Legacies, gaps, subterfuge and echo-chambers; Reflections on the absence of managed water re-allocation.

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Introduction: message of this presentation

Should we be concerned about; (a) the theory and practice of water allocation in river basins and aquifers? (b) how effective we are at re-allocating water to meet changing priorities and support resilience during drought? (c) The interplay of science, participation and policy?

This presentation argues that while the theory of water allocation draws from well-recognised IWRM norms of pricing and licences (next slide), other observed drivers of allocation are no less important. They are not easy to describe, are much more informal/hidden and arise as an outcome of sector-centred activity rather than as an allocation-centred activity.

We need to understand how & why water allocation functions and arises if we are to purposively manage the sharing of water to competing sectors.

How is water allocation *supposed* to happen?

Water allocation aims to respond to changing priorities for water withdrawal/ abstraction

- It aims to drive water use down in one sector (including the environment) to reallocate that water to another sector.
- This may be in response to droughts or increasing water scarcity (e.g. due to increased demand).

There are three main types of institutional mechanisms to change patterns of allocation (Dinar et al. 1997):

1. market mechanisms (pricing and trading) to reduce withdrawals;
2. administrative decisions (licences and rights) to cap withdrawals;
3. collective user management (informal rights and practices)

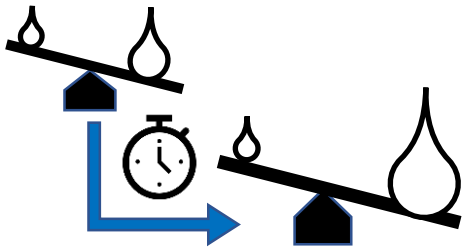
But…allocation doesn't follow these norms

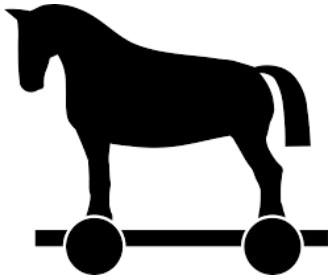
Observations from South Africa (& Tanzania)

- Water allocation in river basins and aquifers is far from simple and rarely 'effected purposively' using these institutional mechanisms
- Water allocation appears to be a 'residual' both in quantity and in process. (*Residual: "remaining after the greater part or quantity has gone; remaining after the removal of or present in the absence of a causative agent". Oxford Dictionary)*
- Water allocation is a cumulative result of 'hidden allocation' processes
- Hidden allocation processes: 'legacies, gaps, subterfuge, echo-chambers'

Legacies, gaps, subterfuge and echo-chambers

- *Legacies*; momentum effects of previous allocations from open river basins
- *Gaps*; missing or diminished agency or understandings or metrics
- *Subterfuge*; purposive misleading artifice by key players/abstractors
- *Echo-chambers*; dialogue that fails to break the boundaries of the system and/or dialogue-support that insufficiently transforms dialogue



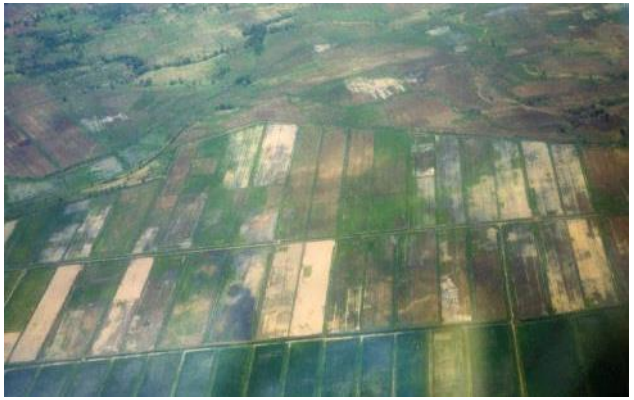


Water allocation in the Western Cape

- Current water licenses for fruit farms are from the 1960s when irrigation efficiency was lower and crops more diverse
- Irrigation efficiency at the orchard level has been increasing over the last 40 years (channels to sprinkler to drip)
- Water consumption at the catchment level has increased because farmers have increased their area and intensity of production, along with increased urban (domestic / industrial) demand
- Higher consumption results in a lower “headroom” between water supply and demand
- Licenses that do not change with changing farm water efficiency undermine the governance of water allocation from agriculture to cities

Water allocation in Ruaha basin, Tanzania

- Licenses are mainly ‘paper’ – do not relate to actual abstractions dictated by concrete intakes which fluctuate as river flows fluctuate.
- Intakes are not proportionally designed, and do not regulate or meter water either by design or by operation
- Water duties for licenses 2.0 l/sec/ha (twice what is required)
- Dry and wet season irrigation is on the increase (see below).



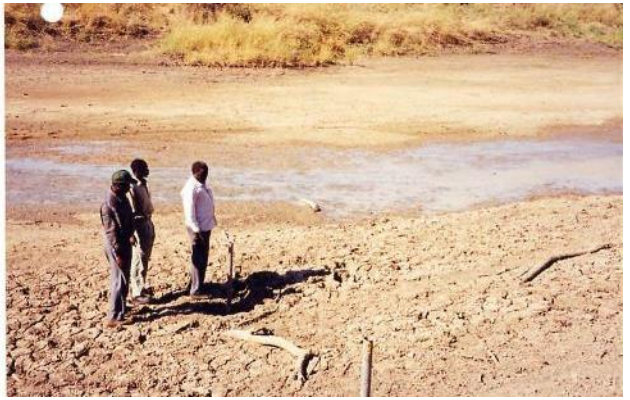
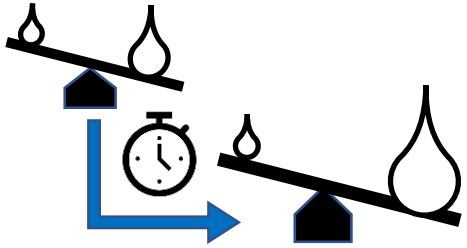


Photo by B Lankford, 2006, Ruaha River just upstream of Usangu Wetland

Legacies – South Africa



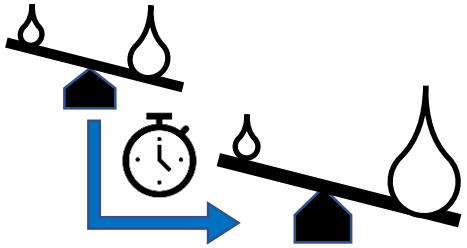
Legacies; momentum effects of previous allocations and licence stipulations from open river basins. In Western Cape & Limpopo, historic irrigation abstraction continue to drive current shares. Agriculture was a powerful lobby pre-1994 and is currently a large employer in a country with high unemployment, has leverage from social/economic perspective.

A lack of capacity to control water allocations by government allows the status quo to remain – see next slide

Landcover (ha)	1990	2014	Difference (ha)	Difference (%)
Cultivated commercial crops	5 476	7 504	2 028	37%
Cultivated commercial orchards	28 177	36 282	8 105	29%

- *MAR for Groot Letaba is 382MCM; of this, 127MCM is allocated for irrigation across the catchment. 20MCM for domestic and 72MCM for environmental flows*
- *Water allocation for irrigation in Groot Letaba unchanged since 1970s. Analysis of land cover between 1990 and 2014 shows ~30% increase in area under orchard production, suggesting growers are using efficiency increases to expand area under production*.

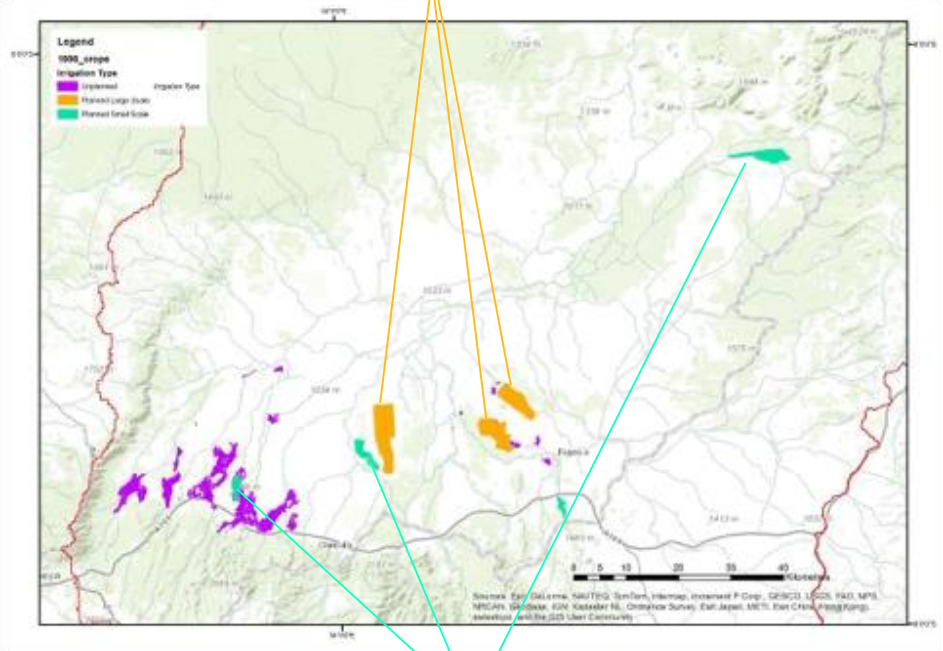
Legacies – Usangu ,Tanzania



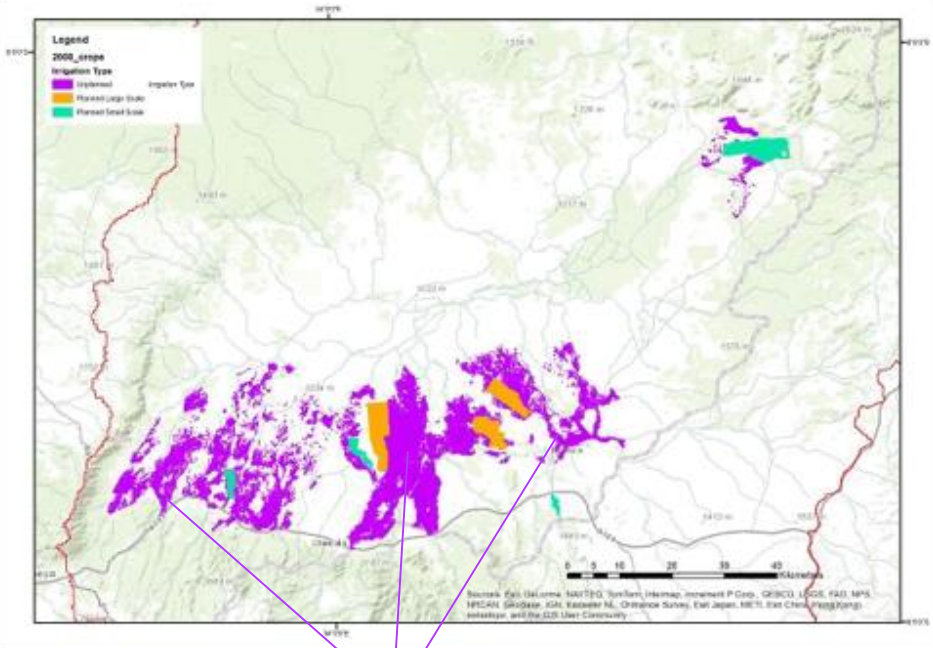
Source: World Bank Group, unpublished report (2015)

Large-scale schemes of Mbarali, Kapunga and Madibira

1998



2013



Planned small-scale schemes

Unplanned irrigation development

Gaps

Gaps; missing or diminished agency or understandings or metrics

- In South Africa: Lack of government capacity to draw up new licenses and monitor existing metrics
  - *Reflecting on the worst drought to hit South Africa in a century suggests that the most important water risk may be governance of water rather than drought.*
  - *Over allocation of water in catchments providing water to emerging farmers, and meet urban demand, that doesn't consider current abstractions*
  - *Less than 100 of the 250 engineering posts within the Department are filled.*
  - *Poor administration are causing a backlog of water license decisions (up to 2 years)*
  - *The lack of monitoring by Department of Water and Sanitation (DWS) has created opportunities for some unscrupulous water users to draw more than their allocation*
- Usangu. weak understandings of irrigation efficiency and how to raise it, yet water duties

Gaps

Tanzania

New attempts to restore river flows based on efficiency improvements

The Great Ruaha Restoration Campaign

Concept Note

BACKGROUND

The Rufiji River Basin

This Concept Note describes a new multi-stakeholder initiative to address the water resources challenges in

The Rufiji River Basin currently hosts three large hydropower stations (Mtera, Kidatu, and Kihansi) which account for more than 80% of Tanzania's installed hydropower capacity and generate about 40% of the energy consumed nationally. The basin's potential for

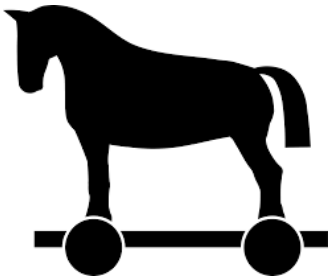
Workstream 2: Improving Agricultural Water Use Efficiency

Objective: Promote more efficient irrigation practices and improved agricultural water productivity.

Highly generalised understanding of efficiency

Actions		*Outcome Indicators*
Action 2.1:	Modernise physical irrigation infrastructure in irrigation schemes through lining of canals, introduction of conduits for water conveyance, construction of proper diversion structures, introduction of gates and weirs, etc.; prepare and cost projects for improving physical irrigation infrastructure in smallholder schemes.	▪ Kilometres of lined irrigation canals. ▪ Number of irrigation schemes with proper water diversion and water flow control structures/devices.
Action 2.2:	Improve the levelling of irrigation fields to reduce water wastage.	▪ Acreage of irrigation fields with improved land levels.
Action 2.3:	Establish demonstration and pilot projects for drip irrigation and other efficient water use technologies; large commercial farmers (like Kapunga), seed producers, and agribusiness donors to support smallholder farmers adopt new irrigation technologies. Example: develop an irrigation project around Darsh tomatoes processor and smallholder tomato farmers.	▪ Number of demonstration and pilot projects in existence.
Action 2.4:	Construct drainage canals to return farm drainage water back to the rivers.	▪ Number of irrigation fields that channel drainage water back to the rivers.
Action 2.5:	Promote the construction of rainwater harvesting facilities for use in agriculture to reduce dependence on river water.	▪ Number of rainwater harvesting structures for agriculture in the Great Ruaha.
Action 2.6:	Introduce water-efficient agronomic practices such as system of rice intensification; use of cover crops, effective field preparation, use of drought-tolerant high-yielding seeds, on-	▪ Number of farmers using water-efficient agronomic practices.

Subterfuge



Subterfuge; purposive misleading artifice by key players/abstractors

In Western Cape and Limpopo province, anecdotal evidence that some growers find ways of illegally withdrawing and consuming water in the face of drought restrictions:

- hiding portable pumps in riverine bushes;
- a high level of unrecorded and unlicensed groundwater pumps;
- high '*transmission losses*' noted in Groot Letaba, which are attributed to abstractions (of the 130MCM in the Tzaneen irrigation scheme allocated for irrigation, an allowance for 27MCM is included, 23%)

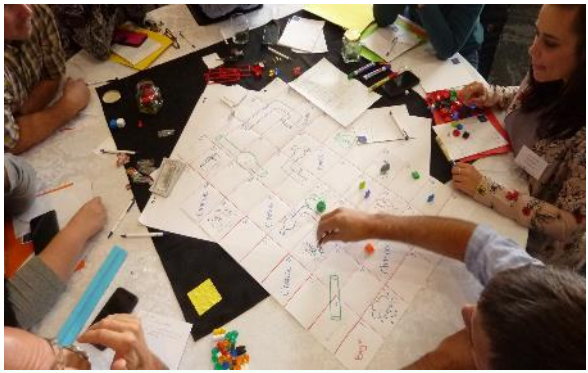
Plus legitimising own *productive* use while externalising problems to other sectors; e.g. blaming wastage in urban areas associated with taps being left open, leaking pipes etc. (Yet how does this compare with a 5% over-irrigation over 10 000 ha of irrigation?).

Echo-chambers

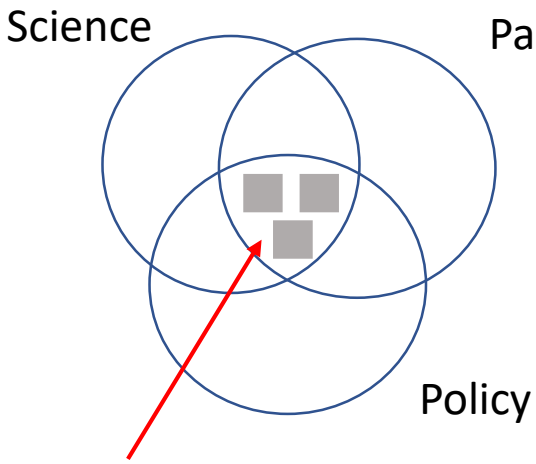
Echo-chambers; dialogue that fails to break the boundaries of the system and/or dialogue-support that insufficiently transforms dialogue

Recent experiences in SA using serious games by our FF&V project highlighted how echo-chambers can remain steadfast despite attempts at opening up understanding & dialogue:

- In one water game a card: “you can sabotage your neighbours irrigation”.
- Games devised by Citrus farmers were focussed on maximising own water and production in the short term, with little long term thinking or for fellow humans in the city (e.g. offhand statement about just shutting of water to Cape Town)

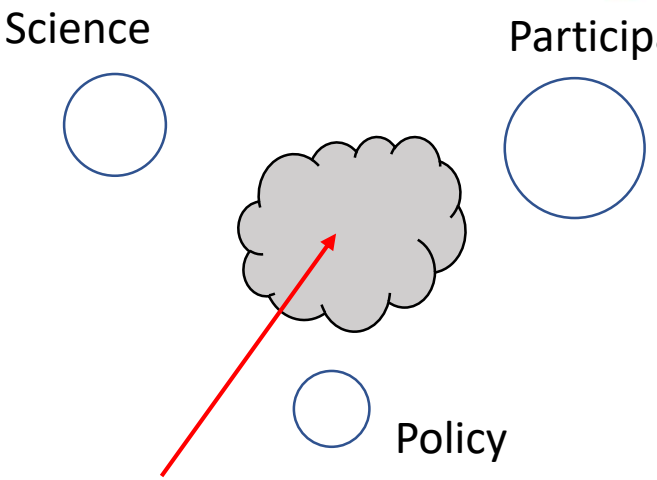


Why lack of managed allocation?



Managed water allocation using three instruments (pricing/markets, licencing and community agreements)

When science, participation and policy are well supported and mutually supportive.



Hidden allocation, legacies, gaps, subterfuge, echo chambers

When science, participation and policy are not 'strong' or interlinking

But science, participation & policy (dealing with wicked problems) in river basins is difficult

Summary

- Water allocation in river basins and aquifers is far from simple and rarely ‘effected purposively’. Allocation is rarely managed directly.
- Instead water allocation appears to be a ‘residual’ both in quantity and in process.
- Water allocation is a cumulative result of ‘hidden allocation’ processes
- Hidden allocation processes: ‘legacies, gaps, subterfuge, echo-chambers’
- Hidden allocation – when science, participation and policy not robustly effected

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Citations

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- Forthcoming with Amy Fallon (paper)