INSTITUTIONS AND INSTITUTIONAL DESIGN
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Part XI: Design principles II

NTNU, Trondheim
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This lecture is based on

- Ch. 3-5 in Ostrom, Elinor 1990 "**Governing the Commons. The Evolution of Institutions for Collective Action**", Cambridge, Cambridge University Press,

Recapitulation

Design principles suggested by Goodin

- Revisability: limiting manipulation
- Robustness: only the right adaptability
- Sensitivity to motivational complexity
- Publicity: legitimization, limiting opportunism
- Variability: increasing adaptability

Ch 3 Long enduring, self-organized, self-governed CPRs

- The problem of commitment
  - High level of temptation to free-ride
- The problem of monitoring
  - Appropriators play a major role
  - Commitment and monitoring strategically linked, monitoring producing private benefits as well as joint benefits for others
- Switzerland, Japan, Spain, Philippines

Törbel, Switzerland

- Private arable, common grazing and forest
- Land held in common are
  - Low production value per unit
  - Frequency or dependability of use or yield is low
  - Possibility of improvement or intensification low
  - Effective use require a large territory
  - Large groups needed for capital-investment activities
- All decisions are taken by the appropriators

3 villages in Japan

- Similar to Switzerland
- Rights held by kumi, a group of households
- Decisions by village authorities
- Monitoring and sanctioning
  - Entry only at specified times
  - Daily patrols on horse
  - Graduated sanction, part to the patrol

Huerta irrigation institutions (1)

Valencia

- Bylaws from May 29, 1435, but many customary rules from before the reconquest in 1238 were incorporated
- Water rights belong to the land being irrigated before the reconquest, proportional to size, "turno" system
- Weekly water court centuries old, maybe from Islamic time (key actors: syndics, ditch-riders, irrigators, their executive committee, water court; organised per canal)

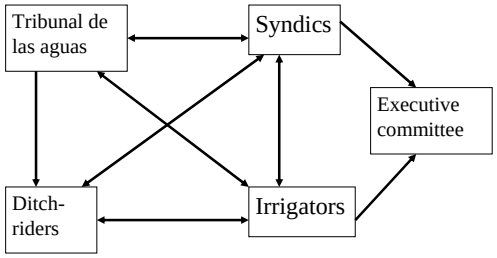


Figure 3.2 Patterns of monitoring and accountability among key actors in the Valencia huerta (Ostrom 1990:74)

Huerta irrigation institutions (2)

Murcia and Orihuela

- Less and more erratic rain than Valencia
- "tanda" system
- Employ guards from the local communities
- Murcia: Weekly water courts similar to V.
- Orihuela: single judge

Huerta irrigation institutions (3)

Alicante

- "tanda" system, market in old water rights. "scrip"
- dam of 1594, market in new water rights limited to those who paid for the dam construction
- Expenses of the irrigation community paid by auctioning a quantity of water allocated to this purpose in 1926
- Organisation: must own a min. of land to participate
- Dam in gov. control 1739-1840 + civil war 1930-1959, since 1950 again in farmer control

Zanjeras of the Philippines

- Zanjera: irrigation society
- Like in Spain: small communities of irrigators determine their own rules, choose their own officials, guard their own systems, and maintain their own canals
- A zanjera may contract for use rights to a share of the land they irrigate by their construction
- Low tech dams destroyed by monsoon requires extensive work, up to 2 months per person per year
- Water allocation not as "efficient" as it could be

Long enduring institutions

- Complex and uncertain environments
- Stable populations of basically equal individuals with common history and shared norms
- Sustainable robust institutions: why?
  - Operational rules vary
- 7 design principles that will affect incentives in such a way that appropriators will be willing to commit themselves to conform to operational rules devised in such systems, to monitor each other's conformance, and to replicate the CPR institutions across generational boundaries.

Design principles 1-3

1. Clearly defined boundaries.
2. Congruence between appropriation and provision rules and local conditions.
3. Collective-choice arrangements

Design principles 4 -7 + 8

- 4. Monitoring
- 5. Graduated sanctions
- 6. Conflict resolution mechanism
- 7. Minimal recognition of rights to organise

CPR's that are parts of larger systems

- 8. Nested enterprises

Ch 4 Supply of institutions

- First order collective action problem: changing behaviour to protect a resource
- Second order collective action problem: devising rules that can change behaviour
- Longitudinal study of ground water basins beneath the Los Angeles metropolitan area

Supply of institutions (1)

Groundwater basins in California

- Structure of rights results in open access
  - Overlying landowners and appropriators
  - Start and continuity of use
  - Beneficial use and surplus water
  - Adverse possession, seniority
- Uncertainty about volume available and the rate of withdrawal by other water pumpers

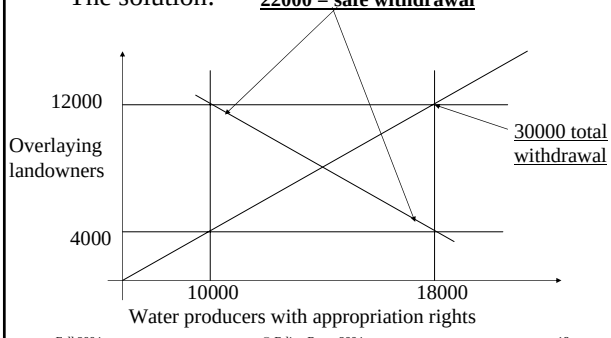
Supply of institutions (2)

The litigation game:

- Unsustainable withdrawal, no one wanted to cooperate, case brought to court, referred to the division of water resources determining safe withdrawal and current levels
- If the parties now did not reach an agreement the judge would decide for them
- Voluntary solution based on mutual prescription and proportional cutback, upheld by courts

Supply of institutions (3)

- The solution:



Public entrepreneurship

Problems:
- Getting all to cut back on withdrawal
- Salt water intrusion must be stopped
- Boundaries between ground water basins determined

No court district covered the area

Agencies meet to draft needed legislation for
  - Reporting water withdrawal
  - Forming replenishment districts

System of governance

Polycentric public-enterprise
- West and Central Water Replenishment District
  - Based on water producer associations
- Metropolitan Water District (long distance supply)
- Los Angeles County Sanitation District (alternate supp)
- Los Angeles County Flood Control District (operation)
- California Department of Water Resources
  - Water master services

Ch 5 Institutional failures

- Fishers of Turkey fails to develop rules
- Groundwater of San Bernardino county is not protected
- Rules of Sri Lankan fishers are not recognized
- Sri Lankan irrigation systems work poorly
- Inshore fisheries of Canada do not respond to global national regulations

Analysing institutional change

- Creating vs. changing institutions
  - not so different
- All situations have default conditions
- Rules: forbid, require, permit
  - The Hobbesian condition: all is permitted
- Sequences of small low cost transformations each changing the incentives and behaviours

Rent dissipation in fisheries

Bodrum and Bay of Izmir

- Large heterogeneous group of fishers
- Restrictions on 3-mile no-trawl zone not enforced in Bodrum
- No restriction on new entrants
- Any rule of restriction would favour some group more than others
- No arena where low-cost enforceable agreements can be reached

Top down solution of a complex problem fails

Water rights in San Bernardino County

- Large diverse water system with as diverse interests
- Mojave Water Agency to purchase surface water
- Tries to use MWA to resolve local problems after the model from West and Central in LA county
- After 8 years of litigation it is given up

Failure of a Sri Lankan fishery

Beach seine fishery in Mawelle

- Well developed sequencing of nets
- Efforts to limit the number of nets failed
  - Legal limit introduced in 1933 (32 nets)
  - Population growth and new markets increased pressure
  - Local entrepreneurs persuaded law enforcers to be passive
  - Local efforts to exclude at 84 nets were stopped by police
  - By 1966 the number of nets was 108
- Failure because of state activity and intervention on behalf of local free-riders

Irrigation in Sri Lanka

Kirindi Oya and Gal Oya

- Central power (bureaucratic, political decisions about water allocations. Maintenance neglected
- Incentives of farmers and of officials moves from inconsistent to perverse. No local organisations
- Gal Oya left bank experiment introduce “Institutional Organisers” as catalysts, fairly successfully overcoming local internal mistrust and local-central mistrust in organising local farmers and maintenance work

Canadian fragile fishery institutions

Nova Scotia Inshore fisheries

- Local rules about zoning and technology
- Local enforcement not centrally acknowledged
- Offshore open access requiring regulations, such as registration and licensing of fishing vessels
- Central government trying to make one regulation to fit all circumstances, making locally devised and enforced rules fragile

Lessons to be learned

- In fragile institutions (Alenya, Gal Oya, Port Lameron) 3-5 of the principles are at work
- In failed institutions (Bodrum, Bay of Izmir, Mawell, Kirindi Oya, Raymond, West & Central Basins (earlier), Mojave) 0-3 of the principles are at work
- In success stories all 7-8 are at work

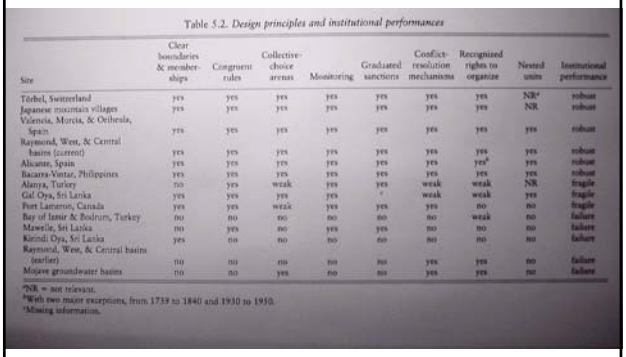


Table 5.2. *Design principles and institutional performances*

Site	Clear boundaries & member-ships	Congruent rules	Collective-choice arenas	Monitoring	Graduated sanctions	Conflict-resolution mechanisms	Recognized rights to organize	Nested units	Institutional performance
Törbel, Switzerland	yes	yes	yes	yes	yes	yes	yes	NR[a]	robust
Japanese mountain villages	yes	yes	yes	yes	yes	yes	yes	NR	robust
Valencia, Murcia, & Orihuela, Spain	yes	yes	yes	yes	yes	yes	yes	yes	robust
Raymond, West, & Central basins (current)	yes	yes	yes	yes	yes	yes	yes	yes	robust
Alicante, Spain	yes	yes	yes	yes	yes	yes	yes[b]	yes	robust
Bacarra-Vintar, Philippines	yes	yes	yes	yes	yes	yes	yes	yes	robust
Alanya, Turkey	no	yes	weak	yes	yes	weak	weak	NR	fragile
Gal Oya, Sri Lanka	yes	yes	yes	yes	[c]	weak	weak	yes	fragile
Port Lameron, Canada	yes	yes	weak	yes	yes	yes	no	no	fragile
Bay of Izmir & Bodrum, Turkey	no	no	no	no	no	no	weak	no	failure
Mawelle, Sri Lanka	no	yes	no	yes	yes	no	no	no	failure
Kirindi Oya, Sri Lanka	yes	no	no	no	no	no	no	no	failure
Raymond, West, & Central basins (earlier)	no	no	no	no	no	yes	yes	no	failure
Mojave groundwater basins	no	no	yes	no	no	yes	yes	no	failure

[a]NR = not relevant.
[b]With two major exceptions, from 1739 to 1840 and 1930 to 1950.
[c]Missing information.

Important conclusions so far

Making new legislation requires:

- respect for what we may call customary rights and duties in relation to nature,
- a clear perspective on what we may call collective rationality,
- a focus on shaping legitimate decision processes and just outcomes rather than fixed states of environmental quality.