



WaterNet short course

Financing of Water Infrastructure projects

IWRM synopsis and water infrastructure

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Structure of presentation

- Sustainable development & IWRM
- The water sector: infrastructure, service providers, users and managers
- Water tariffs
- Water Accounting
- Transboundary water resource management
- Climate change

IWRM for water infrastructure financing

- IWRM:
 - Balancing supply and demand intervention and infrastructure
 - Water use efficiency
 - Management principles:
 - Environment:
 - Water-specific IWRM.
- Key issues:
 - Type of infrastructure & prioritization
 - Water values, pricing & investments
 - Access and affordability (SDGs)
 - Roles of various institutions-stakeholders

Environmental/ SD principles

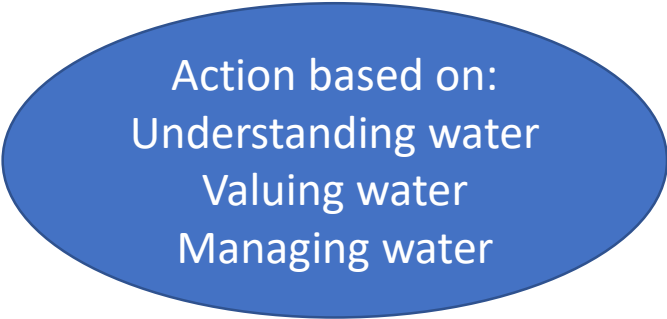
- Maintaining ecosystem functions:
 - Provisioning: production & direct use
 - Regulation: absorption of pollution, flood control
 - Support: climate & disease control
 - Cultural: incl. religion, tourism
- User-pays-principle
- Polluter-pays-principle
- Precautionary principle,

Dublin IWRM Principles (modified)

- Water resources are an:
 - *Environmental good*: finite and can be polluted
 - *Economic good*: scarce with value & price
 - *Social good*: basic need and access needs to be affordable
- Participation of all stakeholders in WRM is needed;
- Women need to fully participate in water resource management
- WRM needs to be decentralised to the lowest feasible level

Bellagio/HLPW principles on valuing water

- Consider the multiple values of water to different stakeholders
- Reconcile trade-offs between different, multiple, values in an equitable, transparent and inclusive manner
- Value and protect all water sources, including watersheds, rivers, aquifers and associated ecosystems for current & future generations
- Promote education & awareness about the essential role of water and its intrinsic value
- **Increase investments in institutions, infrastructure, information and innovation to realise the full potential of water**
- *Source: High Level Panel on Water (HLPW).*



Action based on:
Understanding water
Valuing water
Managing water

IWRM & Sustainable Development

- IWRM is sustainable development (SD) applied to the water sector
- Four SD pillars:
 - Environmental: ecosystem services
 - Social: access, equity, poverty
 - Economic: productivity, water losses
 - Governance: water sector reforms
- SD characteristics:
 - Multidisciplinary: engineers, sociologists, economist, environmentalists etc.
 - Multisectoral: : Agriculture, mining, industry, energy etc.
 - Intertemporal: : current & future generations; NDPs and Long term Visions
 - Multi spatial : from local to transboundary and global

IWRM & SD

- Examples:
 - *Multidisciplinary*: integrating environmental and social costs and benefits in economic analysis
 - *Multisectoral*: water-food and electricity nexus
 - *Intertemporal*: current and future generations' needs
 - *Multispatial levels*: TWM, decentralised WRM, Community based NRM
- IWRM closely linked to SDG6:
 - “Ensure availability and sustainable management of water and sanitation for all”

Water infrastructure

- Managing variability:
 - Resources – safe yields
 - Financial: water losses & water restrictions

- Water infrastructure:
 - Surface water: dams,
 - Groundwater: boreholes and wellfields
 - Water transfer schemes
 - Water treatment plants (fresh water and sewerage)



Water providers

Is there a trade off
between water
conservation &
financial
sustainability of WSP?

- Water service providers: abstract water and distribute it to end-users.
 - Often (semi-)government institutions:
 - Some are responsible for water infrastructure development; others are not
 - Providers of bulk water and of water to end users
 - Monopolies or oligopolies:
 - With or without water regulator
 - With or without required government approval of tariffs
 - Efficiencies ?? (IB-NET)
- Self providers: abstract water for their own use.
 - Pay for own infrastructure and operational costs
 - Common self providers: mines, livestock farmers, irrigation schemes.

How high is
Unaccounted for Water
in you country?

Water users

- Distributed water:
 - Municipalities that distribute bulk water to end users
 - End user: Households and economic sectors

Goal: Reliable,
sustainable, affordable
& safe water supply for
domestic and
productive use

What is affordable for
households?
What is affordable for
irrigation?

Water resource managers

- Water resource planners
- Water infrastructure developers
- Water resource management:
 - Policies & legislation
 - Regulation & regulators

Who is involved? Role of communities & private sector

Water infrastructure is a long term investment with perceived high risks and modest financial returns

Who pays and for what?

Key to water infrastructure investments is to increase the safe yields of the infrastructure system, & ensuring access to water for households & production

What are priority areas for water investments?

Water use pricing: cost recovery?

- Affordability and physical access:
 - Access: SDG: access to safe potable water
 - Affordability standard; e.g. maximum of 5% of monthly disposable income
- Types of costs:
 - Capital & O&M expenditures: public or private good
 - Concepts: average and marginal
 - Opportunity costs (beyond financial costs): includes externalities and foregone future costs (e.g. user and polluter pays principles).
- Pricing methods:
 - fixed monthly charge: irrespective of used amount
 - Unit charge
 - Block tariff

Are water infrastructure and distributed water public and/ or private goods?

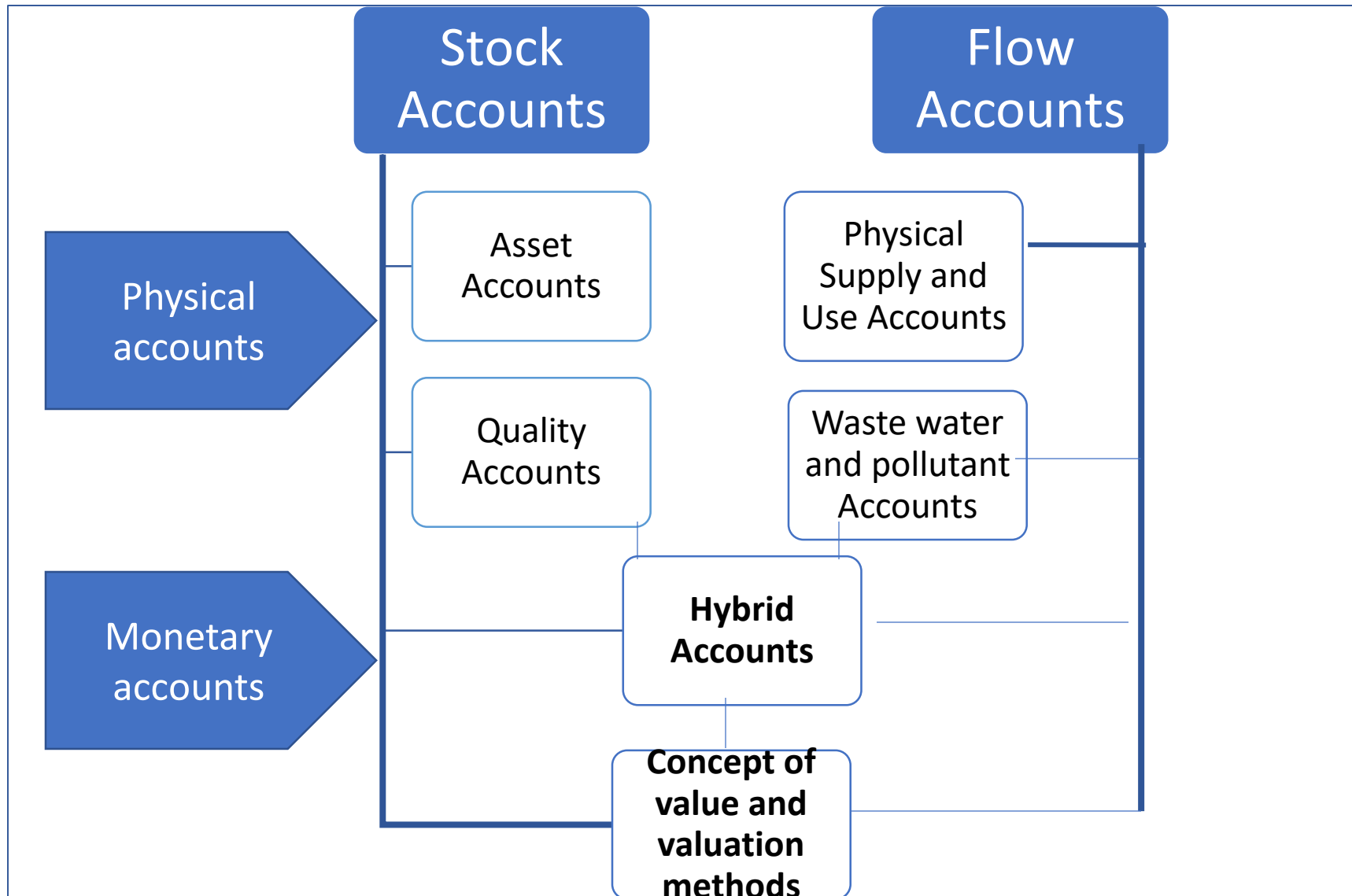
How can private funding be attracted and used

Competition for scarce public funds may delay investments and maintenance

Water accounting as a IWRM tool

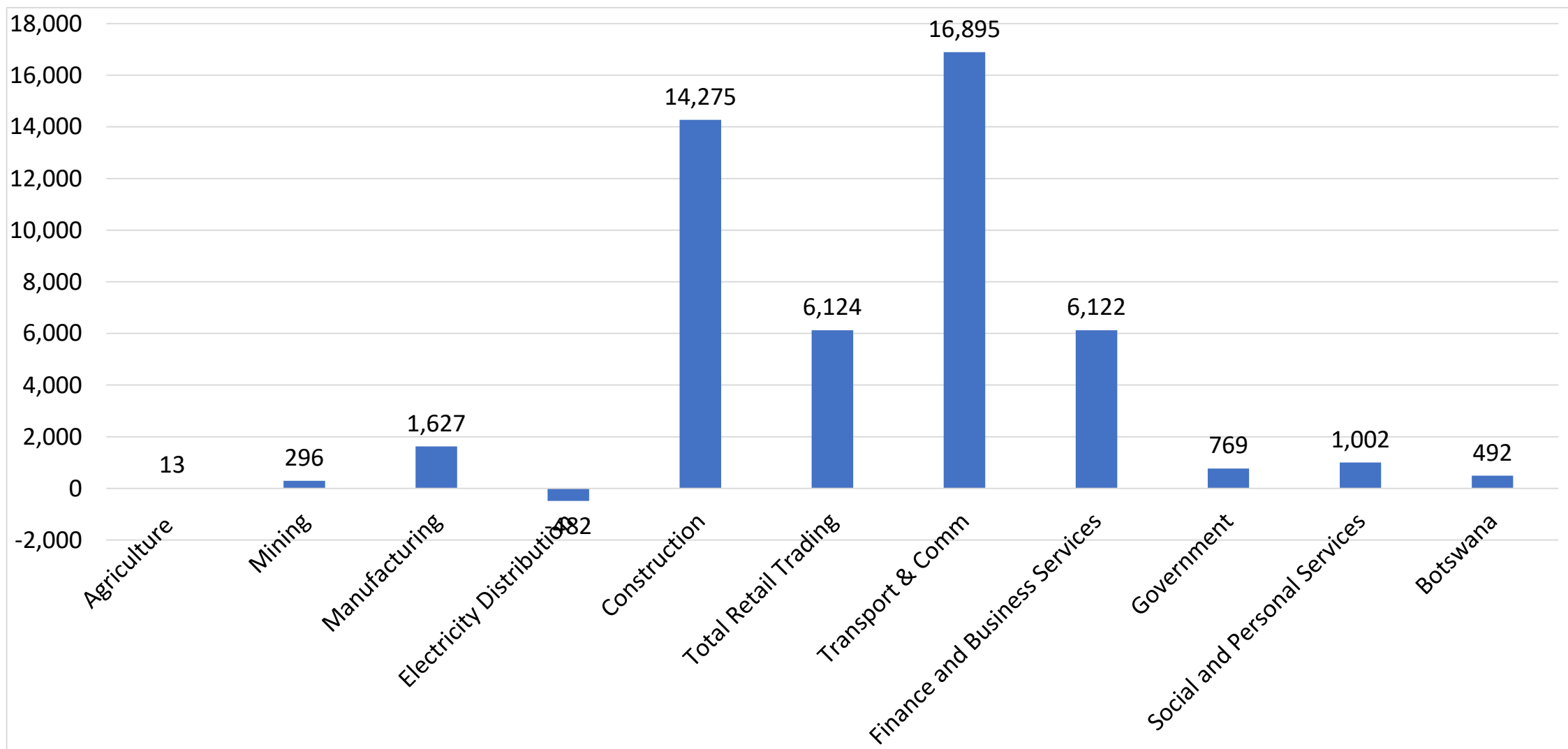
- WA record annually flows:
 - From the environment into the economy (*abstraction*);
 - Within the economy (*distribution*)
 - Flows from the economy into the environment (*return flows*).
- Stock and flows.
- Physical and monetary accounts
- Link with water infrastructure:
 - Water Infrastructure in stock accounts
 - Values indicate importance of water flows
 - Records subsidies and UafW (monetary losses; not physical)

UN SEEA-water framework



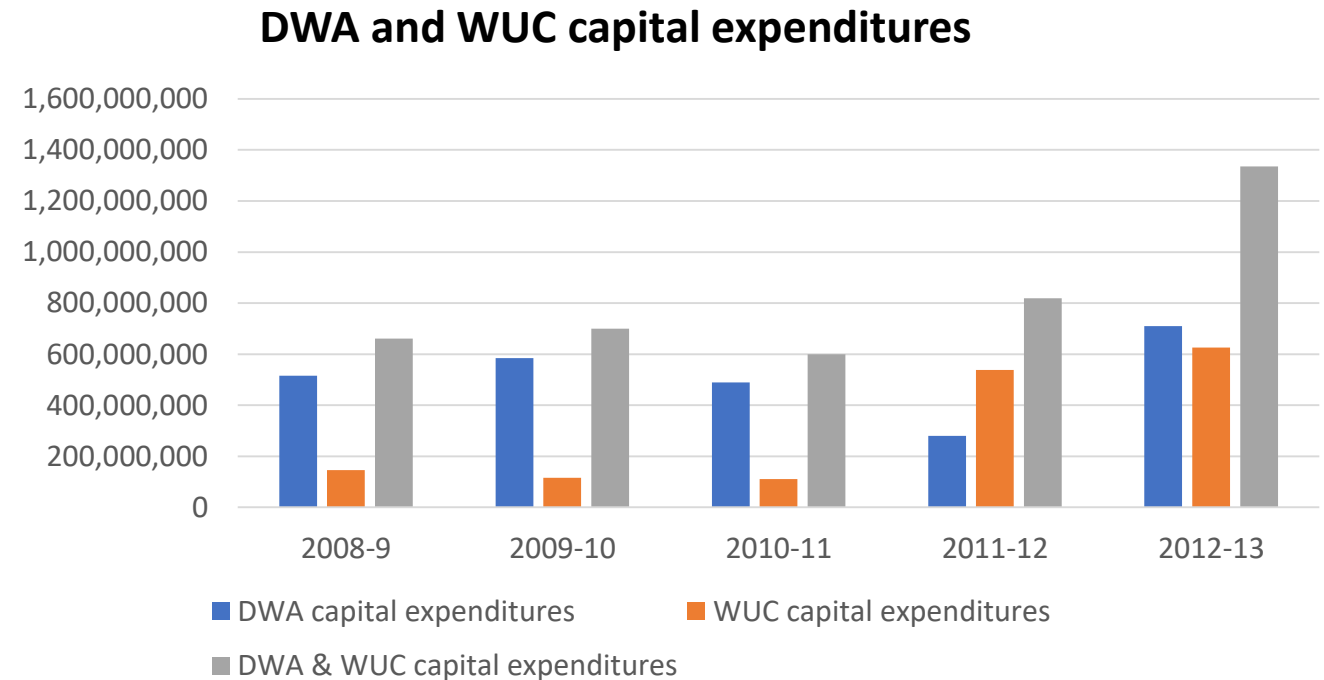
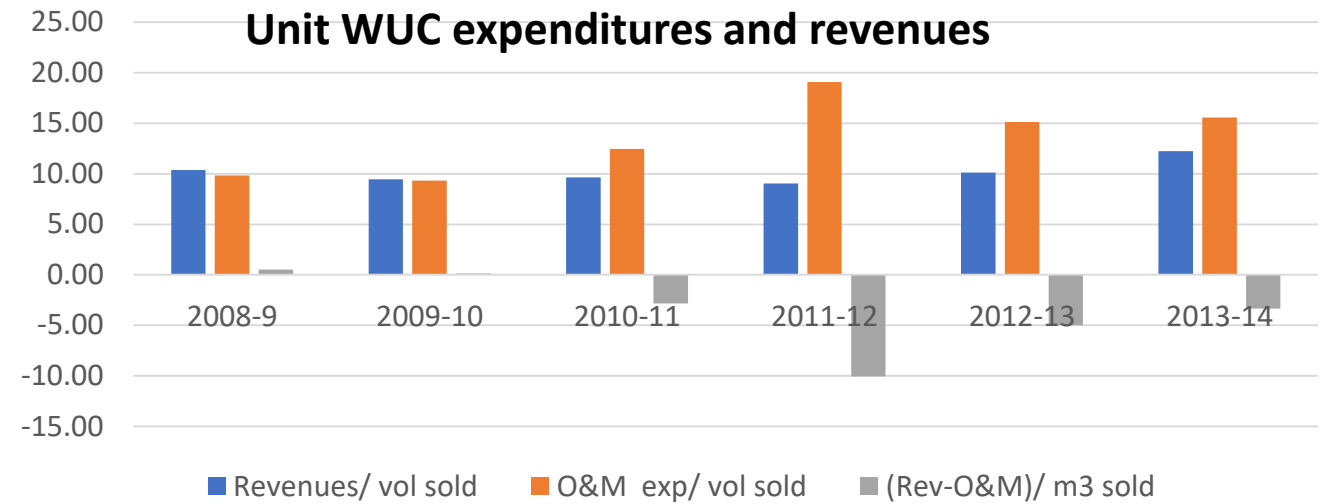
Average annual value added per m³ by sector (2010-11 to 2013-14; constant 2006 BWP)

Source: Botswana 2015 Water Accounts report (www.water.gov.bw).



Public expenditures Botswana

- *WUC does not recover O & M costs since 2010/11*
- *Overall capital costs have doubled since 2010/11 to P 1.3 billion*
- *Government subsidies in 2 forms:*
 - *Direct subsidies: livestock and some mines*
 - *Government water tariffs much higher than those for households and businesses*



Transboundary Water Resource Management

- Applies to most large scale surface water sources
- SADC protocol, RBOs and MoA between member states
- Documents:
 - Transboundary Diagnostic Analysis, IWRM plans and Strategic Action Plans
 - Multisector Investment Opportunity analysis (e.g. Zambezi and Okavango)
- Infrastructure:
 - Conditional development: *notification duty* etc.
 - Development of *joined* infrastructure
 - Often emphasis on irrigation and hydropower.

Climate change & water infrastructure

- Climate change needs to be included in the:
 - Impact assessment of projects
 - Design of water infrastructure
- The Climate Resilient Infrastructure Development Facility (CRIDF) has developed a climate change index (CCI)
- Access to 'green' funds
- Application of the CCI to MSIOA of the Okavango basin shows:
 - Significant different social, economic and environment impact score under high and low likelihood CC.
 - The Okavango Delta is more sensitive & vulnerable to CC than the Angolan highlands
 - CC is a critical factor to be included in development of the CORB.

Assignment

- Does your country/ organisation have:
 - An IWRM-WE plan?
 - A national water master plan
 - A WDM plan?
 - Up-to-date water policies and legislation?
- What are the key issues for IWRM in your country/organisation
- What key water infrastructure is in place and what is being planned?
- Describe key variables of your country relevant for financing (e.g.):
 - Environment: natural water scarcity;
 - Economic situation: growth, public finance, credit ratings, private sector funding
 - Social situation: poverty levels, access to water & sanitation
 - Demography: population and settlement patterns
 - Governance: stability, transparency, effectiveness & efficiency

Some literature

- Banerjee, S.G. & E. Morella (2011). Africa's Water and Sanitation Infrastructure: Access, Affordability, and Alternatives. World Bank.
- CRIDF+ (2017). Unlocking international finance for water infrastructure in Angola (mostly linked to climate change).
- Department of Water Affairs (2017). Botswana Water Accounting Report 2015. Government of Botswana.
- High Level Political Forum on Sustainable Development (2018). Advance briefing on SDG6 Synthesis report on Water & Sanitation.
- High Level panel on Water (2018). Making every drop count: an agenda for water action.
- World Water Assessment Programme (2017). The UN World Water Development Report 2017: wastewater: the untapped resource. Paris, UNESCO.
- World Bank (2010). The elusiveness of meeting the MDGs.

THANK YOU

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