States’ Groundwater Regulations: they bark but do they bite?

François Molle, Alvar Closas
IWMI/IRD
Groundwater ownership

**State**
- Administrate rights/trading
- Define overall constraints and rationing rules (or courts)
- State as owner of resources, or *custodian* (in the name of the people)

- **Private rights (Chile)**
- **Private rights (with land)**
- **Reasonable use**
- **Correlative rights**
- **Customary rights (local regulation)**
- **Colonial settings**
Control the number and expansion of wells

- Licensing wells
- Prohibition zones
- Well spacing
- Backfill illegal wells
- Control drillers
- Buy out wells
- Ban new wells
- Sanctioning
- Do not allow deepening/rep.

Policy objectives

- Revert to rainfed
- Community rules

Deepening/cleaning wells

- Artificial recharge (injection)
- Water harvesting structures
- Bring substitute surface water or treated/desal water

Manage supply

Control abstraction by existing wells

- Subsidize micro irrigation (& control expansion)
- Awareness raising
- Water pricing
- Micro-irrigation
- Change crops
- Collective rules
- Imposing quotas (per ha, per well)
- Input or output subsidies
- Control electricity grid
- Restrict crop type
- Sanctioning

Community rules

- Do not allow deepening/rep.
1. The state and the control of the number of wells

**Authorizations**

- Drilling
  - Exempt
    - *depth
    - *use
    - *vol.
    - *manual
  - File
    - *XY
    - *purpose
    - *volume
    - *area
    - *tech.
    - *etc
- Abstraction
  - License for use
  - Temporary authorization
- Modifications
  - *depth
  - *clean
  - *replace
- Existing wells
  - Regularization of existing wells
  - Temporary authorizations
  - validation
  - What if the area is overexploited?
- Well remains illegal
Regularization of existing wells

- Known/legal
  - Regularized (meter/conditions?)

- Known/illegal
  - Wells before Law to be regularized
  - New deadline given...
  - New deadline given, wells before new date...
  - etc....

- Unknown/illegal
  - Regularized
  - Authorization
  - Illegal

Reluctance:
- Have to pay
- Put meter
- Fear charges
- Will have restrictions

Authorization:
- Verify claims on the ground
- Put meters
- What if the area is overexploited (hydrology,..)
- Huge logistic problems
- Political pressures
- Court cases (justice)
Spain: 1985-1988 regularization period: 15% of ‘success’ extended 2001. Nearly 40,000 wells exist in the Western Mancha aquifer of which only 17,000 had been registered at the Guadiana River Basin Authority in 2008 (Martinez-Santos et al.)

South-Africa: 1998 regularization period; Only 20% of applications processed in 2012; Permits distributed in only two basins; overallocation of water


France: Roussillon Aquifer (south of France); only 10-20 of wells being dug are officially declared (Montginoul et Rinaudo)
Regularization often leads to over-allocation of permits (and to the realization that the resource is already over-allocated)

Australia, South Africa, Chile, Mexico, Spain, US...
Controlling the existing number of wells

- Prohibition zones
- Backfill illegal wells
- Do not allow deepening/maintenance/transfer
- Buy back the wells (or the corresponding right)
- Control drilling companies
- Ban on new wells
- Heavy sanctions for wrongdoers
Control the number and expansion of wells

- Licensing wells
- Prohibition zones
- Well spacing
- Backfill illegal wells
- Control drillers
- Buy out wells
- Ban new wells
- Sanctioning

Control abstraction by existing wells

- Subsidize micro irrigation (& control expansion)
- Awareness raising
- Micro-irrigation
- Change crops
- Collective rules
- Revert to rainfed

Policy objectives

- Deepening/cleaning wells
- Water harvesting
- Artificial recharge (injection)
- Water harvesting structures
- Bring substitute surface water or treated/desal water

Manage supply

- Input or output subsidies
- Restrict crop type
- Impose quotas (per ha, per well)
- Control electricity grid
- Water pricing
- Awareness raising
- Subsidize micro irrigation

Community rules

- Revert to rainfed
State control: with or without teeth?

- Licensing
- Metering
- Pricing
- Well spacing
- Quotas
- Drip irrigation

- Illegal drilling, corruption
- Meter broken/tampered with/bypassed
- Fees not recovered/bribes
- Inadequate; control weak
- Penalties not applied; costly and hard to monitor
- Expand the area

Why is enforcement so difficult?

Why is political will lacking?
## Regulation exists, but where is the enforcement??

<table>
<thead>
<tr>
<th></th>
<th>Well licensing (permits)</th>
<th>Metering</th>
<th>Volumetric pricing (tariffs)</th>
<th>Abstraction quotas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Algeria</td>
<td>Yes (1999)</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Bahrain</td>
<td>Yes (1980)</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Egypt</td>
<td>Yes (1984)</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Lebanon</td>
<td>Yes (1926)</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Oman</td>
<td>Yes (1990)</td>
<td>Yes (1990)</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Saudi Arabia</td>
<td>Yes (1989)</td>
<td>-</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Syria</td>
<td>Yes (1958)</td>
<td>Yes (2000)</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Tunisia</td>
<td>Yes (1975)</td>
<td>No</td>
<td>Yes</td>
<td>Yes (2000)</td>
</tr>
<tr>
<td>Abu Dhabi (UAE)</td>
<td>Yes (2006)</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Yemen</td>
<td>Yes (1998)</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

“In my country we have excellent water laws but the problem is implementation and enforcement”
Failure of state regulation

- Number of groundwater users
India
Small plots and holders, complex land tenure

Texas
Large and well identified farms and owners
Failure of state regulation

- Number of groundwater users
- Lack of staff and budget for groundwater administration
- Monitoring on the ground and enforcement too costly
- The problem is invisible; changes are sometimes slow; aquifers may recover
- Policy dilemma: poverty alleviation, livelihoods, social problems vs restrict wells and use
- Short term political mandates and interests vs tough decisions (only in crisis time)
- Agriculture-Water policy contradictions
- Some powerful (agricultural) investors are also pumping
Failure of state regulation

- Number of groundwater users
- Lack of staff and budget for groundwater administration
- Monitoring on the ground and enforcement too costly
- The problem is invisible; changes are sometimes slow; aquifers may recover
- Policy dilemma: poverty alleviation, livelihoods, social problems vs restrict wells and use
- Short term political mandates and interests vs tough decisions (only in crisis time)
- Agriculture-Water policy contradictions
- Some powerful (agricultural) investors are also pumping

In sum: logistic/practical problems and lack of political will
Regulations may "bite the boot" but State power should not be overstated in such a complex issue.

The temptation for the state is to harden sanctions but this may turn them non-credible.

France: the non-declaration of a well can represent a fine of 15,000 Euros.
*Elinor Ostrom (2000):*

The worst of all worlds may be one where external authorities impose rules but are only able to achieve weak monitoring and sanctioning.

Unrealistic reforms *not only fail*: they damage trust and state authority and make further efforts less likely to succeed.

*When ideology creeps in:*

Water ‘rights’ reforms are often intended out of unqualified application of ‘best practices’, with little understanding of contexts, hydrology and complexity, and possible equity impacts.
Boelens et al. (2002):
It is an instrumental myth to assume that the intended changes in water management can be made only by formulating and legislating official rules.
Country’s water context

Annual renewable resources

GW
exploited

SW
exploited

Agriculture
Thank you for your attention