HOW TO ACHIEVE SUSTAINABILITY IN IRRIGATION SCHEMES WITH PRIVATE SECTOR PARTICIPATION

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October 15, 2015
ICID Irrigation PPP conference, Montpellier
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II. Irrigation PPP Toolkit
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I.1. Growing investment needs in irrigation

• High and increasing construction costs and poor production performance
• Negative environmental impacts
• Conflicted role of governments w.r.t. irrigation
• Scarcity of local budgets
• Lack of technical expertise and capacity for
  – Designing and building systems
  – Efficient operation and maintenance
  – Innovation and creativity in supplying to the changing demand
• Low water charge and poor recovery rates
• Poor collection rates
I.2. Resulting in...

- Stagnation of existing infrastructure
  - Increase in water losses
  - Increase in maintenance costs
- New systems completely dependent on grant funding
- Negative impact on crop yields and quality
- Government paying for both capital costs and O&M expenses
  - Water tariffs not enough even for irrigation O&M

...lack of performance and self-sustainability of irrigation systems
I.3. What is needed?

- How can the system be designed in a sustainable manner?
  - Not only from engineering & environmental perspective but also functional over long term
  - Linking production to capital investment

- Develop a framework which would transcend from one implementation arrangement to the next
  - Institute appropriate contractual and institutional arrangements
  - Incentive and results-based instead of input-based

- How to ensure “market” is prepared to invest in long term assets for irrigation and agriculture
I.4. Need to combine public and private resources more efficiently

- Government support is needed
  - But in what part of irrigation? How?
- Make the project ‘viable’?
  - For farmers and other users
  - For the government
  - For private sector
- Need to view Irrigation as a “business”
  - Shift from a public good to a social good
  - Delivery by private and benefit transfer
- Develop a better understanding of private sector involvement in irrigation
  - Can the private sector deliver better service?
I.5. Private investment in water sector by region

Private investments in water sector

Source: PPI database, World Bank Group
I.6. ....water is a small part of overall private investment

- Total private investment in infrastructure in energy, transport, and water and sanitation sectors increased 6% to US$107.5 billion in 2014
- Five countries accounted for 73% of total investment and 63% of all projects

Source: PPI Database, World Bank Group
I.9. Motivation for private sector participation (PSP) in irrigation is same as any other infrastructure

- Government will be able to use its resources more efficiently if the private sector can:
  - Bring financing support
  - Share risks
  - Bring technical expertise for better service
  - Enhance transparency
  - Bring sustainability over life

Value for Money (VfM) for government
I.10. What is a Public-Private Partnership (PPP)?

• “A long-term contractual arrangement between a public entity or authority and a private entity for providing a public asset or service in which the private party bears significant risk and management responsibility.”

I.11. Each phase of infrastructure project has challenges
II.1 Toolkit overview

• **Objective**
  - to provide governments, public authorities and other interested stakeholders with a practical guide on how to design and tender sustainable PPP arrangements in the irrigation sector

• **Value added**
  - its systematic, project-based focus on how to prepare, structure, and implement a PPP project specific to irrigation
II.2. Structure of the toolkit...in draft

Your comments and feedback welcome!
II.3. Approach based on case studies

![Chart showing PPPs in irrigation case study analysis (n=29)]

- Western Europe and Australia
- Latin America and Caribbean
- Eastern Europe and Central Asia
- Sub-Saharan Africa
- South and East Asia
- Middle East and North America
II.4. Comparison of selected case studies

<table>
<thead>
<tr>
<th>Underlying features</th>
<th>Guerdane Morocco</th>
<th>Goulburn-Murray Australia</th>
<th>Olmos Peru</th>
<th>Megech-Seraba Ethiopia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Costs</td>
<td>$85 million</td>
<td>$2.1 billion</td>
<td>$590 million</td>
<td>$47 million</td>
</tr>
<tr>
<td>Farmer experience</td>
<td>Established</td>
<td>Established</td>
<td>Established</td>
<td>Limited</td>
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<tr>
<td>Farming activity</td>
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<td>Mixed</td>
<td>Subsistence</td>
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<td>Size and scope</td>
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<td>900,000 ha</td>
<td>43,500 ha</td>
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<td>Designed feature</td>
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<tr>
<td>Project preparation</td>
<td>Design Build</td>
<td>OMM</td>
<td>Concession</td>
<td>Public finance w/</td>
</tr>
<tr>
<td>and sponsorship</td>
<td>Operate</td>
<td></td>
<td></td>
<td>private OMM</td>
</tr>
<tr>
<td>Farming model/plan</td>
<td>None</td>
<td>Design and Build (public), distribution (private)</td>
<td>None</td>
<td>Set up of Water Users Associations</td>
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<tr>
<td>Farmer participation</td>
<td>Off taker</td>
<td>Off taker</td>
<td>Off taker</td>
<td>Via WUAs &amp; KPIs</td>
</tr>
<tr>
<td>Financing</td>
<td>Public private</td>
<td>Public private</td>
<td>Public private Irrigation (private)</td>
<td>Public via IDA credit</td>
</tr>
</tbody>
</table>
III.1. Enabling environment first step towards sustainability

- **Regulation on private sector’s role in irrigation**
  - Appropriate legal framework e.g. Brazil
  - Impact on public budget, tax and subsidy
  - Priorities in water use, storage and conservation
  - Needs to be aligned with overall PPP policy framework and integrated with local policies

- **Example**
  - India, State of Uttar Pradesh has enacted Water Resources Regulatory Authority/Commission Act
  - Regulating water as a resource, assuring judicious, equitable and sustainable management,
  - Allocating and optimal utilization of water for environmental, agriculture, industrial, power, flood protection, and drinking purposes
  - Ethiopia, policy to set up WUAs and their role in OMM
III.2a. Emphasis on project preparation

• **Total Asset Management Planning**
  – Life cycle costs
  – Agricultural value chain

• **Project preparation to ensure**
  – Technically viability
  – Economically viability
  – Legal viability
  – Institutional viability
  – Financially viability
  – Affordability
III.2b. Financial viability generally not part of decision process

- Irrigation schemes are self-contained and completely dependent on viability of the agricultural activity
  - Only agricultural production activity (or off take) creates economic value
  - Access to markets
  - Incentives to improve inputs

- Project viability is dependent both on the level and reliability of the revenues (i.e. Price X Quantity = Revenues)
  - Limited flexibility in adjusting the irrigation tariff
  - Water demand is uncertain, more so if users have to pay
  - Thus, payment risk becomes the most critical

- **Can Government support mitigate payment risk?**
  - Direct and indirect

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*Financial viability = repayment of debt and equity given the country/project risk*
III.2c. Typology of government support

• **Subsidy (direct)**
  – Upfront payment for capex
  – Over lifetime for opex
  – Periodic payments in support of operational revenues (Use of availability payment)
  – Output-based payments linked to crop yield or some other performance measure

• **Indirect**
  – Policy and regulatory e.g. tariff adjustment, enforcement of illegal usage, social issues
  – Contingent support e.g early termination payments, f/x coverage, change in law, licenses

• **Support to lenders on security packages**
  – Whether assets, tangible and intangible can be pledged
  – Use of government funds as possible collateral
III.3a. Understanding the risks and optimal risk transfer

- **Demand**
  - Off-take, hydrology
  - Collection (from users)
  - Payment (from users)
  - Social-political profile

- **Financing risk**
  - Debt service, F/X as revenues are in local currency, security package

- **Construction risk**
  - Delays and overruns

- **Commercial risk**
  - Land rights/allocations/power supply

- **Force majeure**
  - Natural or political

- **Regulatory**
  - Tariff adjustment

- **Operational risk**
  - Performance
  - Linkage to agri-business?

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*Important to understand risks to better allocate them to achieve better Value for Money and create a sustainable scheme*
### III.3b. Preferences on risk allocation

- Macro, legal and regulatory level risks generally taken by public
- Construction, financial and project level risks are usually allocated to the private sector

<table>
<thead>
<tr>
<th>Type</th>
<th>U.K.</th>
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<th>Hong Kong</th>
<th>Greece</th>
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<td>56</td>
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<tr>
<td>Legal</td>
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<td>51</td>
<td>31</td>
<td>35</td>
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<td>Change in tax regulation</td>
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<td>Regulation</td>
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<td>Land acquisition</td>
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<tr>
<td>Regulation</td>
<td>35</td>
<td>32</td>
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<td>60</td>
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<tr>
<td>Delay in project approvals and permits</td>
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<tr>
<td>Construction</td>
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<td>Construction</td>
<td>33</td>
<td>26</td>
<td>41</td>
<td>6</td>
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<tr>
<td>Excessive contract variation</td>
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<td>Availability of finance</td>
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</tbody>
</table>

### III.3c. Risk matrix in selected case studies

<table>
<thead>
<tr>
<th></th>
<th>Guerdane Morocco</th>
<th>Goulburn-Murray Australia</th>
<th>Olmos Peru</th>
<th>Megech-Seraba Ethiopia</th>
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</thead>
<tbody>
<tr>
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<td>Developer</td>
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<td>Developer</td>
<td>Public</td>
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<td><strong>Financing</strong></td>
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<td>- Debt service</td>
<td>- Developer</td>
<td>- Public</td>
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<td>- Public</td>
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<td>- Foreign Exchange</td>
<td>- Shared</td>
<td>- Public</td>
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<td>- Public</td>
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<tr>
<td><strong>Construction</strong></td>
<td>Developer</td>
<td>Public</td>
<td>Developer</td>
<td>Public</td>
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<td><strong>Operational</strong></td>
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<tr>
<td>- Design</td>
<td>- Developer</td>
<td>- Public</td>
<td>- Developer</td>
<td>- Public</td>
</tr>
<tr>
<td>- Handover</td>
<td>- Public</td>
<td>- Public</td>
<td>- Public</td>
<td>- Shared</td>
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<tr>
<td>- O&amp;M</td>
<td>- Developer</td>
<td>- Operator</td>
<td>- Operator</td>
<td>- Operator</td>
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<tr>
<td><strong>Commercial</strong></td>
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<td></td>
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<td>- Service coverage</td>
<td>- Developer</td>
<td>- Operator</td>
<td>- Operator</td>
<td>- Operator (KPIs)</td>
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<td>- Land</td>
<td>- Farmers</td>
<td>- Farmers</td>
<td>- Farmers</td>
<td>- Farmers</td>
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<tr>
<td>- Power</td>
<td>- Developer</td>
<td>- Operator</td>
<td>- Operator</td>
<td>- Public</td>
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<td><strong>Force Majeure</strong></td>
<td>Shared</td>
<td>Shared</td>
<td>Shared</td>
<td>Public</td>
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<td>Nature (Drought)</td>
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<tr>
<td><strong>Public obligations</strong></td>
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<td></td>
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<tr>
<td>- Govt payments</td>
<td>-Yes</td>
<td>-Yes</td>
<td>-Yes</td>
<td>-Yes</td>
</tr>
<tr>
<td>- Tariff adjustments</td>
<td>- Developer</td>
<td>- Operator (bidding criteria)</td>
<td>- Developer</td>
<td>- Public</td>
</tr>
</tbody>
</table>
III.4. Third party participation brings sustainability

- WUAs with transfer of OMM services (59%)
- Forms of involvement: development, design, building, financing, supply and service provision, market access, fee collection, equipment supply
- Benefits
  - Positive outcome with efficient and quality service
  - Filling gaps where government is at a disadvantage
  - Decreased transaction costs
III.5. Long term contractual relationship is needed

- Contract to provide clarity and certainty, while giving room for flexibility
- Some clauses standard, while others are not
- **Key areas:**
  - Definitions
  - Type of PPP
  - Duration
  - Risk identification, allocation
  - Early termination
  - KPIs
  - Party obligations
  - Tariffs
  - Monitoring & reporting
  - Dispute resolution
  - Force Majeure

- **Average number of years in cases**
  - Concession 25 years
  - Operation and maintenance 7.5 years
  - Lease 15 years
III.6a. Contract management is often missing

- Definition of partnership between public and private
- Roles and responsibilities
- Administration of PPP
- Project management
- Takes place during both construction and service delivery
- Contract monitoring starts as soon as the project is awarded to the private sector
III.6b. Role of performance indicators

- **KPIs to track project progress and performance**
  - Irrigation efficiency
  - Collection
  - Creation and training of WUAs
  - Staffing and labor
  - Registration of users
  - Accessibility

- **Progressive KPIs**
  - E.g. Megech-Seraba OMM contract

- **Irrespective of public/pvt service provider**
  - E.g. Nilo Coelho Brazil
III.7a. Public sector has many roles

Traditional procurement (all public)
- Policy development and planning
- Regulation enforcement
- Water rights administration
- Granting authority
- Design and building irrigation schemes
- Financing irrigation schemes
- Setting tariff and collection
- Asset ownership
- Administration, operation and maintenance of irrigation system with participation of users
- Ensuring water security
- Performance monitoring and project implementation oversight

PPP arrangement (Public and private)
- Policy development and planning
- Regulation enforcement
- Water rights administration
- Granting authority
- Design and building irrigation schemes (Private)
- Financing irrigation schemes (Private)
- Setting tariff
- Collection of fees (Private)
- Asset ownership
- Administration, operation and maintenance of irrigation system with participation of users (Private)
- Ensuring water security
- Performance monitoring and project implementation oversight

Government is reducing its involvement and thus is reducing the fiscal responsibility
III.7b. Need to simplify the roles....

Maximum risk transfer to achieve just enough bankability
III.8. Affordability has different meanings

Public sector’s perspective
Government can afford the level of expenditure required to support the implementation of the scheme on a sustainable basis.

Farmers’ perspective
Farmers’ level of income post-implementation of the PPP scheme is higher than pre-implementation, taking in account any required increase in water user charges.

Private sector’s perspective
User fees and government payments are large enough to help Pvt Sector recover any capital and O&M costs that Private Sector expect to face as part of the proposed PPP arrangements charges.
IV.1. Need to develop a solution that brings about ...

- Better use of Government resources to bring the right framework, expertise and financing to achieve self-viability and sustainability
  - Irrespective of whether it is public or PPP scheme

**Right framework**
- Smooth transition from one implementation arrangement to the next
- Institute appropriate contractual and institutional arrangements
- Creates incentives for performance and efficiency

**Right expertise**
- Design schemes in a sustainable manner
- Not only from engineering & environmental perspective but also from O&M
- Link capital investment to crop production levels

**Right financing**
- Incentive and results-based instead of input-based
- Self-sufficient to operate by itself
- Bears life cycle costs
- Lowest cost and highest revenues for all stakeholders
IV.2. Way forward

• **Long term perspective and consistency**
  - Rethink role of the State
    - Decentralization, integration with value chains
    - Role of SOEs

• **Need to use public resources more efficiently**
  - Current ‘single’ mechanism for public money is inefficient (avoid economic and market distortions)

• **Unlike in other sectors, the role of PPP remains limited in the case of irrigation projects**
  - Strong evidence to show 3rd party involvement improves quality and efficiency of service

• **Hybrid approaches**
  - Greenfield e.g. design, supervision and OMM or EPC plus OMM till ramp up

• **Build capacity at institution level**
  - Minimum level of knowledge of structuring and contract management
  - One solution is to train in PPPs
Are you a CP³P?

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