# Assessing financial sustainability of water and sanitation services

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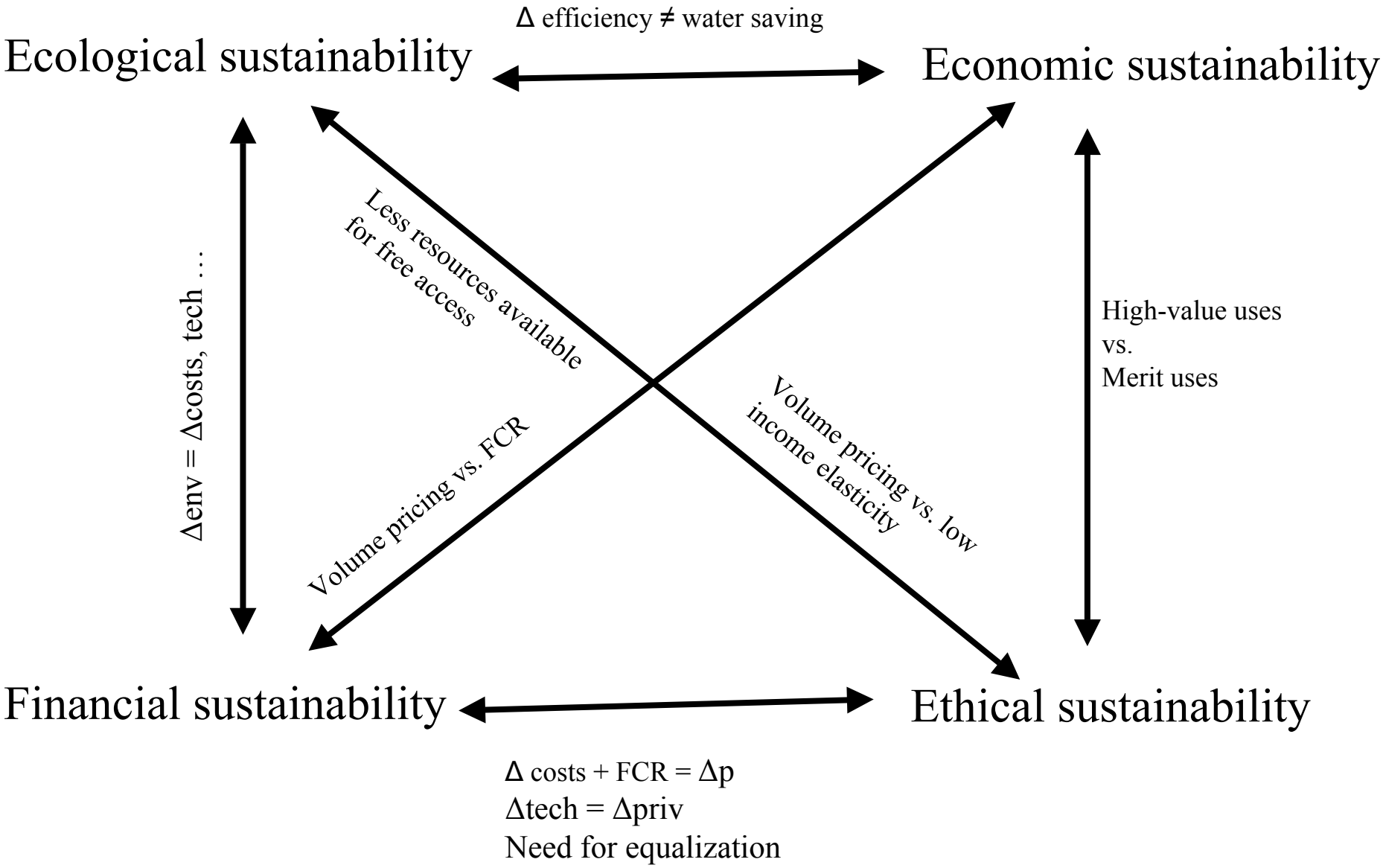
# Background

- Update of Oecd comparative study on water and sanitation pricing
- An innovative approach
  - Water pricing debate dominated so far by environmental and micro-economic approach ⇔ water pricing as instrument of environmental policy; comparison mostly among pricing *levels* and *structures*
  - FCR as a compromise btw budget constraints and polluter-pays principle
  - Focus on sustainability and trade-offs imposed by its different meanings
  - Focus on *financial sustainability* ⇔ capacity of WatSan to attract financing and sustain the system in the long run
- Functional to econ regulation, whose missions are assumed to be:
  - *to guarantee that utilities are enabled to pursue public service obligations*
  - to protect consumers against abuse of market power
  - *to guarantee financial equilibrium in the long term*
  - to enhance efficient operation and long-run development of the system

# Conflicting sustainability targets …

- Ecological ⇔ managing water as a limited environmental resource
  - Guarantee that water use < carrying capacity
  - Account for externalities
  - Achieve IWRM
  - Maintain water-associated ecosystem services
- Economic ⇔ water as a scarce resource having an economic value
  - Guarantee that available resources are allocated efficiently
  - Guarantee that investment in system expansion is done efficiently (B>C)
  - High-value uses should have priority
- Financial ⇔ water services as economic activities
  - maintain and develop artificial assets
  - Guarantee that capital and operational costs are recovered
  - Attract adequate €, technologies, skills etc into the water service
- Ethical ⇔ water as a social right and a SGEI
  - Satisfy basic water demands in an affordable way
  - Collective affordability vs. affordability for the poor(est)
  - share resources and financial costs equitably
  - ensure that public good are adequately spelled out and provided
  - decide in a democratic, transparent and accountable way

# … and trade-offs affecting pricing



# What is special with water

- WatSan as a textbook prototype of market failure
  - The “most natural of all monopolies”
  - Prevalence of fixed costs (mostly sunk for long time)
  - Little opportunities for enhancing competition
- Externalities and public goods components
  - individual demand is only a part of WTP (eg sanitation, rainwater management, public health
  - Marginal cost only partially depends on volumes (eg sanitation)
- Elasticity of demand low, but …
  - Demand elasticity to price low except at the margin for some voluptuary uses (eg garden watering; car washing)
  - Demand elasticity to income also very low
  - Elasticity of price elasticity to income high ⇔ price elasticity is higher for low-income people if they cannot afford the service

# The economic theory of utility pricing

- First best (no budget constraint)
  - Pricing at the (short run) marginal cost (could be very low!!)
  - Recover the fixed cost through taxation
  - Engage in system expansion only if B > C
- Second best (budget constraint)
  - As above, but recover the fixed cost from the consumers (sharing the fixed cost in some way, possibly through Ramsey-pricing)
- Third best (distributional constraints)
  - As above, but share fixed costs according to ability to pay; ev. equalize
- Fourth best (account for externalities)
  - Adopt incentivating structures according to water policy objectives
- Fifth best (introduce incentives for x-efficiency)
  - As above, but introduce price caps and pricing models based on competitive benchmarking; negotiate investment requirements etc

# Pricing aims and approaches

| Sustainability principle | Aim of water pricing | Marginal cost | Full cost | Volumetric price | Perequation Admitted |
|---|---|---|---|---|---|
| Ecology | Reduce pressure on natural resources | No | No | Yes (incr) | No |
| | Encourage water-saving | No | No | Yes (incr) | No |
| | Improve water quality | Yes (weak) | No | No | No |
| Economic efficiency | Allocate water to the most beneficial uses | Yes | No | Yes | No |
| | Avoid over-investment in facilities | No | Yes | Sometimes | No |
| | Efficient use of existing facilities | Yes | No | Yes (decr) | No |
| | Ensure x-efficiency and avoid monopoly rents | Yes | No | No | No |
| Cost recovery | Ensure viability of water management systems | No | Yes | No | Yes |
| | Maintain asset value over time | No | Yes | No | Yes |
| | Guarantee remuneration of inputs | Yes | Yes | No | Yes |
| | Sustainable investment | No | Yes | No | Yes |
| Ethical / social | Share costs in a fair way | No | Yes | Yes | Yes |
| | Ensure affordability for merit uses | No | No | No | Yes |

# Shortcomings of past comparative analysis

- Comparing final prices  is misleading
  - Costs are very variable according to local circumstances
  - Customers pay in many different ways and not only “tariffs”
  - Equalization mechanisms
  - For the purpose of financial sustainability, what matters is reliability of cash flows, not their economic nature
- Comparing cost recovery on accounting base is misleading:
  - Costs – and especially CAPEX – are accounted for in very different ways
  - The cost of capital is endogenous ⇔ depends on risk profiles and particularly (i) on regulatory risk and (ii) on the presence of smart financial mechanisms aimed at risk sharing

# Some examples

| | Asset value | Depreciation | r | Equalization |
|---|---|---|---|---|
| **Traditional** | Not accounted | Not depreciated | based on conventional inter-gov rate | Public budget |
| **British** | New investment + market value of assets bought at privatization | Private sector accounting rules | Market rate based on investors' expectations | Territorial + no volumetric charge |
| **French** | Historical cost | Loan reimbursement | Based on public sector borrowing rates | Ear-marked basin systems |
| **German** | Full reconstruction cost | True economic life | Based on public sector borrowing rates | Cross-subsidy + public sector guarantees for loans |
| **Italian** | New investment | Depreciation rates allowed by tax legislation | Market rate based on investors' expectations (capped at max 7%) | Territorial (some) + public budget for large projects |

# Aim and methodology of the study

- Aim: developing indicators for assessing financial sustainability in the short-medium and long run
  - Short-medium run: assess the coherence of cash flows with actual investment requirements and financial obligations
  - Long run: compare the available cash flows (actual and perspective) with long term investment needs (estimated on a reconstruction cost basis)
- What are available cash flows?
  - Methodology: consider cash flows according to the *degree of reliability and secureness* (regardless their economic nature)
  - Free cash flow generated by system operation (Ebitda)
  - Internal cross-subsidies (eg margins from other utilities)
  - Revenues from ear-marked taxes

# Some preliminary results

| | SRF | LRF |
|---|---|---|
| | EBITDA/financial burden | FCF / (dK + rK) |
| Germany 1 | 1,36 | 1.15 |
| Germany 2 | 2,83 | 0.70 |
| Italy 1 | - | 0.32 |
| Italy 2 | - | 0.45 |
| Usa 1 | | |
| Usa 2 | | |

# Concluding remarks

- Proposal to systematically assess financial sustainability of WatSan (in Oecd statistics)
- Proposed indicators are meaningful and easy to calculate
- Evidence that more sustainable utilities also imply lower risk, lower cost of capital and (possibly) lower rates in the long term
  - A.Massarutto, V.Paccagnan, E.Linares, 2008, “Private management and public finance in the Italian water industry: a marriage of convenience?”, *Water Resources Research*, forthcoming