

Private Participation in the Water Sector in Developing Countries & Transition Economies

Results from the last two decades

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I. Introduction

A. What is PPIAF?

Public-Private Infrastructure Advisory Facility/ Fonds de Conseil en Infrastructure Publique-Privée

❖ **Multi-donor technical assistance grant** facility established in 1999 as a joint initiative of the UK, Japan and the World Bank.

- Funded today by 15 multilateral and bilateral donors, including DFID, World Bank, Switzerland, Agence française de Développement, Asian Development Bank and others.

- Managed by the World Bank.

- Average grant: \$230,000, Half < \$75,000

❖ **Two main windows in PPIAF:**

- **Traditional PPIAF:** Technical assistance grants mostly to governments to improve infrastructure services through **public-private partnerships**.
- **Sub-National Technical Assistance (SNTA):** Technical assistance to **public-sector operators** to help them **access market-based financing** without sovereign guarantees.

PPIAF's Knowledge Portfolio

- **PPI database** – Leading source of PPI trends in the developing world, covering data on 3,100 projects in 150 low- and middle-income countries
- **Research on emerging trends** role of local and regional investors, small scale providers
- **Research on best practices** on different topics, taking into account lessons learnt and country specificities
- **PPP Toolkits** – Roads, Ports, Water, Labor, Urban Transport
- **Best Practice Websites** with specific, easy-to-tailor references on (i) Infrastructure Regulation (BoKIR) and on (ii) Contracts, Laws and Regulations in various Infrastructure Sectors (PIRC).

I. Introduction

B. Objective of the Presentation

Overview of Two Studies on Performance Impact of PPP in Water

- ❖ **Does Private Sector Participation Improve Performance in Electricity and Water Distribution?**

By Katharina Gassner, Alexander Popov, and Nataliya Pushak.
Trends & Policy Options N.6, 2009.

- ❖ **Public-Private Partnerships for Urban Water Utilities: A Review of Experiences in Developing Countries**

By Philippe Marin. *Trends & Policy Options N.8, 2009.*

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II. Does Private Sector Participation Improve Performance in Electricity and Water Distribution?

Katharina Gassner, Alexander Popov, and Nataliya Pushak



A. Summary

1. What does the data tell us about the impact of private sector participation (PSP) on utility performance?

2. Outstanding features of the study:

- comprehensive dataset of 1,230 utilities covering all developing regions
- different forms of PSP, from divestitures to management contracts
- control group of state-owned enterprises (SOEs)

Very robust results!

3. Results:

- private sector delivers on output and efficiency targets, and leads to service quality improvements
- labor reductions are the basis of most efficiency gains
- (almost) no tariff effect associated with PSP
- weak results on increase in investment, but must be taken with caution because of problems with data.

Global study on PSP impact in water and electricity distribution (1)

- Funded by PPIAF in collaboration with the Finance, Economics and Urban (FEU) Department of the SDN Network at the World Bank.
- Idea: systematic and exhaustive sampling of PSP
 - every utility with private participation pre-2003
 - final timeframe of panel data: 1992-2005
 - Matching corporatized state-owned enterprises (SOEs) for counter-factual
- Final Sample size
 - 1,230 utilities analyzed (302 PSP and 928 SOEs) in 71 developing and transition countries
 - 252 in Electricity (161 with PSP and 91 SOEs)
 - 978 in Water (141 with PSP and 837 SOEs)
 - largest known sample collated to examine the impact of PSP

Global study on PSP impact in water and electricity distribution (2)

➤ Definition of 'PSP'

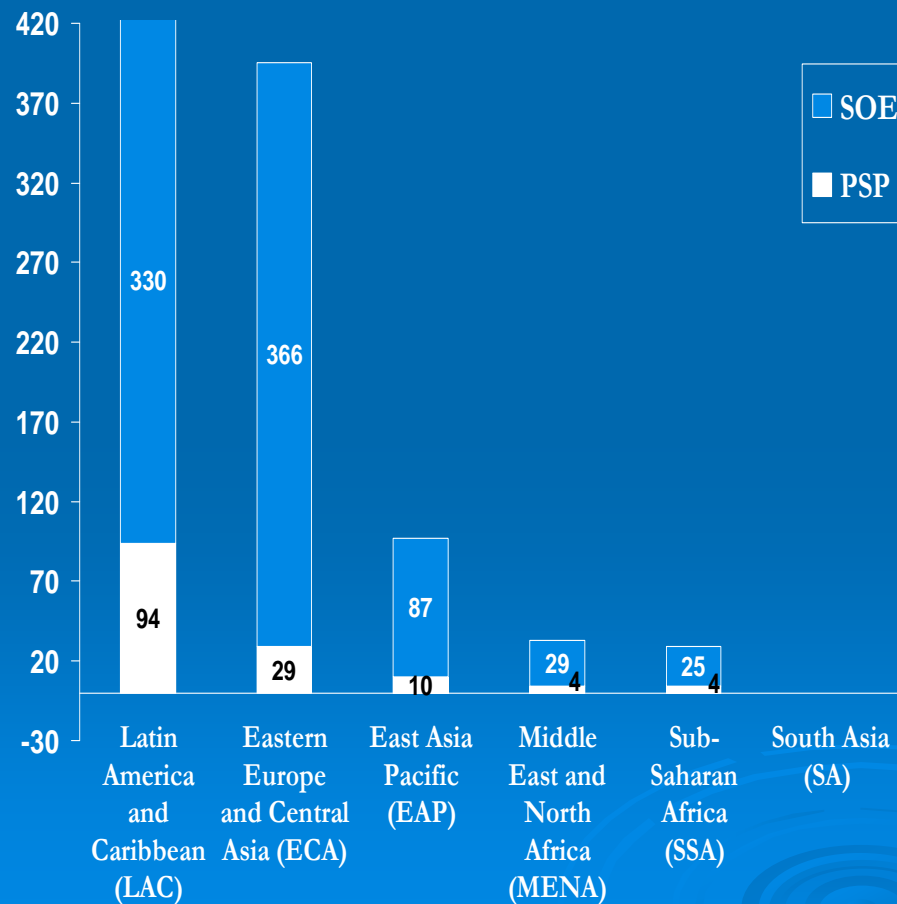
- private control/management: inclusion of a range of PSP types (full and partial divestitures, concessions, lease and management contracts)

➤ Definition of 'impact'

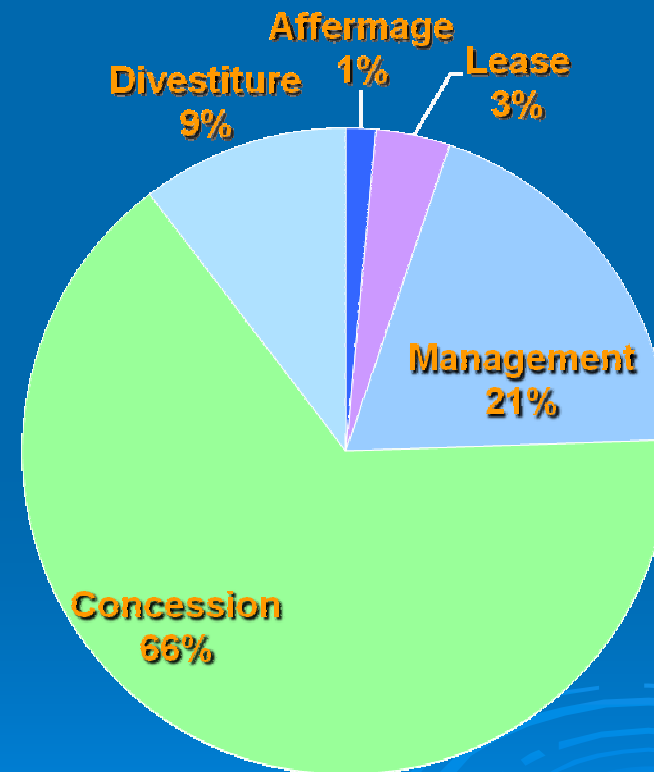
- connections, quantity of output, quality of service, operational performance (bill collection, distribution losses), labor productivity, prices, investment
- **Not a welfare analysis!** Only partial performance effects are analyzed, no aggregation is undertaken.

Sample Characteristics for Water and Sanitation

978 Utilities (141 with PSP and 837 SOEs)



Various Types of PSP



Econometric analysis

- **Sample size allows to address traditional shortcomings of empirical impact analysis:**
 - selection bias (initial conditions of companies chosen for PSP matter)
 - best possible comparators (like-with-like comparison)
 - unbalanced panel (for most utilities, only partial data is available)
- **Dual estimation strategy**
 - 1. fixed effect model with firm-specific time trends on complete panel of 1,230 utilities
 - 2. nearest-neighbor matching between PSP utilities and 'most comparable' SOEs
 - trade-off between richness of results and most rigorous estimation
 - the study emphasizes results robust in both model settings
- **Analysis takes into account**
 - transitional vs. long-term effects
 - contract differentiation

General results

- **Contract type matters: in electricity, the results are driven by divestitures, and in water and sanitation by concessions:**
 - reflects relative importance of contract type in sector sample
 - different PSP contracts have different obligations and different degrees of managerial freedom – differences in results are to be expected
 - eg bill collection rates or hours of daily water increase significantly for concession contracts
- **Long-term effects are stronger than transitional effects occurring immediately before and after the introduction of PSP**
 - some significant transitional results are observed, eg for staff reductions
 - Impact however is long lasting as shown by the strength of the long term effects of PSP.

Results suggest that PSP is associated with -

➤ **Performance Gains ...**

- 12% increase in residential connections for water utilities
- 54% increase in residential connections per worker for water utilities and a 29% increase for electricity distribution companies
- 19% increase in residential coverage for sanitation services
- 18% increase in water sold per worker and a 32% increase in electricity sold by worker
- 45% increase in bill collection rates in electricity
- 11% reduction in distribution losses for electricity and a 41% increase in the number of hours of daily water service

➤ **... and staff reductions**

- average employment falls by 24% in electricity and 22% in water following PSP

The tariff story

➤ **Only limited evidence on tariff changes is found**

- except for electricity concessions, where prices seem to have increased, no evidence of a systematic change in residential tariffs as a result of PSP

➤ **Where did the Efficiency Gains go?**

- If efficiency gains associated with the entry of PPP do not translate into higher investment or lower prices, where did they go?
 - In below –cost environment, lower price increases to users needed and/or lower subsidies from governments needed.
 - In cost-recovery pricing environments, private operators reap efficiency gains through increased profits. Absent or inexperienced regulatory authorities may play a role

The investment story

- **No overall conclusive results that investment increases following PSP ...**
 - caveat concerning data complexity: investment measured by difference in asset values in t and $t-1$; but accurate measurement of investment is tricky.
 - findings indicate that contract types matters... but only to a certain extent: as expected significant investment increases took place in [electricity] divestitures, but surprisingly, no significant increase in investment found for concessions.
 - neither private nor public sector seem to have contributed to increase investment levels after introduction of PSP.
- **However, significant increases in number of connections after PSP seem at odd with this lack of increase in financial investment.**

Looking Forward

- **Be clear on the objectives of PSP and chose PSP type accordingly.**
- **PPPs lead to output, efficiency & service quality improvements, but efficiency gains are mainly achieved through employment reductions:**
 - Have the trade-offs been made sufficiently clear from the start?
 - Note: relative size of staff reductions in overall employment is small
- **Concentrate on creating an environment for sustainable improvements in service delivery – Government's role remains crucial after the introduction of the private sector**
 - clarify investment obligations for both public and private partners in the PPP
 - Design and implement consistent and transparent tariff /subsidy policy
 - increase sector transparency and provide a certain legal and regulatory environment

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III. Public-Private partnerships for Urban Water Utilities: a Review of Experiences in Developing Countries

Philippe Marin, Senior Water & Sanitation Specialist
MENA Region, The World Bank



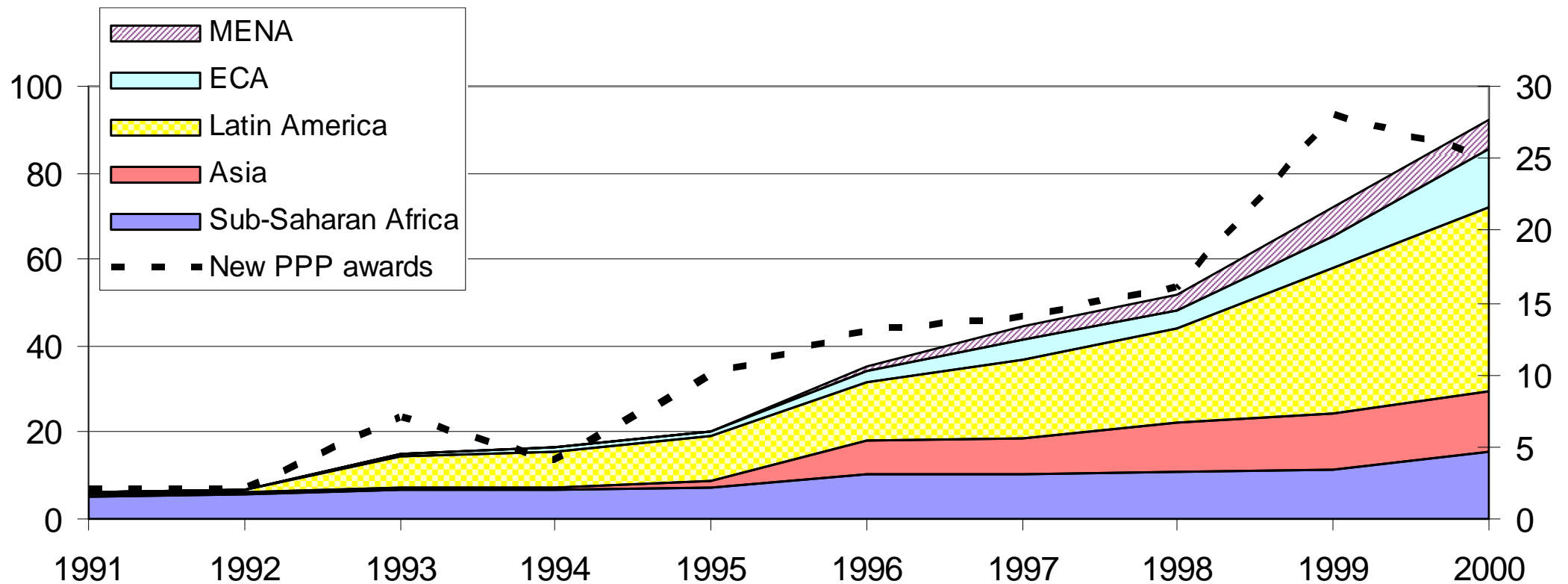
Scope of the Study

- **Objective:** Determine whether PPPs are a viable option to help reform poor water utilities in developing & emerging countries, based on objective performance data.
- **PPP projects selected:**
 - where PSP took over management of utility services,
 - urban utilities > 25,000 served,
 - with more than 5 years of contractual operation (3 years for Mgmt Contracts)
- 1) Historical trends:** Overview and evolution of trends.
- 2) Performance review:**
 - **Before & After PPP:** Impact of Water PPPs i.e. changes after PPP was in place. (not a public vs. private comparison).
 - **Case Study Approach:** Cover 65 PPP projects: 100 million people served (half of total, 80% of target sample).

III. A. Evolution of PSP in Water Market trends

The 1992-2000 period: booming enthusiasm for water PPPs

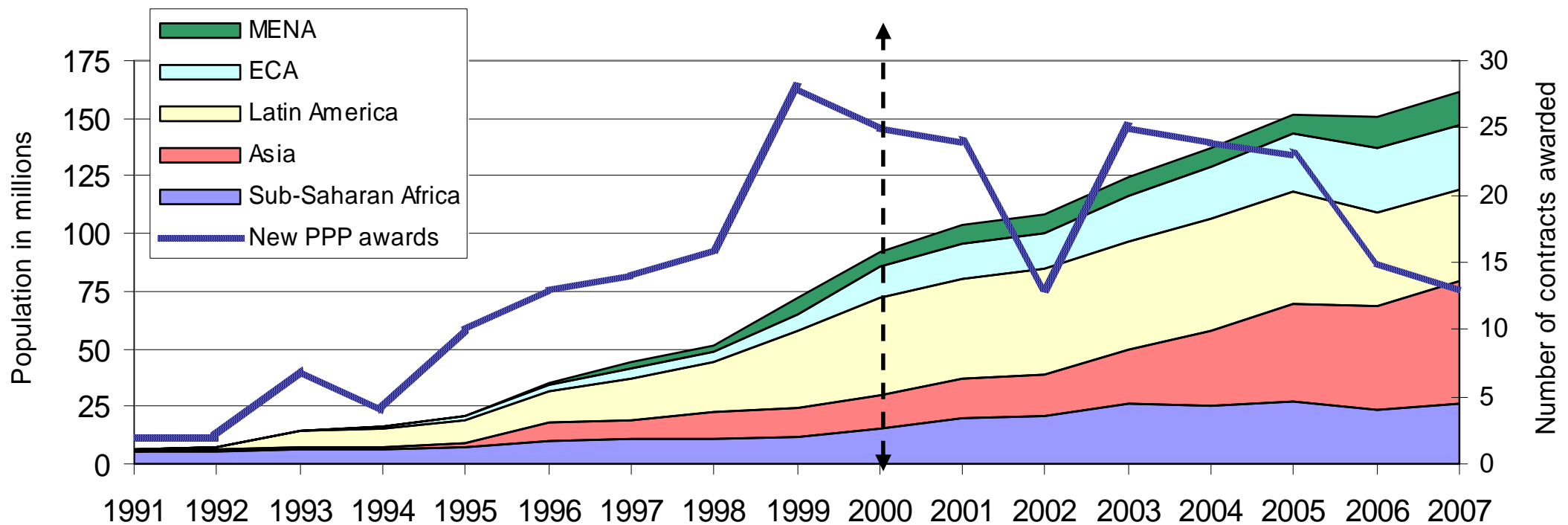
Water utility PPPs in developing countries until 2000: Urban population served by private water operators (in millions) and new PPP awards



Evolution of market since 2001: a mixed picture, but water PPP is not in retreat

Contract awards dropped in 2002, focused on a few countries, but population served kept growing (Chile, Colombia, Russia, China, Malaysia, Algeria...)

Water utility PPPs in developing countries: Urban population served by private water operators (in millions) and new PPP awards



III. B. Performance of Water PPPs

Assessing Performance of PPPs

- 4 key performance indicators:
 1. **Access to piped water (coverage expansion)**
 2. **Quality of Service**
 3. **Operational Efficiency**
 4. **Impact of PPPs on Tariffs***

- focus on the impact of water PPPs i.e. net improvement instead of contractual compliance

- Does not look at impact on [financial] investment, but rather focus on [physical] service expansion

1. PPPs and Increased Access to Piped Water

Significant achievements with PPPs since 1990

- Increase in population % served by PPP from 1% of urban pop. in 1997, up to 4% in 2004 and 7% in 2007.
 - **More than 24 million people connected to piped water with PPP projects since 1990**
- Many PPP projects performed well in expanding access to piped water:
 - Colombia (Cartagena, Baranquilla, Monteria), Guayaquil, Brazil, Argentina, Western Africa (Cote d'Ivoire, Senegal) Casablanca, Manila... even La Paz – El Alto
 - In Côte d'Ivoire, connections more than doubled in one decade (from 3.4 million → 7.4 million, with 350,000 social connections installed).

But the outcome is below expectations

- Many concessions did not meet targets for private investment in expansion (even though it was main driver)
- A sizeable portion of these 24 M people expansion was not directly financed by the private operator:
 - Public funding: Lease contracts (Senegal, Cartagena) or grants to concessions (Colombia, Guayaquil)
 - Reinvested tariffs revenues: Cote d'Ivoire, Morocco (partly), Gabon or hybrid schemes
- Outcomes proved highly dependent on financial design of each PPP contract

2. Impact on Quality of Service

Improving Continuity of Service with PPPs

- **Service continuity:** Intermittent service is the most pressing quality issue for water in developing countries:
 - A widespread problem in the developing world
 - Water portability cannot be guaranteed
 - Accelerate deterioration of infrastructure networks.
 - The poor are disproportionately affected

- **Reducing Water Rationing:** A first step towards service continuity, efforts to reduce water rationing can dramatically improve the living conditions of the users, especially the poorest ones.

PPPs have achieved significant success in improving Service Continuity

- Colombia: long term reduction of water rationing:
 - Service continuity was re-established after five or six years in 10 PPPs granted in 1997-98 for large and medium cities.
 - PPPs for smaller cities started with more severe rationing, but were also able to re-establish service continuity. They benefitted from public grants to spearhead rehabilitation.
- Western Africa: PPPs have re-established service continuity (Dakar (Senegal) & Conakry (Guinea), and significantly reduced rationing (Niger from 18h to 21h/day)
- Asia: the East Manila Concession started in 1996 with 75% of customers subject to rationing, but was able to re-establish service continuity by 2006.

3. Impact on Operational Efficiency: Most Significant Contribution of PPPs

- Operational Efficiency measured in this study with 4 main indicators:
 - Water losses (Non-Revenue Water, NRW)
 - Bill collection rate
 - Labor productivity
 - Overall productivity: (Combines the three above, but does not include efficiency in investment)

- This is where the positive contribution of private operators has been the most consistent, over a large number of projects.

PPPs have achieved major improvements in Operational Efficiency

- **Reducing Water Losses:** Many PPPs succeeded in reducing water losses , notably in Western Africa, Brazil, Colombia, Morocco and Eastern Manila
 - No all projects achieved significant reductions (Guayaquil, Maputo, Western Manila did not).
 - In several cases, water losses difficult to measures because of estimated billing (e.g. Argentina)
- **Collection Rate:** Positive impact in most cases.
 - Success even with short term, low-powered tools, such as Management Contracts
 - Collecting bills from public institutions difficult in SSA
- **Labor productivity:** Improved in most cases
 - PPPP was associated with significant layoffs in several cases (Latin America) **but not always (Africa)**
 - Impact of PPP on labor goes beyond staffing

PPPs have achieved major improvements in Operational Efficiency (2/2)

- **Overall/combined Efficiency Improvements:** first conclusions (but not full impact on efficiency, as changes in investment not included):
 - **Full impact of concessions on efficiency difficult to assess** as concessionaires are responsible for operations & investment. However, a regulator's assessment showed significantly improved overall efficiency for the East Manila, but not for the West Manila concession.
 - **In leases-affermages, clear gains in operational efficiency** in cases like Senegal and Cartagena, which were passed to consumers over time through tariff reductions in real terms.
 - **In management contracts, significant efficiency gains from improved billing & payments with reductions in losses** in most cases. (Labor issues often not under operator's control).

4. Impact on Tariffs:

PPPs and tariffs: a complex issue...

Results of the study

- In most cases, PPP projects have been accompanied by tariff increases, but PPPs tends to happen in failed public utilities with initial tariff below cost recovery
- In Western Africa where initial prices were close to cost recovery levels, tariffs under PPPs mostly fell in real terms (Côte d'Ivoire, Sénégal till 2006; Gabon and Mali). Tariffs in Niger increased moderately. In both instances (Niger and Senegal in 2007), tariffs for the social tranche were left untouched by the increase.

Cautionary Note:

- Evolution of tariffs depend not only of PPP operators, but also on governments tariff & subsidy policies, and on how investment is financed,
- Recent econometric study by Gassner et al. (2009) showed a mostly neutral impact of PPP on tariff when properly compared, i.e. with similar public utilities operating under framework that foster financial sustainability.

III. C. Toward more efficient and sustainable Water PPPs

Looking Forward: (1/3)

1. PPP is a viable option to reform water utilities in developing countries
2. Local/Regional PPPs Operators play an increasing role in Water PPPs.
3. Direct Investments from Water PPP's have been less forthcoming than expected.
4. PPPs' main contribution lies in **improving service quality and operational efficiency.**

Looking Forward: (2/3)

5. **Need for more careful design and implementation of contracts**
 1. more realistic targets (including need for credible baseline)
 2. Reducing risk of renegotiations
 3. Both private and public partners must comply with the deal

6. **Successful PPPs, part of Well Designed Sector Reforms**
 1. Sector framework that supports financial viability and accountability
 2. Cost-recovery tariff policy together with transparent subsidies
 3. Sound economic regulation through contracts and /or laws®ulations
 4. Transparency : in granting contracts, in tariff/subsidy design; in enforcement of regulation.

Looking Forward: (3/3)

7. Social considerations needs to be incorporated explicitly in the design of PPP reforms
 1. Cost of social goals must be recognized in policies and contracts
 2. Subsidizing access for the poor must be considered
 3. Separating customers tariffs from remuneration to operators may be an option
 4. Wide range of Impact of PPPs on Labor must better addressed.

Looking Forward: Broadening Scope for Water PPPs

- BOTs for treatment plants: US\$ 1 billion per year
- New contractual approaches are emerging:
 - Performance-based service contracts (PBC) for leakage reduction in Karnataka in India, Ho Chi Minh in Vietnam
 - PBC for commercial management in Burkina Faso
 - Subcontracting: Bogota in Colombia
- Boundaries are getting blurred with public utilities:
 - Going for IPOs in financial markets, or signing contracts outside of their jurisdiction
 - Uganda: the Internally Delegated Area Management Contracts (IDAMC) & TA in region

Merci

www.ppiaf.org