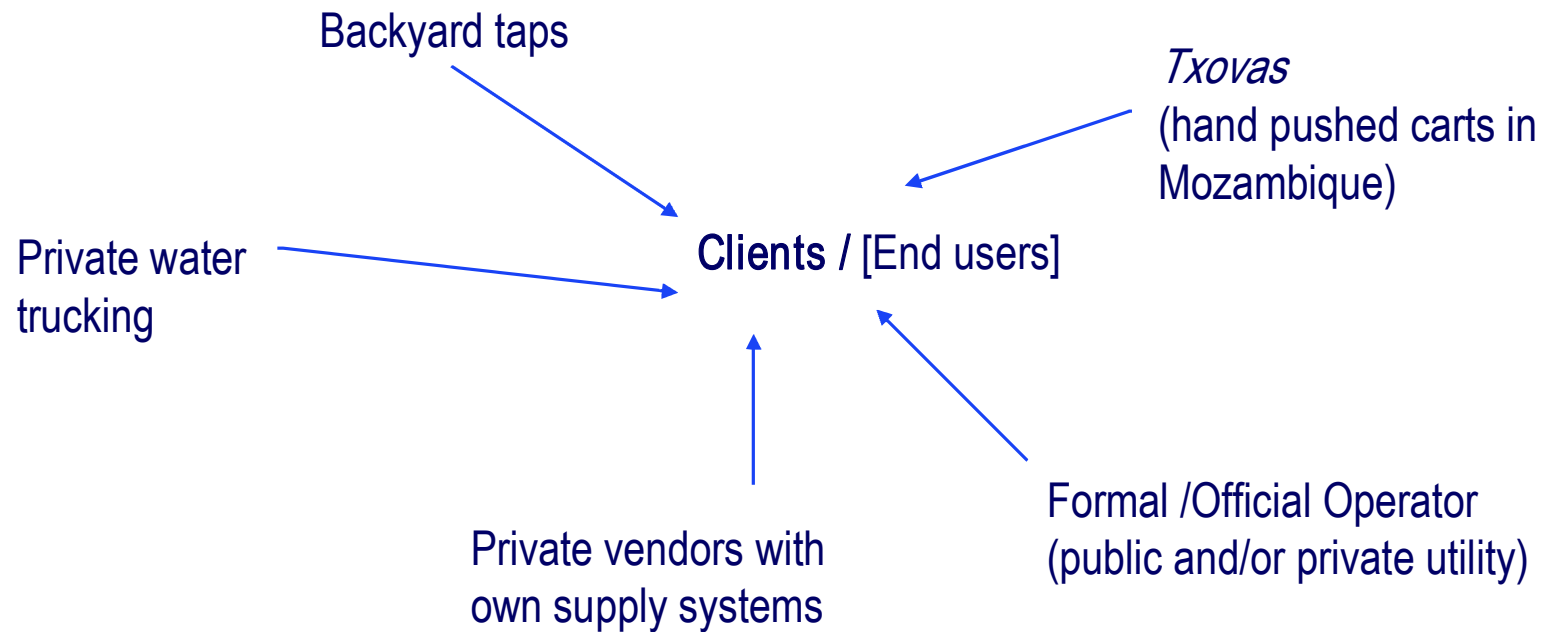
## The Standard Water Supply Model... DOES IT WORK in Developing Countries?

- The poor are often excluded because....
  - they can't pay for connection fee ...
  - level of service is unaffordable
  - ... they are outside the area of network coverage
- High **maintenance costs** of distribution networks in poorly funded companies – making it difficult to achieve full cost recovery.
- Low income areas become a **lower priority** for maintenance
- Poorer water users are **less heard in the claims** for water rights.

## 1. Setting the Scene

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But there are other water providers.... It is NOT a MONOPOLY after all!



## 2. Exploring the Practices

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There are quite a number of examples of Inclusion of informal water suppliers.

- Water Kiosks in Kibera, Nairobi (Kenya)
- Water Supply to Low-Income Urban Communities through Teshie Tanker Owner Association, (Ghana)
- Small Scale Independent Private Water Providers in 8 Asian cities: Cebu (Philippines) Delhi (India), Dhaka (Bangladesh), Ho Chi Mihn (Vietnam), Jakarta (Indonesia), Katmandu (Nepal), Shangai (China), Ulaan Bator (Mongolia)
- Financing Household connections for the poor in per-urban areas in Cote d'Ivoire
- Small Private Operators in small towns in Mauritania
- Small-Scale Water Providers in Serving the Poor in Metro Manila (Philippines)
- Control of "pipeiros" (water truckers) by Prolagos (Brazil)



## 2. Exploring the Practices:

### Case I – Water Kiosks in Kibera, Kenya

- 500.000 people live in 250hectars with only 25km water distribution network;
- Low water production capacity >> water is directed to high income areas;
- 650 water kiosks supply water “stolen” from water mains, with questionable quality;
- Water kiosks charge a 1.30USD/m<sup>3</sup>, 8 times higher than regulated cost.

New water law in 2004, created a legal framework that allows informal water vendors (Kiosks) to operate and fosters competition

- 500 informal water vendors joined in an Association;
- Water vendors become clients of the Operator;
- Operation procedures were established aiming to increase quality of service and transparency;
- Institutional relations with all water actors were established.



In mid 2005 the Associations and the Operator were working together to regularise illegal connections and expansion of secondary network.

## 2. Exploring the Practices:

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### Case I – Water Kiosks in Kibera, Kenya

#### Why is it worth it?

-The inhabitants of Kibera, among the poorest of the country, did not have secure access to water supply, and were paying considerable higher prices than rest of the population;

-Population of Kibera were spending USD 5.7 million while Operator had an annual income of USD 11.7 million;



**If water consumed in Kibera was charged at retail price, the Operator would increase by 5% its annual income, with limited need for investment.**

## 2. Exploring the Practices:

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### Case II - Teshie Tanker Owner Association (Ghana)

- Teshie is a low income area near Accra with very limited water supply;
- Tanker owners (from construction companies) have taken the opportunity to develop a parallel business supplying water to residents;
- There was no regulation of the operation, no control over the prices, the frequency of service and water quality.

Although the government didn't consider the scheme as a strategy for the future, it recognised that for the time, it provided a service that the Official water company could not meet

- Creation of 2 Associations of Tanker Owners
- Creation of water collection points for Tankers;
- Establishment of a contractual relation between Associations and the Operator
- Establishment of a special tariff for Water tankers, and measures for water quality and price control.

## 2. Exploring the Practices:

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### Case II - Teshie Tanker Owner Association (Ghana)

#### Why is it worth it?

- Increased quality, as Associations have to control water tankers;
- Operator started charging Associations, hence it increased its income;
- Reduction of illegal activities >> increasing the business



More people become served by the Water Tankers distribution

Solution has expanded across the Municipality of Accra

## 2. Exploring the Practices:

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### Case III - Small Scale Independent Water Providers Asian cities

A 2003 study by the Asian Development bank in 20 cities concluded that Public and Private Operators have not yet achieved a significant increase in water supply:

- High Connection fees:
- Limited water available is directed to high income areas;
- Lower consumption levels make poor areas less “interesting” for investments
- “Illegal” land use inhibits operators to expand network
- Inadequate levels of service to meet the needs of the poor
- Payment methods are not flexible
- Difficult communication between Operator employees and poor residents

## 2. Exploring the Practices:

### Case III - Small Scale Independent Water Providers Asian cities

Type of Supply	Investment level	Initiative level	Relation to Operator	Financial Risk	Level f Risk
Partners of Operator	Very low	Very low	Strong	Very low	Low (backyard taps)
Re-sellers	Very low	Low	Strong	Very Low	-
<i>Carters &amp; Water Carriers</i>	Low	Low	Weak to strong	Low	Medium (water delivered at home)
Water tankers	Medium / High	Low	Weak to strong	Medium (Tankers are used in construction operations)	Medium (water delivered at home)
Supply Sistem	Medium	Low	Weak to strong		Medium to High (Household connections with pipes/ hoses)

Informal Vendors ensure a considerable part of the supply: 6% in Delhi, 10% in Dhaka, 5% in Katmandu, 36 % in Cebu, 19% in Ho Chi Minh City, 44% in Jakarta (4 million) and 13% in Ulaan Baatar.

## 2. Exploring the Practices:

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### Case III - Small Scale Independent Water Providers Asian cities

A detailed information from 8 cities directs the ADB to the following conclusions:

Informal water vendors (IWV) have competitive advantages:

- Diversity of supply models, adaptable to different realities;
- Low cost of connection fees;
- Closer relation between provider and consumer, and better communication.

It is essential to enroll IWV in the process of increasing water supply:

- Create a legal framework, Include IWV in Supply strategies & allow IWV to access funding options
- The study also concludes that “**People use IWV because they supply the right service at the right price**”, this obviously seems to ignore that in many cases it is the **ONLY** service, at **ANY** price.

### 3. Looking deeper into Maputo

Mozambique: 19.1 million inhabitants

Maputo: 1.8 million inhabitants

#### Mozambique

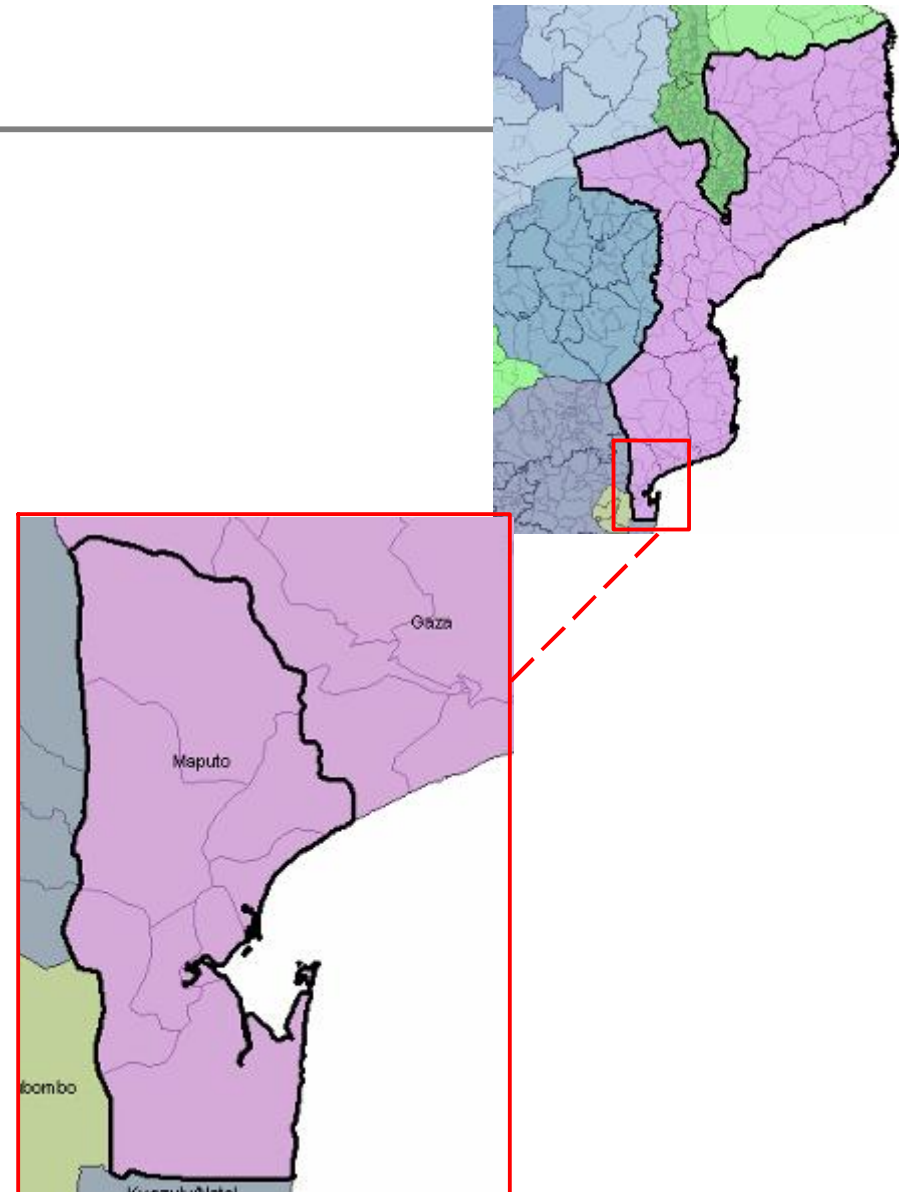
Access to improved water source: 43%

#### Maputo

Access to improved water source ~ 33%

(Formal)

Human Development Index: 168





### 3. Looking deeper into Maputo

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• **Oficial Water Operator, Águas de Moçambique (AdeM)** - Private company responsible for the management of the water production and distribution.

• **Small Scale Informal Providers**

Txovas : Hand pushed carts that carry up to 15 cans of 20 liters each, to sell from house to house.

(Estimate less than 0.7% of water supply in Maputo)

Household Connection resellers: Clients from AdeM that resell the water to 5-6 neighbors that can't afford a HH- Connection. On Average sell 26.1m<sup>3</sup> /month, charging 2 to 5 times more than AdeM.

Average water reselling income 166MTn /month (5€)

Private Water Supply Systems (PWSS) – Private entrepreneurs in peri-urban areas that collect water from own borehole, store it (10-20m<sup>3</sup> reservoir capacity) and distribute either via standpipes or Household connections. Of the estimated 200 PWSS in Maputo, 125 are in *Distrito Municipal n<sup>o</sup>4* and out of these 35 have more than 100 HH-Connections

### 3. Looking deeper into Maputo

	AdeM	PWSS
Total Population Served	● 603.500	167.821
Water charged (m3/month)	● 2.300.000	between 391.767 and 224.475
Ner of Household Connections (HC)	● 95.000	5.438
Connection fee	2350 MTn	1500 MTn (estimat) ●
Time for instaling a HC	20 days	1 a 2 days ●
Payment type for connection fee	imiedate payment	Possibility to pay in instalments ●
Daily time of service	Average 12h/day (var. 6-22h)*	frequently >15h/day ●
Pop. Served	503.500	28.821
Average monthly water volume	19m3	14m3 (estimat)
Price per m3	● Esc I = 100 MTn (10/m3); Esc. II =17.5MTn	22.5MTn (flat rate)
Monthly water charge	● 200MTn	260MTn **
Paymento of monthly bill/charge	Monthly pay (imiedate)	Possibility to pay in instalments ●
Ner of Standpipes	200	278
Population served	100.000	139.000
Average water charge	● 250MTn/20litres	500MTn/20litres

### 3. Looking deeper into Maputo

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#### PWSS seem to have comparative advantages:

1. Better Customer relation, that meets the needs of the poor
  - a. They respond faster to request for installing Household connections.
  - b. They allow for payment in instalments
2. Longer periods of service (frequently >15H/day)
3. They provide the service in areas where the Formal Operator doesn't, nor will be soon

#### ... but some concerns are also raised by PWSS operations

1. Water quality issues. Some “irregular” control is reportedly made by MISSAU
2. Higher prices, specially on stand pipes
3. Lack of control over (raw) water resources
4. Technical challenges – No guidelines or procedures for installing equipments

## 4. What could work in Maputo

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Scenario A – “No Action”

**No Gains**

Scenario B – PWSS maintain own operation in a formal context, either using water from AdeM /

Water from own boreholes

Scenario C - Owners of PWSS has managers of AdeM sub-systems

**Difficult to accept by PWSS & Strong legal /institutional implications**

## 4. What could work in Maputo

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Scenario B - PWSS maintain own (formal) operation, seems to be the most viable:

- Consumers: Possibility of increased access and better control of water quality, while maintaining the competitive advantages from PWSS.
  - State: Creates a legal framework for the activity, while promoting small scale entrepreneurs.
- FIPAG: Promote expansion of access
- CRA: Clarifies the rules of operation in the water market.
  - Owners of PWSS: Maintain business, with legal and institutional framework. Easier to access funds for business promotion.
  - AdeM: Sees the rules being clearly defined, and regulator also controlling the now FORMAL suppliers. Shows the image of a company that cares, rather than demands.

## 4. What could work in Maputo

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Scenario B1 - PWSS maintain own (formal) operation using water from AdeM, seems to be the most positive:

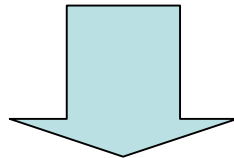
- Provides better security for consumers concerning water quality;
- AdeM gets income from selling water produces (retail price);
- DNA insures better control over Water Resources use
- Owners of PWSS – Although income might decrease (need to pay for water) this can be compensated by possibility to legally expand or by benefiting from Output Based Assistance schemes. Also have an insurance that water that they re-sell is of good quality.

....However, this scenario depends on the availability of water for AdeM to sell.

## 5. What comes out of it

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Achieving the Global Aims for “universal” access will depend on the incorporation of alternative /informal water supply models



Lessons can be learned from Global Experiences.....

## 5. What comes out of it - Lessons Learned

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**Informal Water Vendors have comparative advantages** (compared with Operator).

- Business Models adapted to different clients, including level of service, payment methods, affordability, social and physical proximity with client.

### **Win-Win-Win**

... for the Operator: Increase income by supplying re-sellers , Reduce losses (physical and commercial), clearer rules for all in the market, Better control over water quality.

... for the Vendors: Reduce the risk by being legal (access funding, no fines, etc), Decrease operation costs by having access to retail prices rather than paying as upper end of the tariff table.

... and for Consumers: Regular access to safe water supply with service level that meets the needs.



## 5. What comes out of it - Lessons Learned

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### Success factor for incorporating informal water:

- Existence of IWS that can indicate what business models may apply:
- Possibility of defining a legal framework: IWS >> Small Scale Providers (also depending on political commitment)
- Investment capacity of IWS
- Definition of a retail price of water
- Ensuring water quality, by promoting a cooperation between Operator and Small Scale Providers
- Ensure reduced price of connection fees
- Existence /Creation of Small Scale Providers association to act as formal representing body;
- Involving NGOs to act as mediators (community – providers -operator)
- Coordination between all actors

## 5. What comes out of it - Lessons Learned

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And for the consumer...

- **Involving the population**, is a key factor do ensure a business model that indeed address the needs / ability.
- **Micro-finance** is an useful tool to overcome access barriers. Its is widelly available in most developing countries and results are positive.

## TESE – Development Association

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TESE is a Portuguese Non Governmental Organisation for Development (NGOD), established in 2002 with the mission of promoting Global Partnerships for Development

TESE carries out its activities in three programs

### Engineers Without Borders (EWB)



Access to social services  
and infrastructure

Water and sanitation, energy,  
agriculture and technology.

### Create a Future



Improvement of people's  
living conditions  
Education and Health

### Social Innovation



Practical and innovative  
solutions to social needs  
Social entrepreneurship,  
Incubation of social-service.

## TESE - EWB: Development Projects in 2008

**Community management of Standpipes, Municipality of Cazenga, Luanda, Angola**  
Implementation of stand pipe management model in peri-urban areas  
Beneficiaries: 450.000 people.



**Water Supply and Capacity Building in the Municipality of Quiculungo, North Kwanza Province, Angola**  
Water Supply, capacity building for maintenance and awareness raising, in the Bonzo and Londa Villages  
Beneficiaries: 1.000 people.



**UTOMI - Multi-sectoral program for Community development in Inhafoco, Mozambique**

- Construction of community center and kindergarten
- Water supply and Sanitation
- Construction and equipment of health unit
- Income generating activities.

Beneficiaries: 4000 people

[www.tese.org.pt/utomi](http://www.tese.org.pt/utomi)

## TESE - EWB: Consultancy Services (some examples)

**Funding Opportunities for the Energy Sector, 2007.** Identification of funding opportunities for the energy sector in Mozambique, and project redesign in order to maximize the impacts and the financial feasibility.  
Client: GALP Energia.

**Promotion of access to modern energy sources in Guinea-Bissau, 2006.** Project formulation, field recognition and preparation of application to ACP-EC Energy Facility. Client: Petrogás (Guinea-Bissau) / GALP Energia (Portugal). Budget/ Funding: 1.7M€/1.3M€.

**Strategy, coordination and programming in the water and sanitation in São Tomé e Príncipe, 2006.** Project Preparation and application for funding to ACP-EC Water Facility. Client: São Tomé e Príncipe Ministry of Natural Resources and Environment.  
Budget/Funding: 1.3M€/1.0M€.

**Socio-economic characterisation research study of rural communities in the South Kwanza Province , Angola, 2007.** Survey and analysis of socio-economic characteristics of the rural communities in South Kwanza.  
Client: Government of the South Kwanza Province

**Survey of opportunities in São Tomé e Príncipe, 2006.** Identification of funding and intervention opportunities in the water and sanitation sector in São Tomé e Príncipe. Client: Irmãos Cavaco.

## TESE- EWB: Team

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