

# INSTITUTIONS AND INSTITUTIONAL DESIGN

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### Part XI: Design principles II

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Literature:

Chapters 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

Learning from variability: Ostroms studies of self-governed resource management institutions.

# 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

Long endurance – 100 to more than 1000 years

The long time should have given the communities opportunity to “discover” some underlying principles of good institutional design in a CPR environment. But not OPTIMAL. Optimal is not a good criterion for judging long enduring institutions. Perhaps adaptive efficiency is.

Commons have not disappeared despite the communities having long experience with both private and common property.

# 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

Main reference: Robert McC. Netting 1981 Balancing on an Alp

Authority rules to limit appropriation levels: proportional allocation based on e.g. winterfed animals, amount of meadowland, actual amount of hay production, value of land owned, number of shares owned in a cooperative. A few villages allows each citizen an equal number of animals on the summer pastures.

Cow rights – wintering rule

Inheritance of private property – equally, implies access to commons, but females upon marriage cannot inherit rights in the commons, and only owners of private property can do so. Hence appropriation rights and provision duties are inherited by individual males who own private property in the village and remains citizen of the village.

# 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

Main reference Margaret McKean 1986, 1982

# 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)

“turno” system: fixed order of rotation, each takes as much as he needs as long as it is not wasted

Patterns of monitoring and accountability among key actors along one canal (out of 7):

Tribunal de las aguas <.....> Syndics

..... Executive committee

Ditch-riders <.....> Irrigators

# 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

“tanda” system - fixed time period where water can be withdrawn, do not know how much water there is

# 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, since 1950 again in farmer control

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Ostrom (1990:81) “It should be noted that the degree of freedom to devise and change their own institutions, successfully asserted by the irrigators of eastern Spain, was not typical of the Castilian part of Spain, whose far more centralized institutions were the major influences on the evolution of Spanish national institutions.”

Castile more centralised than Aragon (Valencia, Aragon and Catalonia)  
Spain and Latin America modelled on Castile

Alicante more efficient than Murcia and Orihuela which are more efficient than Valencia.



# Zanjas 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

But the zanjas surveyed had delivered both water to its members and raised an extraordinary amount of labour to maintain the system. There are more costs to keeping an organisation going than the crop foregone by less than maximum efficiency in water allocation.

# 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.

People in stable populations will be interested in their reputation, and tend to have low discount rates

# Design principles 1-3

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

1. Clearly defined boundaries. Individuals or households who have rights to withdraw resource units from the CPR must be clearly defined, as must the boundaries of the CPR itself.
2. Congruence between appropriation and provision rules and local conditions. Appropriation rules restricting time, place, technology, and/or quantity of resource units are related to local conditions and to provision rules requiring labour, material, and/ or money.
3. Collective-choice arrangements. Most individuals affected by the operational rules can participate in modifying operational rules.

# 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

4. Monitoring. Monitors, who actively audit CPR conditions and appropriator behaviour, are accountable to the appropriators
5. Graduated sanctions. Appropriators who violate operational rules are likely to be assessed graduated sanctions (depending on the seriousness and context of the offence) by other appropriators, by officials accountable to the appropriators, or by both.
6. Conflict resolution mechanism. Appropriators and their officials have rapid access to low-cost local arenas to resolve conflicts among appropriators or between appropriators and officials.
7. Minimal recognition of rights to organise. The rights of appropriators to devise their own institutions are not challenged by external governmental authorities.

For CPR's that are parts of larger systems

8. Nested enterprises. Appropriation, provision, monitoring, enforcement, conflict resolution, and governance activities are organised in multiple layers of nested enterprises.

# Ch 4 Supply of institutions

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

Based on Elinor Ostrom's dissertation work (Ostrom 1965), done in team with Louis Weschler (Weschler 1968), and updated by William Blomquist's dissertation work (Blomquist 1992) directed by Ostrom.

**Blomquist, William 1992 *Dividing the Waters. Governing Groundwater in Southern California*, ICS Press, Oakland,**

**Ostrom 1965 and Weschler 1968 see references in Ostrom 1990**

# 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

See

Blomquist, William 1992 "Dividing the Waters. Governing Groundwater in Southern California.", ICS Press, San Francisco

# 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

# 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

The emergence of these public institutions have created fully marketable water rights, but also a publicly governed system of groundwater basins. Governed by the appropriators and aided by the local authorities. The design principles discussed previously can be seen the have applied in practice, also here.

Ostrom (1990:139) “In other words, the rules for engaging in micro-constitutional choice related to the control of groundwater have encouraged investments in self-organisation and the supply of local institutions. A similar set of individuals facing similar problems in an entirely different type of political regime might not be able to supply themselves with transformed micro-institutions. The difference between an active effort by a central government to regulate appropriation and provision activities and an effort to provide arenas and rules for micro-institutional change is frequently blurred.”

# 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

Ostrom (1990:140) “A change in any rule affecting the set of participants, the set of strategies available to participants, the control they have over outcomes, the information they have, or the payoffs is an institutional change.”

# 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

Ostrom (1990:149) "Attempts to solve the difficult problems of this large and complex region primarily on a regional scale using one instrumentality did not enable those involved to devise effective institutional arrangements to address the diverse problems they faced."

# 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

Ostrom (1990:157) "Private ownership may have been the only viable institutional arrangement along this coast, not because it was "the only way" but because the external regime was unwilling to allow local rule determination and enforcement. External intervention to prevent rule enforcement against political favorites undermines the viability of common-property arrangements."

# 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

Ethnic divide between headland and tail land (singalese vs. tamil)

The divide was overcome by the IOs

# 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

Ostrom (1990:173) "Some fragile institutions devised by CPR appropriators are still in use and effective. These institutions exist, however, in a broader setting that renders doubtful their continued use and effectiveness."

Other examples: raft fishers along the coast of Bahia in Brazil have their own limited access tenure system. The government tries to enforce open access.

The Nepalese government had to backtrack on the nationalisation of village forests.



# 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

Alenya, an ingenious rotation system, but no external acknowledgement and no restriction on entry

Gal Oya, building up from below, but basically depending on good will from the officials of the department of irrigation

Port Lameron, local regulation of zoning and technology, but not recognized by the federal government which wants to regulate all fisheries the same.

Table 5.2. *Design principles and institutional performances*

Site	Clear boundaries & memberships	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 <sup>a</sup>	robust
Japanese mountain villages	yes	yes	yes	yes	yes	yes	yes	NR	robust
Valencia, Murcia, & Oriheula, 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 <sup>b</sup>	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	yes	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

<sup>a</sup>NR = not relevant.

<sup>b</sup>With two major exceptions, from 1739 to 1840 and 1930 to 1950.

<sup>c</sup>Missing information.

Port Lameron is fragile: because their rule system is not recognized by the federal government.

Alenya is fragile: they do not address the problem of limiting access. If more individuals want to join in the fishery they might face the problems of Mawell. Besides there is no formal collective choice arena, only the local coffee house.

Gal Oya is fragile: their current status is too dependent on how the bureaucrats of the Irrigation Department interpret their rules.

# 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.