Successful Private Sector Participation in Water Utilities in Small Towns in Colombia

By Dr. Menahem Libhaber
Lead Specialist, LAC Region
Presented in the Water Week, March 1-3, 2005
### Background: Population Distribution According to Municipal Categories

<table>
<thead>
<tr>
<th>Municipality Category</th>
<th>Number of Municipalities</th>
<th>Population 1997 (thousands)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Inhabitants</td>
<td>Urban/cities</td>
</tr>
<tr>
<td>&lt; 12.000</td>
<td>866</td>
<td>3,188</td>
</tr>
<tr>
<td>12.001 - 70.000</td>
<td>140</td>
<td>3,804</td>
</tr>
<tr>
<td>&gt; 70.000</td>
<td>16</td>
<td>1,820</td>
</tr>
<tr>
<td>State Capitals &lt; 100.000</td>
<td>11</td>
<td>377</td>
</tr>
<tr>
<td>State Capitals &gt; 100.000</td>
<td>12</td>
<td>3,440</td>
</tr>
<tr>
<td>Metropolitan Center</td>
<td>9</td>
<td>12,935</td>
</tr>
<tr>
<td>Suburbs Zones</td>
<td>37</td>
<td>2,497</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>1,091</strong></td>
<td><strong>28,061</strong></td>
</tr>
</tbody>
</table>

Total Population: 40 million
Background: Water and Sanitation Coverage in Colombia as Indicators of Sector Performance

<table>
<thead>
<tr>
<th></th>
<th>Major Cities (more than 500,000 hab.)</th>
<th>Intermediate Cities (12,000-500,000 hab.)</th>
<th>Small Cities (2,000-12,000 hab.)</th>
<th>Rural Areas (Less than 2,000 hab.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water</td>
<td>96%</td>
<td>87%</td>
<td>82%</td>
<td>40%</td>
</tr>
<tr>
<td>Sanitation</td>
<td>88%</td>
<td>87%</td>
<td>60%</td>
<td>16%</td>
</tr>
</tbody>
</table>

Coverage values do not reflect quality of service since even in areas with high coverage the services may be deficient.
Background: Effective Coverage and UFW Water in Colombia as Indicators of Quality of Service

<table>
<thead>
<tr>
<th></th>
<th>Major Cities</th>
<th>Intermediate Cities</th>
<th>Small Municipalities</th>
<th>Rural Areas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Effective water coverage reflects continuous supply of 24 hours per day of potable water of quality which complies con with the standards prescribed by the Law</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The Unaccounted For Water Index in most of the Colombian municipalities is higher than 50%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Background: Commercial Management in the Water Sector in Colombia
Asset of the Public Utility of Soledad
Before PSP

Destroyed infrastructure and very poor environmental conditions
Assest of the Public Utility of Soledad
Before PSP

Tank not finished

Collapsed infrastructure
Poor Neighborhoods in Cities in the Caribbean Coastal Zone of Colombia
Water Supply in Cities in the Caribbean Coastal Zone of Colombia, Wheelbarrow
Water Supply and Solid waste Services in Cities in the Caribbean Costal Zone of Colombia, Horse Drawn Carriage

“Villa Rosa” Neighborhood

“Las Colonias” Neighborhood
Water Supply in Cities in the Caribbean Coastal Zone of Colombia, Bucket Distribution Center
Water Supply in Cities in the Caribbean Coastal Zone of Colombia, Tankers
Private Sector Participation (PSP) as an Instrument for Institutional Improvement

An effective method for rapidly improving the performance of inefficient public water utilities is the incorporation of the private sector in the provision of the services.

Examples: Cartagena, Barranquilla, La Paz, Buenos Aires.
The Concept of the Water Sector Reform in Colombia (1)

Intermediate cities and small municipalities suffer the lowest level of the water and sanitation (W&S) services.

In this type of cities the backlog in W&S infrastructure is great and the user’s capacity to pay as well as tariffs are low.

Without public sector subsidies (central and/or local government) there is no possibility to mobilize the resources required for investments.
The Concept of the Water Sector Reform in Colombia (2)

The Government would provide adequate subsidies to intermediate cities and small municipalities on three principal conditions:

- To ensure the sustainability of services in the municipalities recipients of government support, these municipalities and their utilities must commit to incorporate the private sector in their management, since PSP is an effective instrument to improve the quality of W&S services
- The Mayors commit to increase tariffs to the maximum socially acceptable level
- The government subsidies will benefit only the poor, while the rest of the population will pay the real cost of services
The Operation with Investment Model
Optimization of Costs

Water Bills

Average Tariff x Volume Sold

Financing Costs

Investment Costs (Capex)

Operation and Maint. Costs (Opex)

Revenues

Costs

Optimized Costs

Financing Costs

Capex

Opex
Reality Versus Necessity

Investments

Profits

Financing

Revenues Based on Current Average Tariff

Required Subsidy

Investments

Profits

Financing

O$M

Required Revenues
The Operator’s Capacity of Investment

Present Value of Investments

Year 1
Investment 1

Year 2
Investment 2

Year n
Investment n

US$
Program of Works and Investments (POI)

Private Resources
Equivalent to the present value of the annual resources available for investments

Public Resources
Contribution of the Central and Local Governments

Operation with Investment Model
(with subsidies to complete investments)

Year
5 10 15 20 25

Program of Works and Investments (POI)
Operation with Investment Model
(with subsidies to complete investments)

Private Resources
Equivalent to the present value of the annual resources available for investments

Public Resources
Contribution of the Central and Local Governments

Program of Works and Investments (POI)

<table>
<thead>
<tr>
<th>Year</th>
<th>Management Contract</th>
<th>Full Concession</th>
</tr>
</thead>
</table>
Operation with Investment Model (with partial subsidies)

- **RECURSOS PRIVADOS**
  - Equivalente al Valor presente de los recursos esperados por excedentes.

- **RECURSOS ESTATALES**
  - Vigencias futuras Ley 60
  - Aportes Nación certificados

**Monto de Inversiones**

**Años**

0 5 10 15 20

**POI**
Level of Subsidies Versus Targets of Service

Service coverage target with complete subsidy

Service coverage target with partial subsidy

Investments

Service Targets

Year

5 10 15 20 25

POI
Origen del Aporte del Sector Privado

Ing0

Gastos

$\text{Ing}_T$

Déficit Operacional

Margen Operacional

APORTE PRIVADO

Año 3

tiempo
### Water Utilities which have Incorporated the Private Sector with Bank Support

<table>
<thead>
<tr>
<th>Name of Municipality</th>
<th>Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soledad</td>
<td>360,000</td>
</tr>
<tr>
<td>San Juan</td>
<td>26,000</td>
</tr>
<tr>
<td>San Marcos</td>
<td>33,000</td>
</tr>
<tr>
<td>Sabana Grande and Santo Tomas</td>
<td>42,000</td>
</tr>
<tr>
<td>Maicao</td>
<td>100,000</td>
</tr>
<tr>
<td>Sincelejo and Corozal</td>
<td>280,000</td>
</tr>
<tr>
<td>El Banco</td>
<td>50,000</td>
</tr>
<tr>
<td>Baranoa and Polonuevo</td>
<td>62,000</td>
</tr>
<tr>
<td>Arjona and Turbaco</td>
<td>150,000</td>
</tr>
<tr>
<td>ERAS</td>
<td>250,000</td>
</tr>
<tr>
<td>Nataga</td>
<td>2,500</td>
</tr>
<tr>
<td>Cartagena</td>
<td>850,000</td>
</tr>
<tr>
<td>Barranquilla</td>
<td>2,000,000</td>
</tr>
</tbody>
</table>
## Background: PSP in the Water Sector in Colombia is Successful and the Demand for PSP is high

<table>
<thead>
<tr>
<th>Indicators</th>
<th>Cartagena</th>
<th>Barranquilla</th>
<th>Tunja</th>
<th>Common Values in Industrialized Countries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of employees</td>
<td>1,300</td>
<td>272</td>
<td>929</td>
<td>813</td>
</tr>
<tr>
<td>Number of employees per 1,000 connections</td>
<td>15</td>
<td>2.3</td>
<td>5.5</td>
<td>3.3</td>
</tr>
<tr>
<td>Water coverage</td>
<td>68%</td>
<td>91%</td>
<td>89%</td>
<td>94%</td>
</tr>
<tr>
<td>Sewerage coverage</td>
<td>56%</td>
<td>72.4%</td>
<td>74%</td>
<td>78%</td>
</tr>
<tr>
<td>% of domestic metering</td>
<td>30%</td>
<td>99%</td>
<td>25%</td>
<td>60%</td>
</tr>
<tr>
<td>Number of connections</td>
<td>84,143</td>
<td>117,194</td>
<td>180,717</td>
<td>241,902</td>
</tr>
<tr>
<td>Unaccounted for water</td>
<td>60%</td>
<td>41%</td>
<td>46%</td>
<td>42%</td>
</tr>
<tr>
<td>Production capacity (m³/sec)</td>
<td>1.6</td>
<td>3.1</td>
<td>7.5</td>
<td>8.2</td>
</tr>
<tr>
<td>Continuity of service (hrs/day)</td>
<td>7</td>
<td>24</td>
<td>18</td>
<td>24</td>
</tr>
<tr>
<td>Response to complaints (days)</td>
<td>6</td>
<td>1.3</td>
<td>2</td>
<td>1.7</td>
</tr>
<tr>
<td>Connections in poor areas (strata 1 and 2) as percentage of new connections installed in 1995–99</td>
<td>98%</td>
<td>86%</td>
<td>79%</td>
<td></td>
</tr>
</tbody>
</table>

* The water utility of Barranquilla incorporated private sector management first in 1993, when utility management was undertaken by local entrepreneurs. In 1995, an experienced foreign private operator was hired. Comparison of the current performance with the performance of the public utility before 1993 would reveal more impressive progress than presented in the table.

Source: Ministry of Economic Development.
Constructor-Operator Model
Also for small municipalities (with populations of less than 12,000) the principle of PSP can be applied, since it was noted that the private sector is active even in that environment (the Aguateros in Paraguay). Large operators have interest in large systems and small operators have interest in small systems. The model which was developed for small municipalities is the Constructor-Operator Model.
The Constructor-Operator Model (1)

The principle is similar to the Operation with Investment Model, with two differences:

- The majority of the population in small municipalities is poor, the tariffs are low and the investment backlog is great, consequently the investment subsidy provided by the public sector must be larger.

- Private operators of this type are nonexistent and so the model needs to motivate their creation. This type of operators do not need to have operation experience.
The Constructor-Operator Model (2)

- The creation of the small operators is done utilizing the “constructor-operator” principle, i.e., publishing a bidding process for the construction of works in the small municipality which include the condition that the winning bidder will commit to operate the system during a period of ten years initiating on the date of signing the contract.

- To test if the model is viable a pilot program was implemented with success in two small municipalities, one with a population of 2,500 inhabitants and the other with a population of 10,000 inhabitants.
Objective: PSP in Municipalities with populations of less than 12,000 inhabitants

Duración: 10 – 15 years

Phases:
- Phase 1: Construction and optimization of the systems during 1-2 years, in parallel to their operación
- Phase 1: Operation and maintenance of the systems during the rest of the contract period

Financing scheme:
- Contributions of the central government and the Munic.
- Contributions of the operator (surplus of cash flow)

Maximum subsidy US$ 500 per connection
MODELOS DE PARTICIPACION DEL SECTOR PRIVADO

Practica Comun

- Prestador del Servicio
- Propietario de Activos

OPERACION ESPECIALIZADA

- Contrato de Arrendamiento
- Operación Simple
- Arrendamiento
- Concesión
- BOT/BOO

VERSOS DEL SECTOR PRIVADO

- Alto
- Bajo

RIESGO DEL SECTOR PRIVADO

- Costo Político del Ajuste y Esfuerzo Regulatorio

EFICIENCIA Y CALIDAD

- Muy baja
- Alta

PRIVATIZACION DEL SERVICIO

- Venta de Activos

ESTATIZACION

- Privatización del Servicio

Participación del ESTADO

- Prestador del Servicio

Función Regulatoria

- Alta

Participación del ESTADO
MODELOS DE PARTICIPACION DEL SECTOR PRIVADO

La Reforma en Colombia

OPERACIÓN ESPECIALIZADA

Control Simple
Arrendamiento
Operación con Inversión
Concesión
Venta de Activos/BOT/BOO

Costo Político del Ajuste y Esfuerzo Regulatorio

EFICIENCIA Y CALIDAD
The Recipe for Success of PSP

Strong and Sustained Political Support
Financial Feasibility
Competitive Contracting
Incentives for Improvement
Regulate by Results
The Common Myth:
The Private Sector Serves Only the Rich
Quienes se beneficiaron de las conexiones adicionales de acueducto durante 1995-2000?

La suma de los % por estrato de cada empresa alcanza 100%

El Desempeño del Sector Privado en la Prestación de los Servicios a la Población de Menores ingresos

La suma de los % por estrato de cada empresa alcanza 100%

Bogotá - EAAB  Cartagena - ACUACAR  Barranquilla - AAA
CRECIMIENTO DE ABONADOS POR ESTRATOS

ACUEDUCTO

ALCANTARILLADO
Who benefited from the incremental water connections?
(1995-99)

- Bogota - EAAB
- Medellín-EPM(ESP)
- Cartagena - ACUACAR
- Barranquilla - AAA
- Manizales
- Tunja-Sera.q.a
Who benefited from the incremental sewerage connections?
(1995-99)
Coverage increment per stratum, residential and total - Water (1995-99)
Coverage increment per stratum, residential and total - Sewerage (1995-99)

Stratum 1 Stratum 2 Stratum 3 Stratum 4 Stratum 5 Stratum 6 RESIDENTIAL TOTAL

Bogota - EAAB Cartagena - ACUACAR Barranquilla - AAA Tunja-Sera.q.a
Examples
Example 1

Operation with Investment Contract in

Soledad - Colombia
Location and Social Conditions in Soledad

- Unemployment: 38%
- Shortage of School: 14,000 places
- Violent deaths during 2003: 165

Growth due to Forced Displacement in 2003: 6,000 people
Population growth rate: 4%
Composition of the Users in Soledad: Mainly the Poor that need Government Subsidies

- Poor neighborhoods: 98.74%
- Comercial: 1.10%
- Industrial: 0.04%
- Oficial: 0.12%

Mainly the Poor that need Government Subsidies.
Fast and Positive Impact was Generated based on a Crash investments Program of US$ 2.5 million. Financed by the Government through the World Bank Loan.

**Contract Targets:**

- Improve the quality service to 362,000 inhabitants
- Increase water supply coverage from 43% to 75%
- Increase sewerage coverage from 36% to 68%
- Increase service continuity from 12 hours to 18 hours
- Support an investment program of US$ 20 million
Soledad financing sources are

- Gov. - World Bank: $4.000 millions (US$ 2.5 million)
- Triple A: $22.000 millions (US$ 7.5 million)
- Municipal Subsidy and other sources: $34.000 millions (US$ 10 million)

**TOTAL**: $60.000 millions

**US$20 millions**
Soledad: Performance During the First Two Years of the Contract

<table>
<thead>
<tr>
<th>Indicators</th>
<th>Units</th>
<th>Soledad 2001</th>
<th>Soledad 2003</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water supply coverage</td>
<td>%</td>
<td>43</td>
<td>73</td>
</tr>
<tr>
<td>Sewage system coverage</td>
<td>%</td>
<td>41</td>
<td>64</td>
</tr>
<tr>
<td>Users</td>
<td>Unit</td>
<td>59.677</td>
<td>68.537</td>
</tr>
<tr>
<td>Measured users</td>
<td>Unit</td>
<td>20.540</td>
<td>36.722</td>
</tr>
<tr>
<td>Water production capacity</td>
<td>Hm3/month</td>
<td>3.6</td>
<td>4.3</td>
</tr>
<tr>
<td>Continuity</td>
<td>h/day</td>
<td>12</td>
<td>18</td>
</tr>
<tr>
<td>Averia response time</td>
<td>%</td>
<td>52</td>
<td>90</td>
</tr>
<tr>
<td>Employees/1000 users</td>
<td>E/1000U</td>
<td>5</td>
<td>2,1</td>
</tr>
</tbody>
</table>
Improvements in Efficiency and Rational Use of Water

No Usuarios - M3 Facturados

<table>
<thead>
<tr>
<th>Mes</th>
<th># Usuarios</th>
<th>M3 Facturados</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- 60.000
- 62.000
- 64.000
- 66.000
- 68.000
- 70.000
- 72.000

- 800.000
- 850.000
- 900.000
- 950.000
- 1.000.000
- 1.050.000
- 1.100.000
- 1.150.000
- 1.200.000
- 1.250.000

# Usuarios

- Agua Facturada (m3)
Improvement in Commercial Management

Indice de Recaudo

- Ene-02: 50%
- Feb-02: 53%
- Mar-02: 58%
- Abr-02: 68%
- May-02: 69%
- Jun-02: 73%
- Jul-02: 72%
- Ago-02: 78%
- Sep-02: 73%
- Oct-02: 74%
- Nov-02: 67%
- Dic-02: 76%
- Ene-03: 88%
- Feb-03: 76%
- Mar-03: 73%
- Abr-03: 77%
- May-03: 79%
- Jun-03: 75%
- Jul-03: 99%
- Ago-03: 87%
- Sep-03: 88%
- Oct-03: 89%
- Nov-03: 87%
- Dic-03: 78%
La gestión comercial es flexible y responde a las características de los usuarios.
El trabajo con el equipo está orientado a fortalecer el grupo y mejorar sus competencias para optimizar la gestión.

**CLIENTE**
- CONOCIMIENTO
- SEGMENTACION
- GESTION DIRECTA

**Gestión**
- COHERENCIA EN EL MENSAJE
- PRIORIDAD GESTION SOBRE SUSPENSION
- RESPUESTA OPORTUNA
- SEGUIMIENTO UNO A UNO DE LOS CLIENTES
- REMUNERACION JUSTA A ALIADOS ESTRATEGICOS

**Trabajo en Equipo**
- INTERIORIZACION TODOS POR EL RECAUDO
- COORDINACIÓN Y COMUNICACIÓN
- ORIENTACION AL RESULTADO (RECAUDO)
- INDICADORES Y METAS POR UNIDAD Y ESTRATEGIA

- Puntos de Recaudo Moviles
- Implementar estrategias dinámicas y variables
- Incremento Opciones de Pago
- Capacitación y Sensibilización Comunitaria

Recaudar el 80%
Para nosotros todo contacto con el cliente es una oportunidad

Conocimiento de los Clientes

Estrategias

Resultados

Gestión Personalizada

Reconocimiento Al Pago Oportuno Cliente Estrella

Y Pague la Otra

Se Congela la Deuda Sin Interés de Mora

Convenios

Cultura de Pago Estrato 1

Jóvenes en Acción

Estimula al Cliente puntual a continuar así

Compromete al Cliente con el pago de varias facturas

Gestión de Cobro y Seguimiento de los Compromisos

Creación de Valor

TODOS POR EL RECAUDO
The Updated Targets of Service Coverage

Water supply and sewage system coverage
2002 - 2021

Coverage (%)

Year
Water supply coverage
Sewage system coverage
The Challenge in Soledad Remains to Solve the Problem of

100,000 inhabitants without water supply

150,000 inhabitants without Sewerage Service
Example 2
Constructor- Operator Contract
in
Nataga - Colombia
Constructor-Operador in NÁTAGA

- Population of 2,500 inhabitants
- Nominal coverage 79% for water and 55% for wastewater
- The main problem was continuity of service - 2 hours/day
- The contract includes investments in a water intake, water treatment, expansion of water distribution networks and of sewerage networks. It doesn’t include investments in sewage treatment.
NÁTAGA, the Bidding Process

• After having structured the constructor - Operator model and bidding documents for the Municipality of Nátaga, the bidding process was initiated in October 2000.

• Two proposals were submitted, one of a consortium of three local constructors and the other of another local constructor. Both proponents had experience in construction of water installations. The winning bidder was the local constructor Almafama, with experience in the type of works required.

• In March of 2001 he began to execute the contract.
## Financial Structure

<table>
<thead>
<tr>
<th>Contributor</th>
<th>Amount (US$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Municipality of Nátaga (Law 715/2002)</td>
<td>54,550</td>
</tr>
<tr>
<td>Government</td>
<td>200,300</td>
</tr>
<tr>
<td>Operator</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total Project Cost</strong></td>
<td><strong>254,850</strong></td>
</tr>
</tbody>
</table>
Before PSP the water bill was based on the number of water taps in each house. The payment for the first tap was US$ 0.71 per month and for any additional tap, an additional US$ 0.21 per month.

### Monthly Bill for a consumption of up to 20 m3/month

<table>
<thead>
<tr>
<th>Stratum</th>
<th>Average Monthly bill Before PSP (US$)</th>
<th>Average Monthly bill During PSP (US$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2.5</td>
<td>3.5</td>
</tr>
<tr>
<td>2</td>
<td>3.0</td>
<td>4.1</td>
</tr>
<tr>
<td>3</td>
<td>4.3</td>
<td>4.8</td>
</tr>
<tr>
<td>Commercial</td>
<td>7.3</td>
<td>7.3</td>
</tr>
</tbody>
</table>
## NÁTAGA, Performance Indicators

### Some Indicators

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Production capacity</td>
<td>1036.8 m3/dia</td>
</tr>
<tr>
<td></td>
<td>487 lt/hab/dia</td>
</tr>
<tr>
<td>Water produced</td>
<td>250 lt/hab/dia</td>
</tr>
<tr>
<td></td>
<td>8 lt/sg. año 2002</td>
</tr>
<tr>
<td>Continuity of Service</td>
<td>Increased from 2 to 24 hr/day</td>
</tr>
<tr>
<td>Water Coverage</td>
<td>Increased from 79% to 100%</td>
</tr>
<tr>
<td>Sewerage Coverage</td>
<td>Increased from 55% to 100%</td>
</tr>
<tr>
<td>Unit operational cost</td>
<td>US$ 0.03 / m3</td>
</tr>
<tr>
<td>Staff per ‘000 population served</td>
<td>1.41</td>
</tr>
</tbody>
</table>
Evolution of Water And Sewerage Coverages Rates

TABLA DE CRECIMIENTO SUSCRIPTORES ACUEDUCTO Y ALCANTARILLADO
2000-2003

79%  80%  90%  100% 100%
55%  57%  66%
Fotografías

Water Treatment Plant “Before”
Water Treatment Plant “After”
• The Nátaga case has proved that the constructor-operator is a PSP model which can be successful for small municipalities in Colombia.

• It is too early to withdraw final conclusions. It appears that in order to achieve sustainability in investments, Government should provide a permanent follow-up of the projects.
IMPACT OF PRIVATIZATION
BEST STUDIED IN LATIN AMERICA
(Center for Global Development)

- LARGE AMOUNT OF INFRASTRUCTURE PRIVATIZATION
- HOUSEHOLD EXP. & CONSUMP. SURVEYS AVAILABLE
- LARGE NUMBER OF LOCAL RESEARCHERS
FINDINGS OF PRIVATIZATION STUDIES:
(Center for Global Development)

- ACCESS UP
- EXPANSION PARTICULARLY BENEFICIAL TO POOR
- PRICES UP IN HALF OF CASES, DOWN IN OTHER HALF
- SERVICE QUALITY IMPROVES MARKEDLY
IMPROVED ACCESS
(Center for Global Development)

- **Peru** telecom
  - electricity + 33 %
- **Bolivia** telecom
  - electricity + 2.7 %
  - water + 15 %
- **Argentina** telecom
  - electricity + 11 %
  - natural gas + 30 %
Many Thanks for Your Attention