

## Seminar: Financing wastewater treatment and resource recovery



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# ABSTRACT VOLUME

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Water and waste: reduce and reuse

# Seminar: Financing wastewater treatment and resource recovery

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## Business models for resource recovery and reuse in wastewater sector



Presenting Author: Dr. Miriam Otoo, Sri Lanka, International Water Management Institute

Co-Authors: Dr. Pay Drechsel, Sri Lanka, International Water Management Institute

### Highlights

The paper shows that different wastewater reuse related business models have great potential to support the sustainability of wastewater management enterprises, by reducing operational and maintenance (O&M) costs and/or use generated revenues from recovered resources to bridge financial gaps and complement other supporting mechanisms for making wastewater management more attractive.

### Introduction and objectives

There are significant opportunities to generate social benefits from wastewater treatment and also monetize the reuse value in ways that enable public and private sectors to achieve higher degrees of cost recovery or to generate profits for a better delivery of wastewater services. As we make a paradigm shift towards more market-driven options for wastewater management, it is timely to analyze emerging business models for testing and dissemination in the public and private sectors. The presentation will show successful examples of wastewater reuse business models including: water recovery for irrigation, nutrients and energy recovery and carbon credits in developing countries.

### Methodology approach

The conceptual framework was based on an in-depth assessment of empirical wastewater reuse cases to understand factors driving their success and sustainability; and scalability barriers. The assessment drew on data from 25 developing country case studies, together with a broad range of information sources (literature review, key informant and focus group interviews, secondary and primary quantitative data). Using standardized indicators, the cases were assessed based on key criteria that shed light on the financial flows, production factors, resources or capacities requirements, management structure, and economic benefits to help understand the financial sustainability, scalability and development impact potential of the models.

### Analysis and results

1. Social and environmental value can be maximized while targeting cost recovery especially in regions where water is a scarce resource and reclaimed water is of high importance for agriculture as noted in Egypt, Tunisia and Morocco. Some notable cases recovered 50 – 75% of operational costs, although financial cost recovery can be limited given the commonly subsidized freshwater tariffs or free groundwater access.
2. For medium to small-scale community-based wastewater treatment plants (WWTPs), additional value propositions such as the sale of fish fed with fodder grown with the nutrients wastewater offers, can exponentially increase cost recovery potential for WWTPs (e.g. Ghana, Bangladesh and India). RRR to achieve high cost recovery also extends to larger-scale WWTPs through highly efficient energy recovery mechanisms (e.g. Jordan).
3. These successful enterprises of wastewater reuse leverage key partnerships to reduce investment costs and increase access to markets for their outputs. Results also suggest that the structure of business arrangements (i.e. innovative cost sharing models with clear benefit-sharing mechanisms, revenue models, management structure) has significant impacts on overall benefits to the involved

parties. Complex managerial systems of multi-partnerships can result in inefficiencies and higher operational costs when responsibilities of key partnerships are not clearly defined.

### **Conclusions and recommendation**

Market-driven mechanisms are increasingly being adopted in the wastewater sector to catalyze higher degrees of cost recovery or profit generating to better deliver waste management services. Innovative and strategic partnerships have an important role to play in the success of wastewater reuse related business models, although complex managerial systems and unclear benefit-sharing can hinder the sustainability of the partnerships and invariably that of the wastewater reuse enterprise.

# Public-private partnerships for resource recovery and reuse in low-income countries



Presenting Author: Ms. Katharina Felgenhauer, Ghana, International Water Management Institute

Co-Authors: Dr. Josiane Nikiema, Ghana

## Highlights

Public-private partnerships (PPP) can enhance resource recovery and reuse (RRR) but remain challenging to implement.

Practitioners require more skills and capacity to run viable PPP but receive insufficient guidance, especially in low-income settings.

IWMI's analysis of PPP in RRR in Ghana can inform tools to guide PPP practitioners in RRR.

## Introduction and objectives

Resource recovery and reuse (RRR) can help alleviate the wastewater crisis by easing the waste burden and generating additional income. Public-private partnerships (PPP) can enhance RRR capacity and viability but differences in mandate, strategic focus, procedures and interface management complicate partnership building across sectors. Practitioners require better skills and more capacity to run PPP effectively and efficiently but they face a gap in PPP guidance, especially in low-income settings. IWMI seeks to develop recommendations and tools for PPP in RRR, drawing on lessons from first-hand implementation experience in Ghana.

## Methodology approach

IWMI has successfully brokered and implemented PPP in RRR in Ghana. The analysis of these cases exposes success factors and bottlenecks along all stages of PPP management, including partnership brokerage, feasibility assessment, contract management, objectives-oriented planning, business models, financing options, execution, monitoring and evaluation, risk management, and options for being more gender-inclusive. Framework conditions have been screened for pull and push factors as well as barriers to full stakeholders' involvement. The resulting lessons can inform PPP practitioners in RRR and potentially fill gaps in existing PPP guidance and tools.

## Analysis and results

IWMI's reference cases from Ghana demonstrate how PPP in RRR can be set up while addressing skills and capacity gaps. Guidance derived from these cases include:

1. The identification and attraction of suitable partners can be challenging for all sides. Clear strategies and commitments to overcome remaining capacity gaps need to be included in the PPP setup and business planning.
2. Partners need to build capacity across operational and leadership functions to negotiate between sectors. Joint management and supervisory bodies can lower transaction costs.
3. The development of functional cost- and risk-sharing mechanisms requires full cost and benefit transparency between stakeholders. Willingness to cooperate is fundamental but subject to risks over time.
4. Marketing, supply chain development and logistics for RRR products are key components of PPP inception and implementation especially when value chains are weak.
5. New partners and financing mechanisms can bridge funding gaps, especially in upfront investments.

6. Insufficient involvement of and alignment with stakeholders throughout the inception and implementation processes can hinder synergies and put the PPP at risk.

### **Conclusions and recommendation**

There is a need and an opportunity for practical tools for PPP in RRR because existing tools insufficiently respond to the realities of practitioners, especially in low-income settings. Lessons from IWMI's case studies and other examples can be translated into practical recommendations which complement existing PPP tools and address the particular requirements of public and private sector partners in RRR. Such PPP guidance will leverage viable business models for RRR and support investment decisions.

## Using investment guarantees to leverage private sector financing



Presenting Author: Ms. Malinne Blomberg, Cote d'Ivoire, African Development Bank

Co-Authors:

### Highlights

Investment guarantees are used to mitigate risks faced primarily by private players.

Whilst extensively used in sectors like energy, and transport, they are rarely used in water and waste.

This presentation demonstrates how guarantees can be used to bring additional and new financing to RRR infrastructure and services.

### Introduction and objectives

The private sector can bring much needed new funds to RRR efforts, but their potential remains largely untapped, often explained by the socio-political and historically public nature of water and waste. However, the private sector is interested, but finds investments risky, and beneficiaries' affordability constraints makes it difficult to balance the risk and reward of investments.

Investment guarantees are products designed to mitigate risk to make investments feasible. They are extensively used in sectors like energy, and transport, yet hardly used in water and waste. This presentation demonstrates how investment guarantees can be used to foster additional financing.

### Methodology approach

Establishment of high-level overall volumetric demand, the consequential demand for funding, the challenges to private sector participation, the history of PSP in Africa and the reasons why existing guarantee instruments are not being used. This was followed by assessing the potential realistic demand for guarantees and how this can be promoted and by whom. The assignment concludes with a feasibility study of the proposed instruments and recommendations on operationalisation. The study is based on primary and secondary information sources. Hypotheses and recommendations were tested with private sector stakeholders for relevance and underwent a peer review by the AfDB.

### Analysis and results

A multi-pronged approach involving multiple investment facilitation actions will effectively support private investment.

1. Policy and sector reform to ensure realistic political decisions regarding tariffs and subsidisation policies, determining the ability to service loans or to generate acceptable returns on investment. A policy environment that reconciles the conflicting goals of providing safe and affordable water, while ensuring a commercially viable system is needed;
2. Tailoring existing Partial Risk Guarantee (PRG) product to create a specific water and sanitation guarantee. This will mitigate the main cause for market failure and limited engagement by the private sector, which is loss due to the failure of governments to set tariffs at cost recovery level, or the failure to provide subsidies for long term creditworthiness;
3. Marketing and brokerage functions to make private and public sector operators, financial institutions and other W&S stakeholders aware of the potential and how to build risk mitigation products into projects;

4. Development of a pipeline of bankable projects, including the use of blended finance. When the transaction volume has increased, a specific investment guarantee facility may be set up for water and waste;

Concrete suggestions will be provided for all of the above.

### **Conclusions and recommendation**

Through a multi-pronged approach, and collaboration amongst stakeholders, a pipeline of water and waste projects that use guarantees will be built and investment funds mobilised from the private sector, oftentimes blended with public funds. In Africa it is estimated such investments can be ramped up from about \$250 million/year over the next two years, to the range of \$6billion/year in about 10 years. A large portion of this will be for RRR.