Research Semester Prof. Dr. Mark Oelmann at FWI/UCT

„Water Scarcity – Demand Side Measures and the Particular Role of Economic Instruments”

HOCHSCHULE RUHR WEST
UNIVERSITY OF APPLIED SCIENCES
WIRTSCHAFTSINSTITUT

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0. Agenda

1. Who am I?

2. The overall agenda

3. In Particular: Water Scarcity and Particular Role of Economic Instruments

1. Who am I?

Teaching

Applied Research

Start-up/Consulting

www.mocons.de

- Economist, Cultural Anthropologist; at HRW since March 2011; currently team of eight (thereof 2 Ph.D. students)
- Before: Investment Banking, Assistant to Head of Economic Advisory Panel to German Government, (International, Regulatory, Strategic) Consultancy in Water/Wastewater
- Ph.D. on Water Utility Regulation; „Advisory Panel on Future Regulation" (OFWAT); GIZ Work in Kenya, Zambia…

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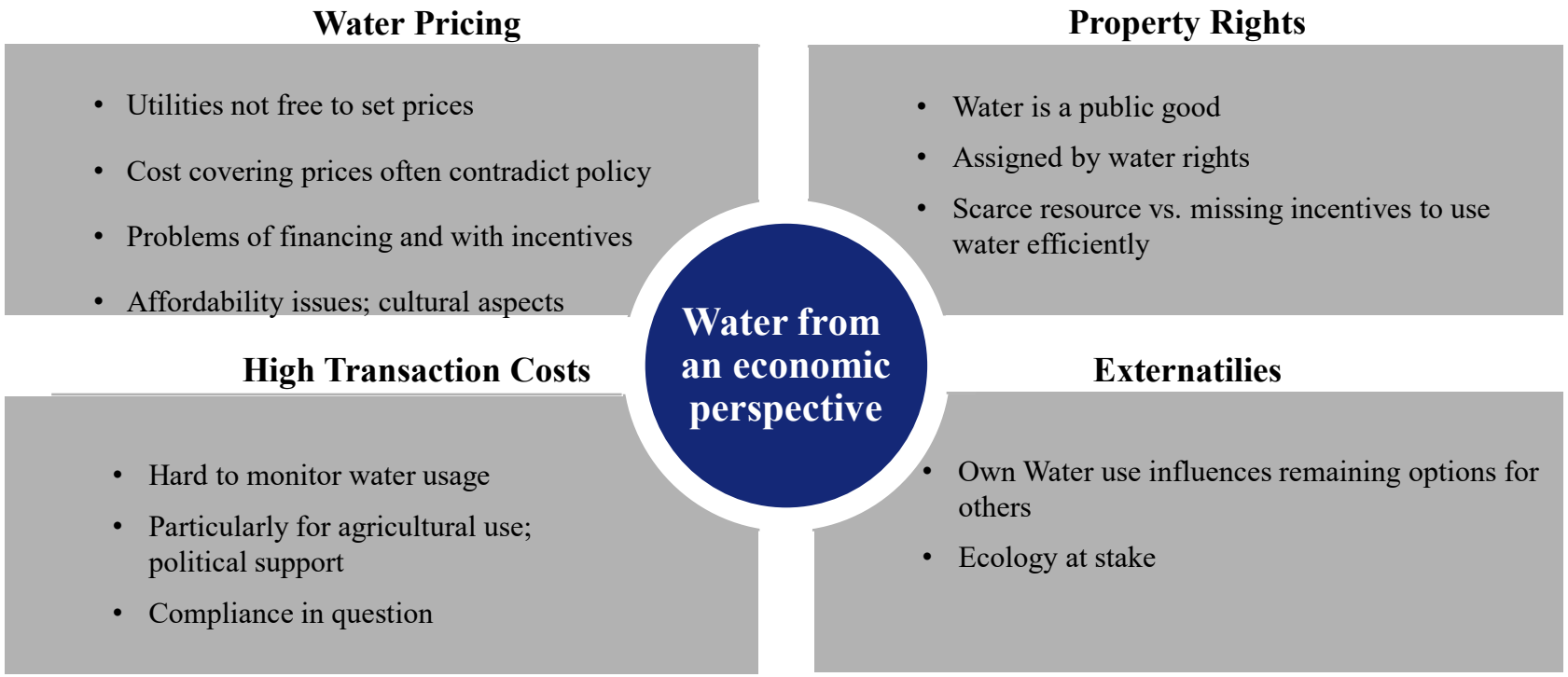
2. Setting the Scene: Water and Economics

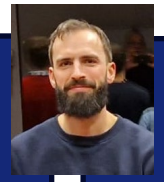
Water and Economics

Overall approach in economics: Use markets to most efficiently assign scarce resources.
But: Market failures in cases of externalities, natural monopoly and asymmetric information → all of these we have in water! And more…



2. The overall agenda

Research Question: How can we categorize water use competition worldwide, which best-practice examples do we find and under which circumstances might those be applicable?



1

Structured description of regions with water scarcity problems

2

Mesusres with particular focus on DSM

- Capetown
- Other

3

Effects of different DSM

- Capetown
- Other

4

Contribution of economic instruments

- Incentives for end-user of water utility
- Particular role of water rights

5

Precondition for both communication as well as for application of economic instruments: Smart Meters, Transmission, Data Usage

7

How to attract DSM?

- The political process
- Findings of transforma-tion research

8

Conclusions/ Recommen-dations

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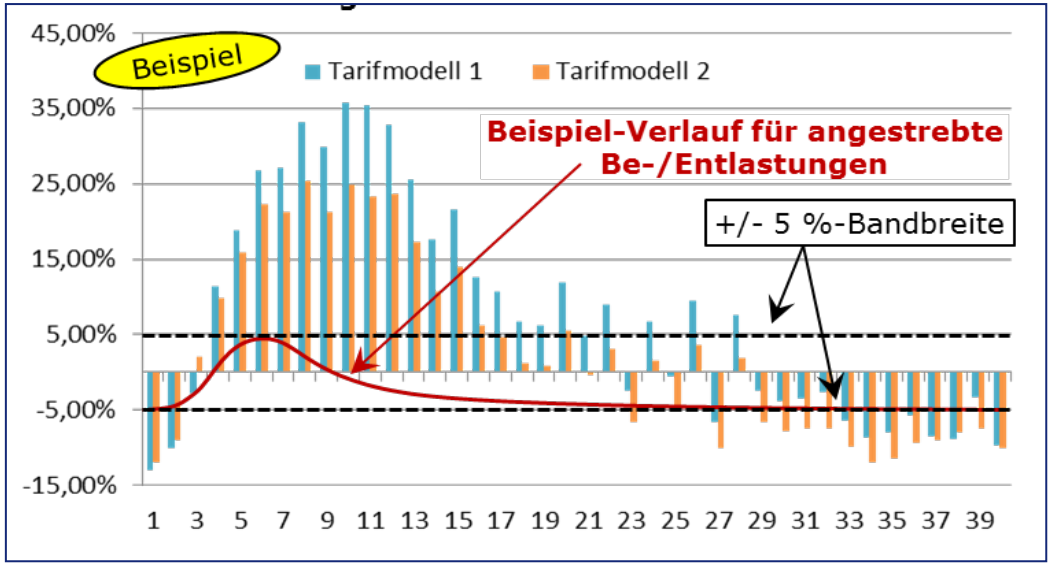
3. In Particular: Water Scarcity and Role of Economic Instruments

Our background: For more than 15 years we are into price modelling

End-user-pricing

Improving stability of revenues in times of decreasing demand

Modelling new pricing models for approx. 40 different regions in Germany; tarif strategy Liban



Besides that **load pricing** → Creates sensitivity about main service of water company: Provision of infrastructure
Besides that **usage-based pricing** → consumption-based pricing model; customer does not pay e.g. for a pump but for the service of pumping; how to price this? Link to Machine Learning activities

3. In Particular: Water Scarcity and Role of Economic Instruments

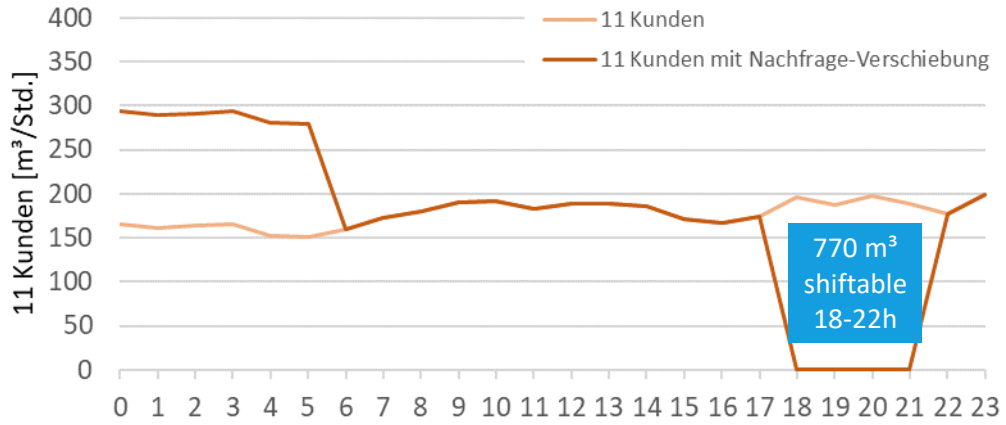
Let us now turn to pricing models as reaction to climate change challenges – a) High loads

End-user-pricing II

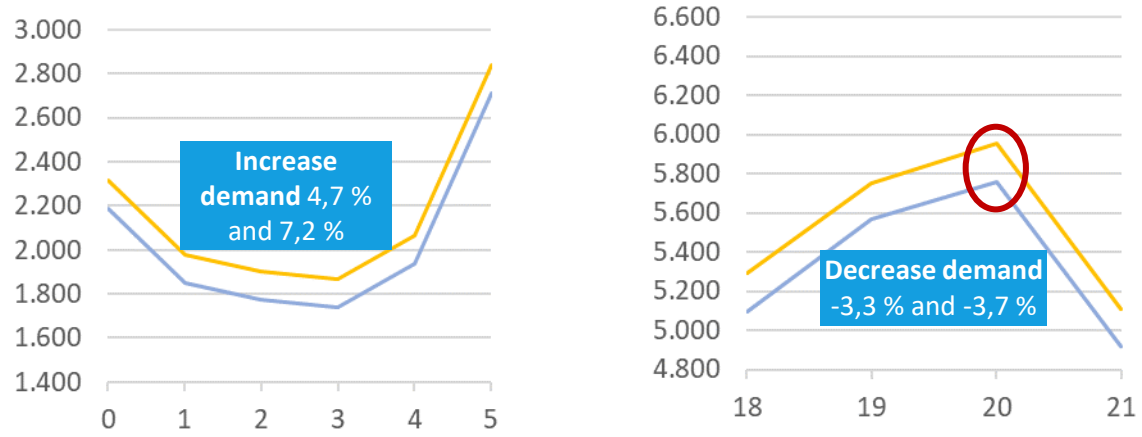
For Germany: Climate change leads to hotter and longer drought periods → Increase of loads in certain time periods → **Infrastructure ought to be extended** or demand shifted → Models developed for bigger clients of water companies; next step: Models for household clients (reasons to be sceptical)

Example: Day with highest demand 2019 (24 June)

Shifting demand for 11 biggest clients



Implications of shifting demand on 24 June 2019

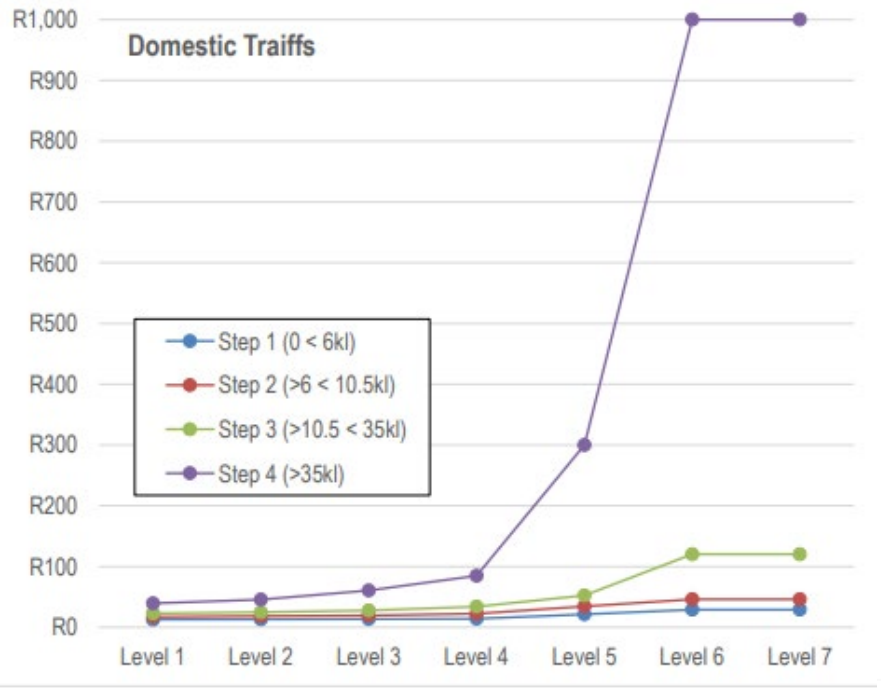


3. In Particular: Water Scarcity and Role of Economic Instruments

Let us now turn to pricing models as reaction to climate change challenges – b) Water scarcity

End-user-pricing III

Climate change leads to hotter and longer drought periods, strong stormwate events, less water availability → Pricing models may help in decreasing overall demand.



Questions related to this pricing model:

- What effect did it have? Price elasticities of demand for different client groups (Visser/Brühl (2021) correctly refer to studies → reducing demand 1-3% for each 10% price increase; for clients in Level 6 and 7 higher?)
- Demand structures in more detail
- Interconnection with other measures?
- Smart meter endowment?
- Experiences on how clients actually reacted?
- Communication measures?

- Experiences with such pricing models in other regions of world?

3. In Particular: Water Scarcity and Role of Economic Instruments

Increasing water scarcity: The role of water rights

Water rights

Starting Point: If water more scarce, what about current rights and what about issuing new ones?

a) Too many water rights handed out

b) Inefficient water rights allocation

Design of Water Rights

Water ~ linked to Land Rights

Buying water rights → Applying auctioning systems

Options to dynamise water rights? → less water in a year → less water per water right

Water rights trading

- **Trade of permanent vs. temporary rights**
- **Entitlements vs. claim in a year**
- **Trade betw. ground- and surface water?**
- **Trade betw. Regions?**
- **Impact on sustainability, equity?**

Less formally?

What about assigning water rights not to individual users but to groups?

E. Ostrom: Building know-ledge and trust (AER, 2011)

Examples: Punjab (Pakistan), Crocodile River (SA)

Thank you for your attention!

- Do you have any questions, remarks?
- What attracted your interest?
- Do you see synergies between your and my work? What would help you?
- What research, which papers should I consult?
- Which people, scientiests, institutions should I contact/meet?

Prof. Dr. Mark Oelmann

Professor Water- und Energy Economics

Head of interdisciplinary research group „Wasser Economics and Water Management“

Tel.: ++49 208 88 254 358

Mobile: ++49 152 53855451

Mobile SA: 07 14371141

mark.oelmann@hs-ruhrwest.de

Room: NEB 055, Room 3.38