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How to achieve sustainability in irrigation schemes with private sector participation

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Contents

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?

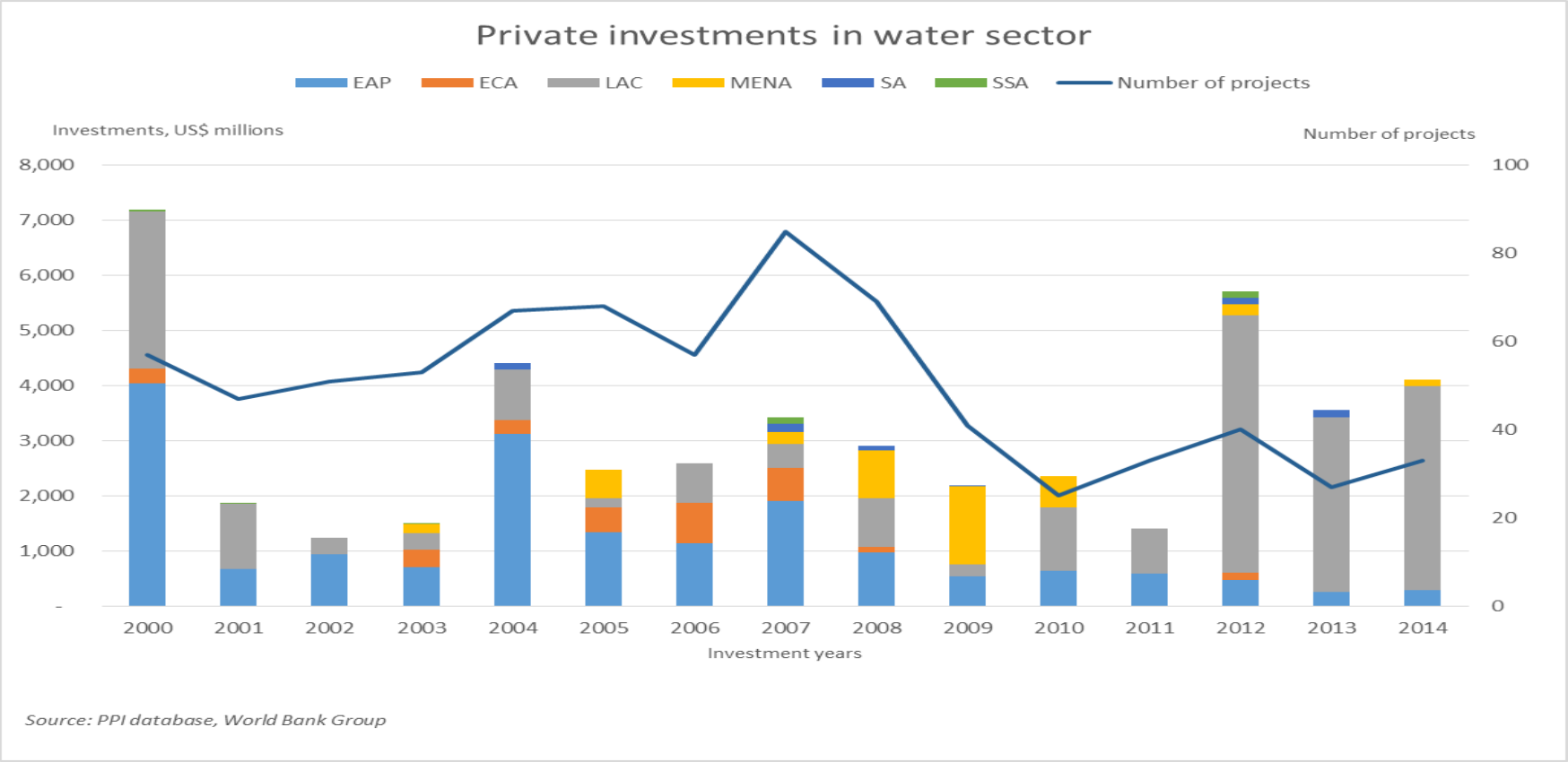
- How can the system be designed in a sustainable manner?
  - Not only from engineering & environmental perspective but also functional over long term
  - Linking production to capital investment
- Develop a framework which would transcend from one implementation arrangement to the next
  - Institute 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?

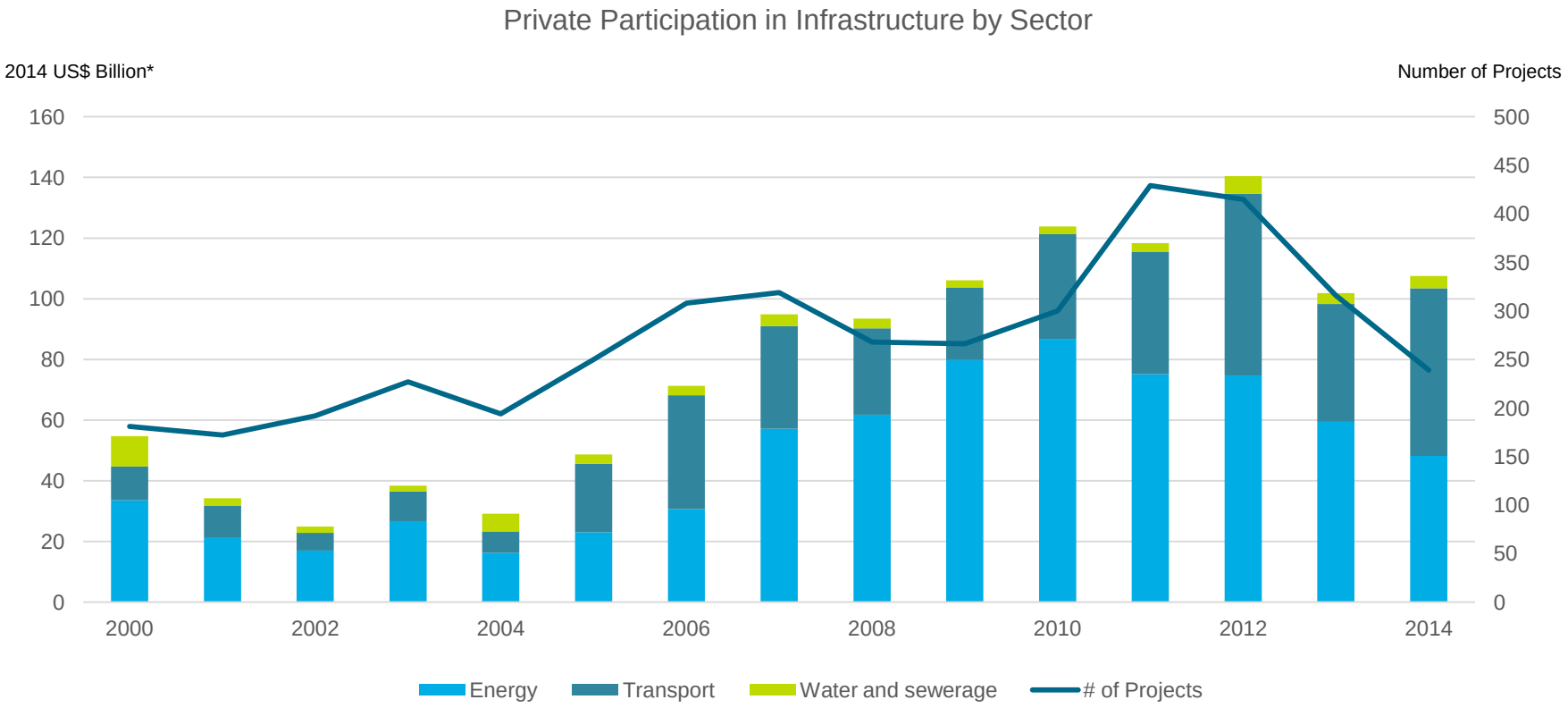
I.5. Private investment in water sector by region



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

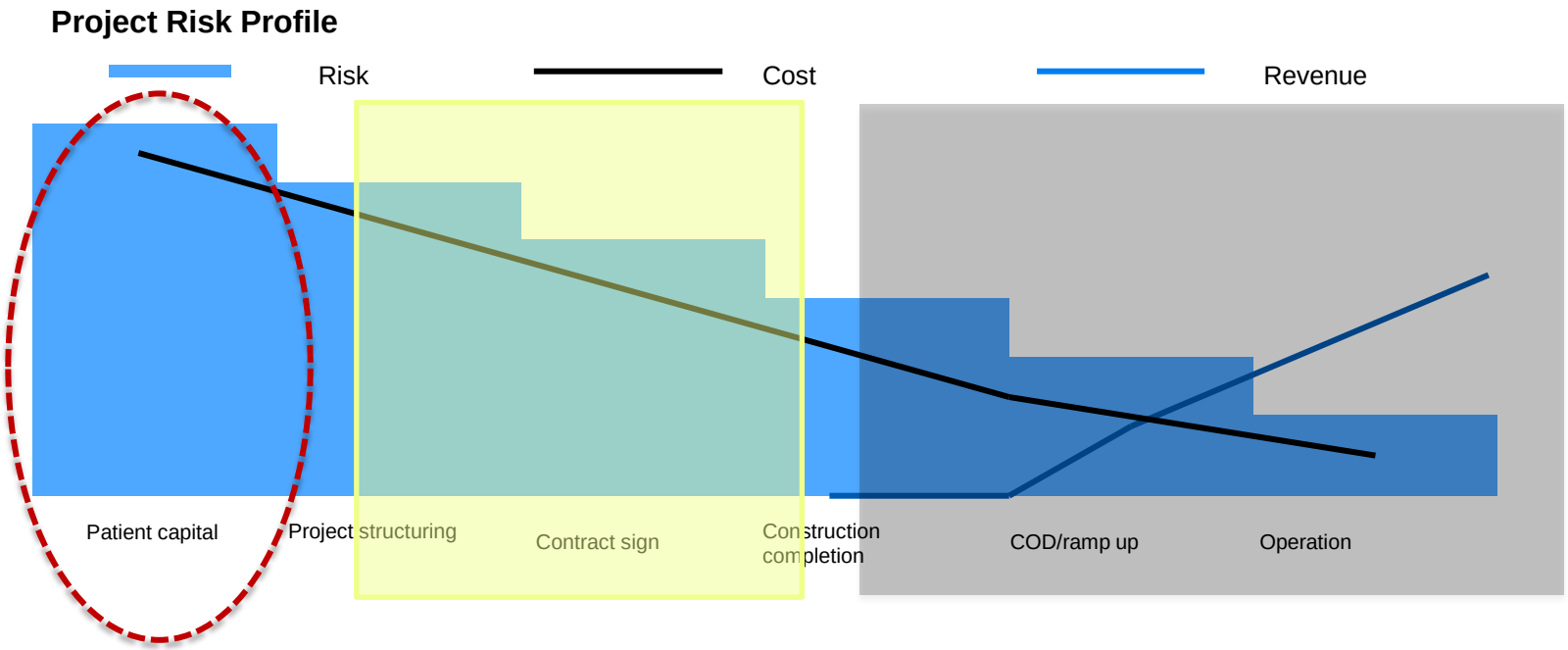
- Government will be able to use its resources more efficiently if the private sector can:
  - Bring financing support
  - Share risks
  - Bring technical expertise for better service
  - Enhance transparency
  - Bring sustainability over life

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."***
  - http://www.worldbank.org/en/topic/publicprivatepartnerships

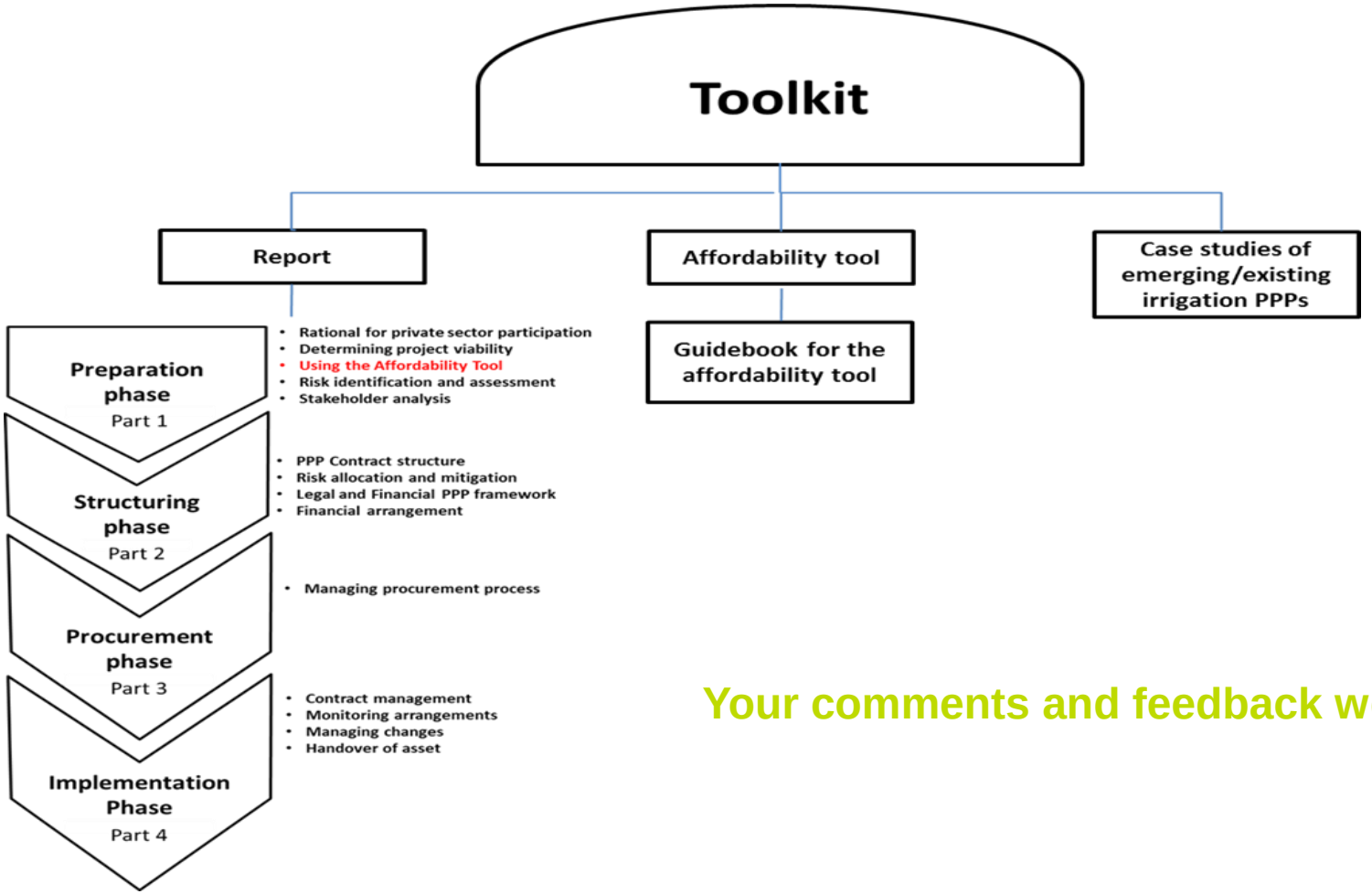
I.11. Each phase of infrastructure project has challenges



II.1 Toolkit overview

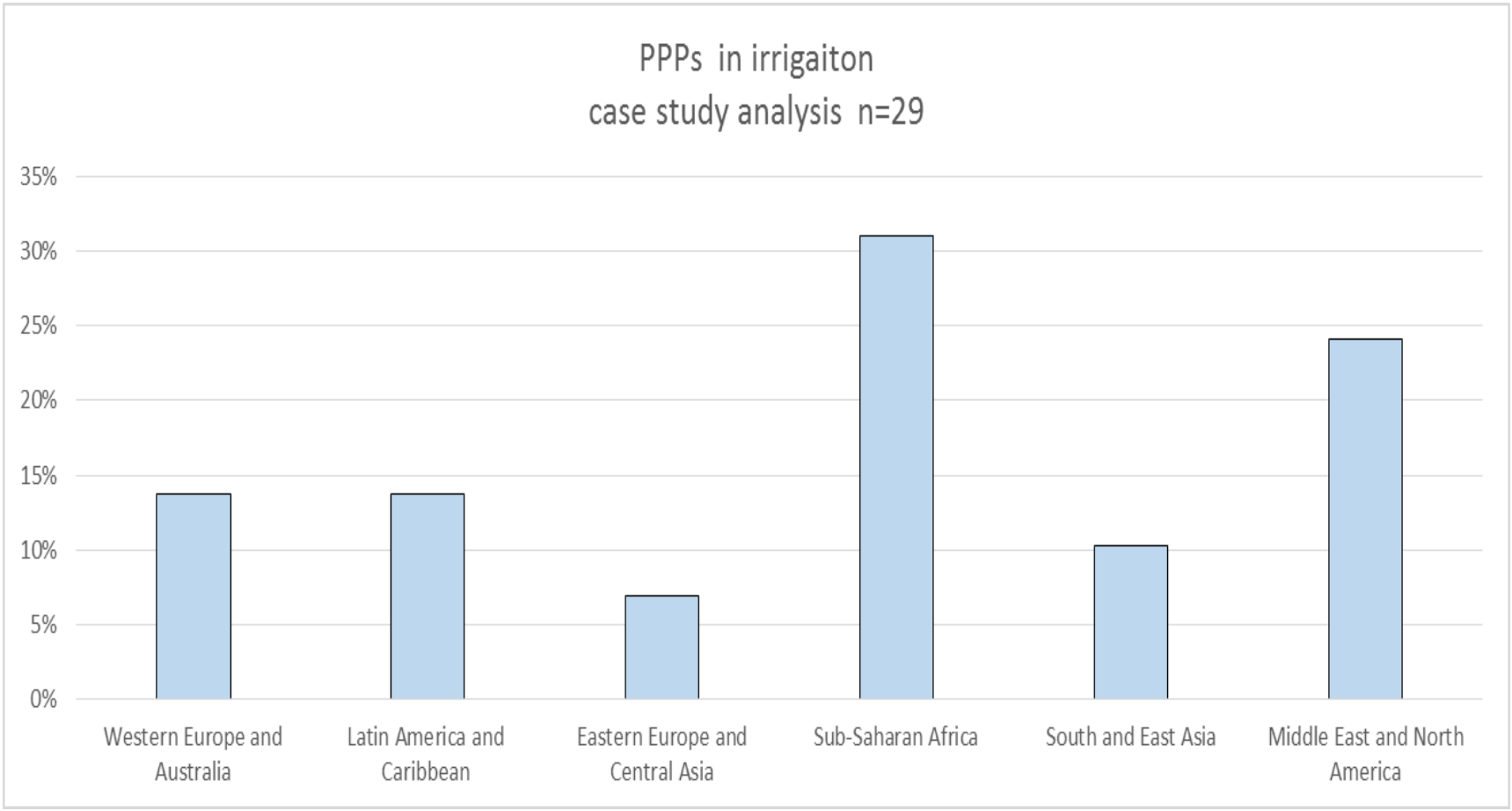
- Objective
  - to provide governments, public authorities and other interested stakeholders with a practical guide on how to design and tender sustainable PPP arrangements in the irrigation sector
- Value added
  - its systematic, project-based focus on how to prepare, structure, and implement a PPP project specific to irrigation

II.2. Structure of the toolkit…in draft



Your comments and feedback welcome!

II.3. Approach based on case studies



II.4. Comparison of selected case studies

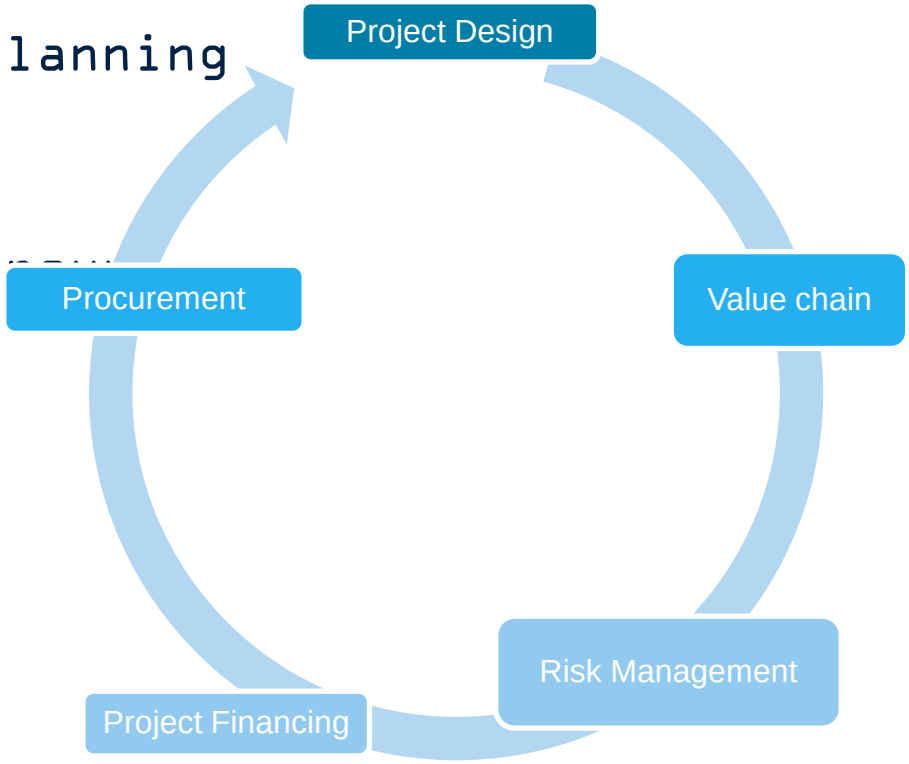
Underlying features	Guerdane Morocco	Goulburn-Murray Australia	Olmos Peru	Megech-Seraba Ethiopia
Costs	$85 million	$2.1 billion	$590 million	$47 million
Farmer experience	Established	Established	Established	Limited
Farming activity	Cash-crops	Mixed	Mixed	Subsistence
Size and scope	Up to 10,000 ha	900,000 ha	43,500 ha	4,040 ha
Designed feature				
Project preparation and sponsorship	Design Build Operate	OMM	Concession	Public finance w/ private OMM
Farming model/plan	None	Design and Build (public), distribution (private)	None	Set up of Water Users Associations
Farmer participation	Off taker	Off taker	Off taker	Via WUAs & KPIs
Financing	Public private	Public private	Public private Irrigation (private)	Public via IDA credit

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 e
  - 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

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?

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

Public risk Shared risk Private risk

		U.K.			China			Hong Kong			Greece		
Type	Risks	Pub.	Prv.	Shr.	Pub.	Prv.	Shr.	Pub.	Prt.	Shr.	Pub.	Prt.	Shr.
Legal	Legislation change	17	22	61	56	33	22	77	7	16	67	29	4
Legal	Change in tax regulation	18	51	31	35	35	30	56	28	16	76	4	20
Regulation	Land acquisition	61	12	27	39	24	37	63	17	20	55	16	29
Regulation	Delay in project approvals and permits	35	32	33	60	21	19	48	23	29	56	0	44
Construction	Late design changes	26	53	21	12	49	39	19	44	37	4	76	20
Construction	Excessive contract variation	33	26	41	6	19	75	13	35	52	0	92	8
Project finance	Availability of finance	0	85	15	2	64	34	9	70	21	28	20	52

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

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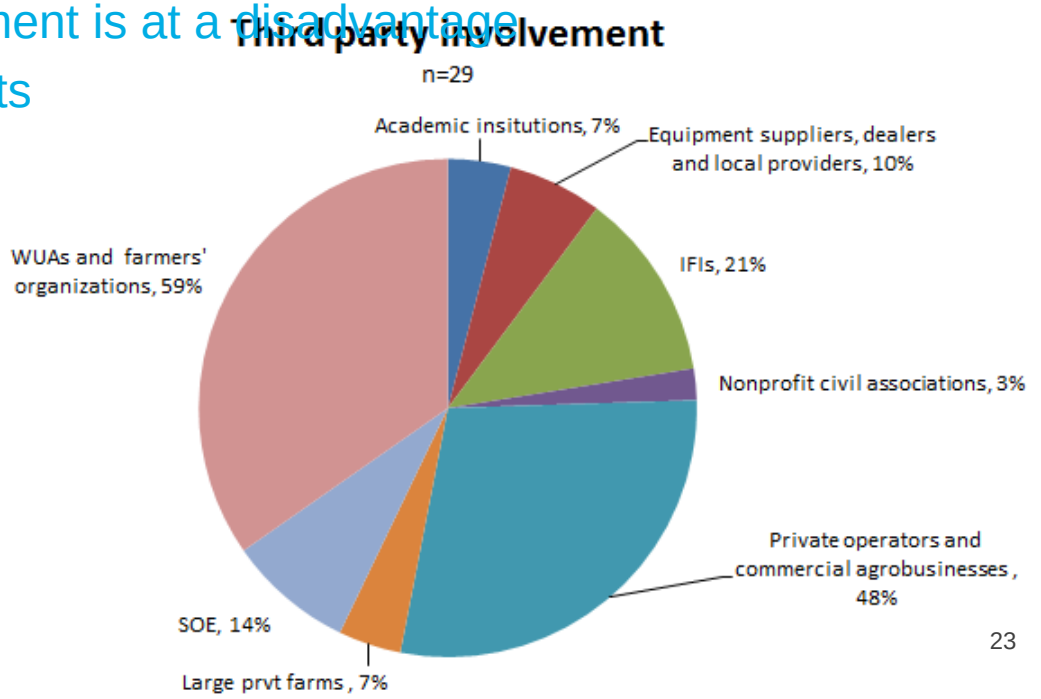
Source: Ke, Yongjian, ShouQing Wang, and Albert PC Chan. "Risk allocation in public-private partnership infrastructure projects: comparative study." *Journal of Infrastructure Systems* 16.4 (2010): 343-351.

III.3c. Risk matrix in selected case studies

	Guerdane Morocco	Goulburn-Murray Australia	Olmos Peru	Megech-Seraba Ethiopia
Demand	Developer	Public	Developer	Public
Financing - Debt service - Foreign Exchange	 - Developer - Shared	 - Public - Public	 - Developer - Shared	 - Public - Public
Construction	Developer	Public	Developer	Public
Operational - Design - Handover - O&M	 - Developer - Public - Developer	 - Public - Public - Operator	 - Developer - Public - Operator	 - Public - Shared - Operator
Commercial - Service coverage - Land - Power	 - Developer - Farmers - Developer	 - Operator - Farmers - Operator	 - Operator - Farmers - Operator	 - Operator (KPIs) - Farmers - Public
Force Majeure Nature (Drought)	Shared	Shared	Shared	Public
Public obligations - Govt payments - Tariff adjustments	 -Yes - Developer (bidding criteria)	 -Yes - Operator (bidding criteria)	 -Yes - Developer	 -Yes - Public

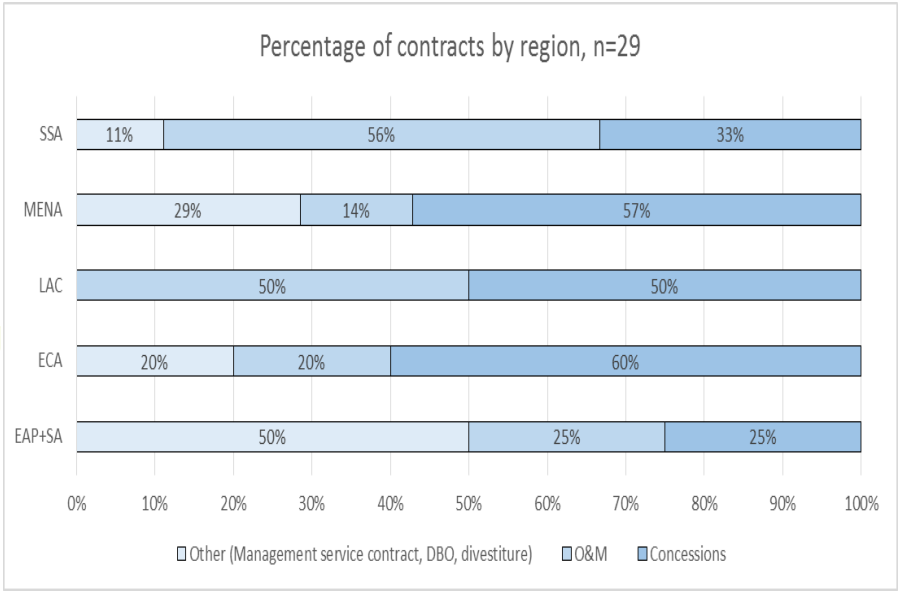
III.4. Third party participation brings sustainability

- 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

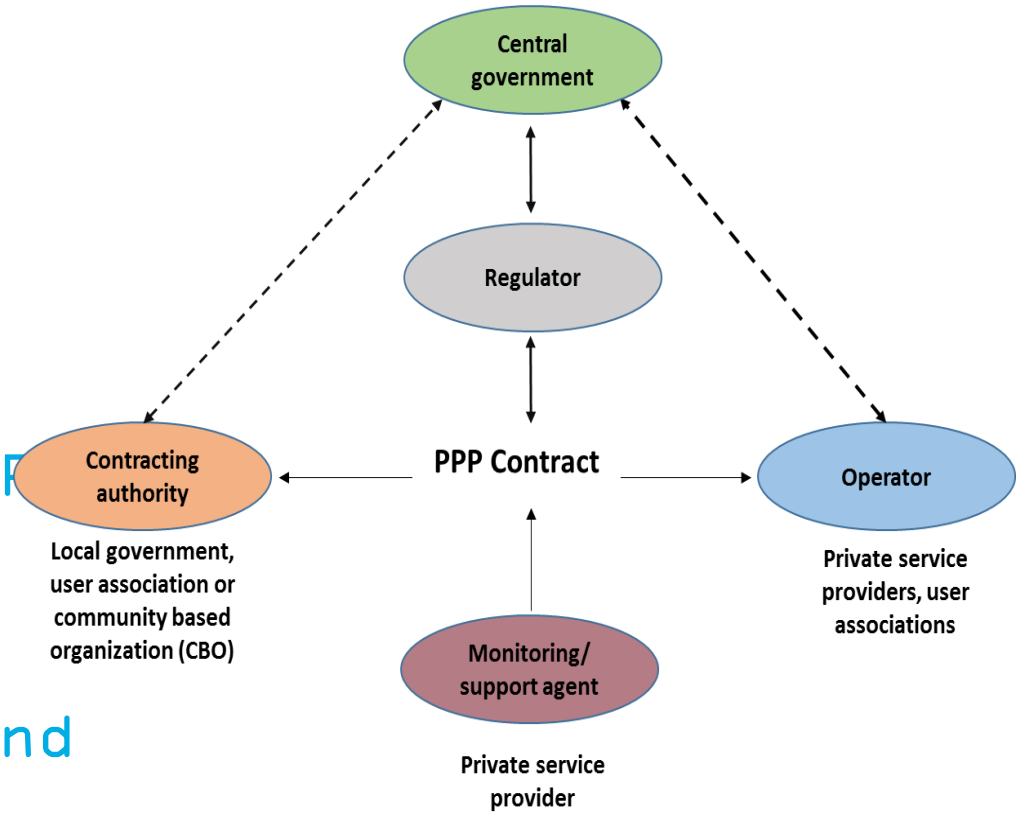
- Contract to provide clarity and certainty, while giving room for flexibility
- Some clauses standard, while others are not
- Key areas:
  - Definitions
  - Type of PPP
  - Duration
  - Risk identification, allocation
  - Early termination
  - KPIs
  - Party obligations
  - Tariffs
  - Monitoring &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



- Average number of years in cases
  - Concession 25 years
  - Operation and maintenance 7.5 years
  - Lease 15 years

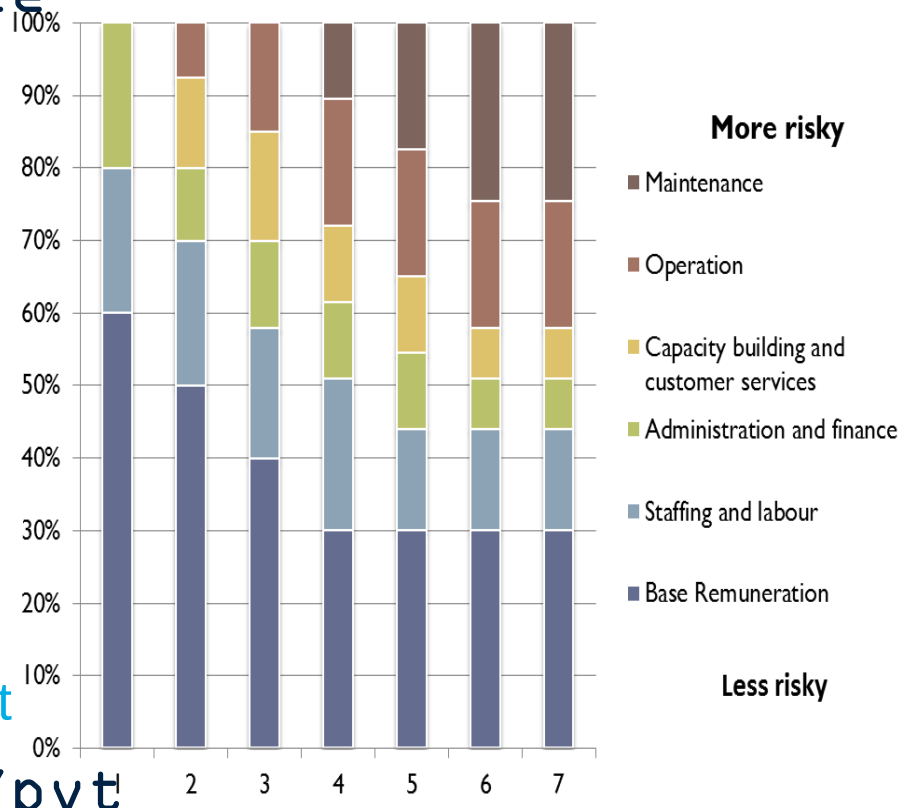
III.6a. Contract management is often missing

- Definition of partnership between public and private
- Roles and responsibilities
- Administration of PP
- 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 e.g.
  - 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)

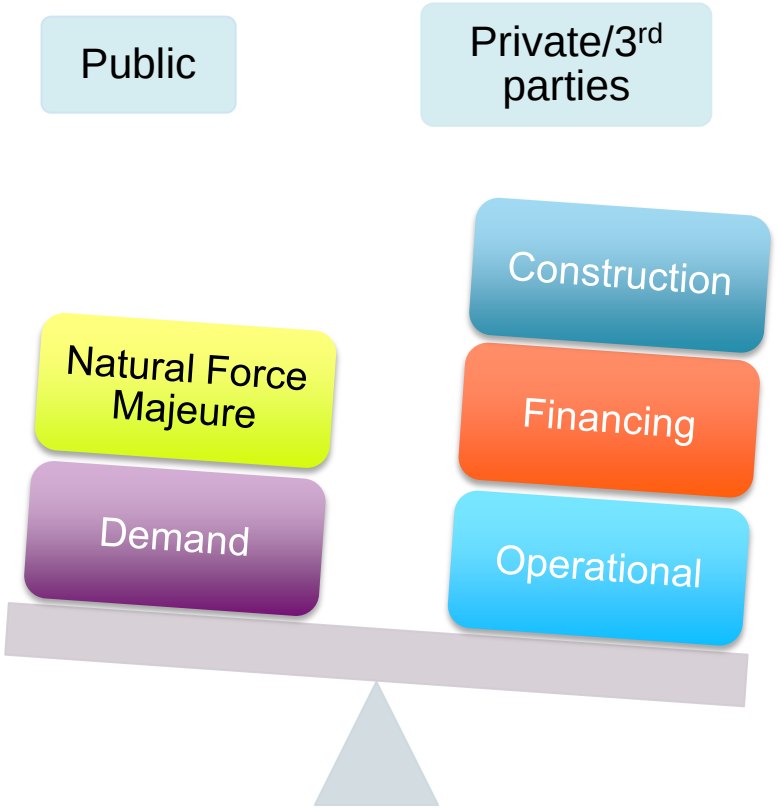
- Policy development and planning
- Regulation enforcement
- Water rights administration
- Granting authority
- Design and building irrigation schemes
- Financing irrigation schemes
- Setting tariff and collection
- Asset ownership
- Administration, operation and maintenance of irrigation system with 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 →

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