



# WaterNet short course Financing of Water Infrastructure projects:

## Optimising finance sources

Jaap Arntzen

11<sup>th</sup> April 2018, Johannesburg, South Africa



implemented by  
**giz**



# Structure of presentation

- Identification of investment needs
- Optimising financing; whose perspective?
- Possible funding sources
- Project funding models
- Investor's perspective
- Lesotho Highland Water Development Project

# Identification of infrastructure needs

- **Current** infrastructure:

- Maintenance & rehabilitation
- Reducing UAfW/ NRW
- What measures are prioritised?

- **Planned** infrastructure:

- Does it increase the safe yields of the water infrastructure?
- Does it minimize the increase in unit water costs (e.g. marg. supply costs)
- What kind of infrastructure is prioritized?
  - Dams, aquifers, transfer schemes, conjunctive use, recycling plants, desalination etc.

# Optimising of what?

There is no “one-size-fits-all” solution, and each financing model has to be structured to suit the specific circumstances. This is particularly the case for water infrastructure, where individual projects are highly site-specific and often involve a number of stakeholders (Head, 2006, p.2).

- Water sector – country (economic):
  - Optimum varies from case to case.
  - Ensure a sustainable water supply for domestic and productive use to ensure sustainable development.
    - Economic: lowest supply costs – cheapest source of finance
    - Social: Affordability and Access (SDG6)
    - Environment: Maintenance of ecosystems & minimising environmental externalities and foregone future benefits
- Investor (financial):
  - Returns taking into account opportunity costs of water investments

# Possible financial sources

- Public funds: 3 Ts
  - Tariffs: widely considered most efficient, but affordability and collection issues
  - Transfers-subsidies unsustainable & growing competition from other sectors (e.g. health & education)
- Private funds: investments, loans & grants.
- Public-private sector partnerships: balancing 3 Rs.
  - Responsibilities: how are responsibilities shared?
  - Risks: political, commercial, project
  - Rewards: gap between financial & economic returns
- Observations:
  - Public funds can leverage private funds
  - Private funding requires solid financing proposals



Private foundations  
gave USD 23.9 billion  
for development  
from 2013 to 2015  
(OECD, 2018)

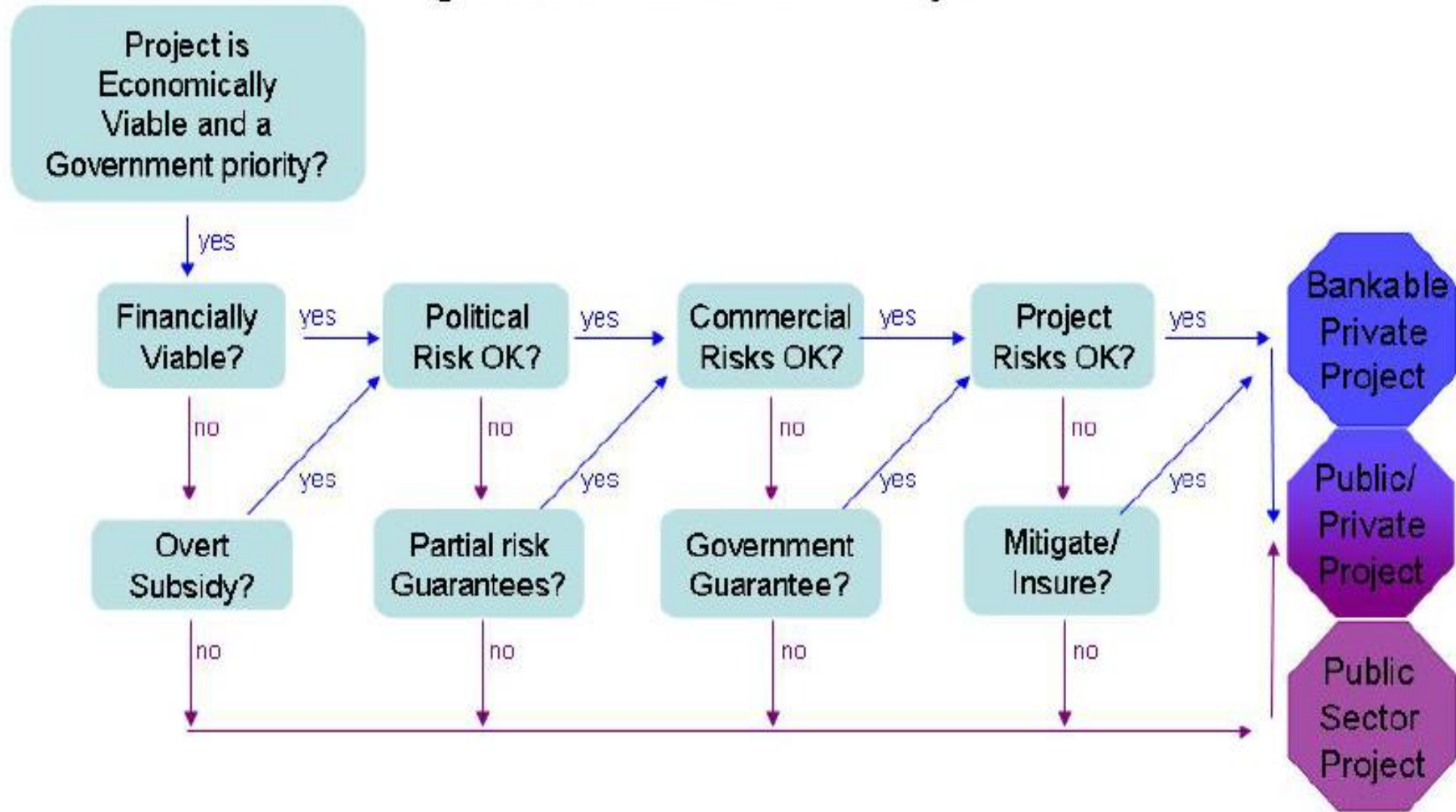
# Project finance model

Water infrastructure projects are long term projects often with high risks & low returns. Unattractive for private investors?

- Government needs to decide whether:
  - the project is suitable for private sector participation;
  - the physical assets should be in public or private ownership;
  - there should be a public shareholding (private company); or private funding (public project).
- Decision during early project preparation.
- Requirements for governments. Conduct:
  - Technical & economic feasibility studies
  - Environmental & social impact assessment
  - Defining project structure, financing & procurement

More attractive projects: hydropower, NRW reduction & wastewater treatment & re-use,

Figure 3.1: A Private or a Public Project?



Source:  
Head, 2006,  
p31.

# Types of water infrastructure development

- Private sector development:
  - BOOT: Build, Own, Operate and Transfer (after e.g. 15-25 years)
  - BOT: Build, Operate & Transfer (after e.g. 15-25 years)
  - BOS: Build, Operate & Sell (after e.g. 5 years)
  - ROM: Rehabilitate, Operate & Maintain (e.g. for old hydropower schemes)
- Public sector development:
  - Parastatal:
  - Traditional public projects by government
- Public-private sector partnerships:
  - Public shareholding in private company
  - Private investments in parastatal



# Issues to consider for investments

- Economic & financial viability:
  - Bridging gaps between economic and financial viability through subsidies and project restructuring
- Risk profile: political, commercial and project risks
  - Risk mitigation and balancing remaining risks and rewards
  - Risk sharing between private and public sector
- Environmental & social sustainability:
  - Adherence to international guidelines such:
    - *IHA Sustainability guidelines* (hydropower)
    - *Equator principles* for large projects of US\$50 million + (sustainability standards for the financial service industry). Covers most of the international commercial funding. Classifies projects based on environmental & social risks

# Accessibility of funding sources

- Depends on the funding sources requirements; and
- Situation of the country & institution in need of finance (e.g. national governments, local water suppliers, parastatals etc.)
- Local authorities often limited direct access to funding

# Case study lessons for private financing (Read, 2006)

- Private projects require a strong sponsor with sufficient financial resources & resilience
- Private sector may succeed where public sector fails
- Exchange rates are a major concern & risk. Mitigation: use of local currencies
- Typical equity/debt ratio of 30/70; higher equity with high risk projects
- Most common source of commercial funding: international banks and multilateral development banks.
- Regional markets can increase the bankability of projects
- Refinancing of operational projects can reduce the costs

# Key determinants of successful private sector investments

- Support of international financial institutions (esp. MDBs)
- Pro-active government: project preparation, enabling environment & partnership
- Well prepared financial proposals needed to convince private investor

# Investor perspective: cash management models

- Examples:
  - Baumol's model of cash and inventory management:
  - Wilson's Economic order quantity model.
- In brief:
  - Consider the opportunity costs of cash and the transaction costs and aim to minimise these costs
  - Models have various assumptions: such as constant and predictable revenue flow.

# Lesotho Highland Water Development project

- Source: *Chris Head (2006). The Financing of Water Infrastructure. A Review of Case Studies. Bank Netherlands water partnership programme.*
- Project: Dams for hydropower in Lesotho and water transfers to South Africa.
- Total costs (phase 1 completed in 2004): US\$2.8 billion generating 72MW power for Lesotho and 29m<sup>3</sup>/s water for SA. Phase 2 increase transfer to 70m<sup>3</sup>/s
- Project to complex and risky for private sector. Developed as public project with mixed funding
- Implementation through the Lesotho Highland Development Authority (parastatal); the Trans Caledon Tunnel Authority, manages South Africa's obligations and pays the royalties for delivered water
- LHDA raised all finances; SA government provided guarantees for all loans.
- Benefits:
  - South Africa: extra and cheaper water for Gauteng (est. savings for water users of \$30 million p.a. (EIB))
  - Lesotho: hydropower and royalties (10% of government revenues & 4% of GDP).

# Financing phase 1A (1990-98)

- Strategy:
  - Use concessionary funds where they were available (only for Lesotho).
  - Maximising foreign borrowing to reduce pressure on foreign reserves.
  - Sovereign Guarantees by the SA Government (through a trust fund).
  - Contractor-driven financing with the responsibility for finding financiers left to the contractor.
  - Access to funding limited by boycott of apartheid South Africa, which also faced foreign exchange problems
- Results:
  - 36% international concessionary funding (through Lesotho)
  - 64% local funding (exports credits and water bonds)
  - 85% of finance was underwritten by SA government.

# Financing of Phase 1b (1995-2003)

- Contractor financing was no longer linked to commercial funding
- Over 10% of expenditures go to environmental and social components.
- More funding options post-apartheid and with visible results of Phase 1A



# Literature

- Head, C (2006). The financing of water infrastructure: a review of case studies. BNWPP.
- IHA guidelines: download from [www.hydropower.org](http://www.hydropower.org).
- Equator principles: download from [www.equator-network.org](http://www.equator-network.org).

THANK YOU

Contact details:  
Dr. Jaap Arntzen  
[jarntzen@car.org.bw](mailto:jarntzen@car.org.bw)  
[info@car.org.bw](mailto:info@car.org.bw)  
[www.car.org](http://www.car.org)