

# **INSTITUTIONS AND INSTITUTIONAL DESIGN**

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## **Part IVb: Collective action**

NTNU, Trondheim

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# Literature

- Ostrom, Elinor 1990 “Governing the Commons. The Evolution of Institutions for Collective Action”, Cambridge, Cambridge University Press,
- North, Douglass C. 1990 “Institutions, Institutional Change and Economic Performance”, Cambridge, Cambridge University Press,
- Peters, B Guy.1999 Institutional Theory in Political Science, London, Continuum

More literature:

Olson, Mancur (1965) “The Logic of Collective Action”, Cambridge, Harvard University Press

# Summary:

## Assuming the collective exist

- Searle: from collective intentionality
  - To institutional facts: “X counts as Y in C”
- Douglas: thought collective, thought world
  - Institutions as “natural things”
  - Providing categories for thinking
  - Defending the “natural” order of the universe by feelings of justice and injustice

If there exist some collective structure affecting our behaviour, then collective action does not seem so strange.

Searle and Douglas both think there is something “collective”. Searle assumes a primitive he calls collective intentionality. Douglas postulates a collective thought style and thought world.

Searle tries to reconstruct what institutional facts means and how they come into being given the collective intentionality.

Douglas tries to understand how the collective ever can get started and survive in a world of scarce goods and selfish instincts. She knows that it does but cannot quite fathom how it got started. Once started she also investigates how it survives by channelling our attention, providing categories for thinking and ideas about justice to control our feelings. The basic informal institutions survive by masking themselves as nature, and by the feelings of justice and injustice they generate if the natural order of the universe is threatened

# Assuming only selfish motives

- How is collective action possible without Leviathan to force cooperation onto us?
- New Institutional Economics (NIE) has a problem in explaining collective action when moral values and ideologies are unstable. NIE needs to internalise ideology.
- Ostrom explains how the collective action problem is different in different situations

The assumption that there exist something “collective” which affects our behaviour the same way for all, has always seemed extremely suspicious to most social scientists, and particularly to economists. The challenge has been to show that collective action is possible, not only with “Leviathan” present, but also without. The problem has been known as long as people have speculated about the conditions of cooperation and conflict. The most famous of the early statements is perhaps Hobbes’ (1651) “Leviathan”: Only the all-powerful state will be able to restrain the selfish activities of people struggling to appropriate scarce resources.

Most recent studies of collective action trace their origin to Mancur Olson’s (1965) “The Logic of Collective Action”. Since then a veritable flood of studies have added small steps towards an understanding that maybe collective action is possible also without a “Leviathan” to force it on people. Eggertsson (1990) provides a summary of this development up to about 1990.

Elinor Ostrom (1990) in her “Governing the Commons” is one of those who have taken our understanding of what the problem consists of a significant step onwards.

## Ostrom 1990:

Three influential models to discuss

1. The tragedy of the commons,
2. The prisoners dilemma, and
3. The logic of collective action

Ostrom's book (1990:2) "is an effort to (1) critique the foundations of policy analysis as applied to many natural resources, (2) present empirical examples of successful and unsuccessful efforts to govern and manage such resources, and (3) begin the effort to develop better intellectual tools to understand the capabilities and limitations of self-governing institutions for regulating many types of resources"

# The unsolved problem

- How do we govern the exploitation of natural resources?
  - Some recommend the state
  - Some recommend privatisation
  - Some communities have successfully managed scarce resources for a long time without either a state or private ownership, relying on other types of institutions: **self-governance**

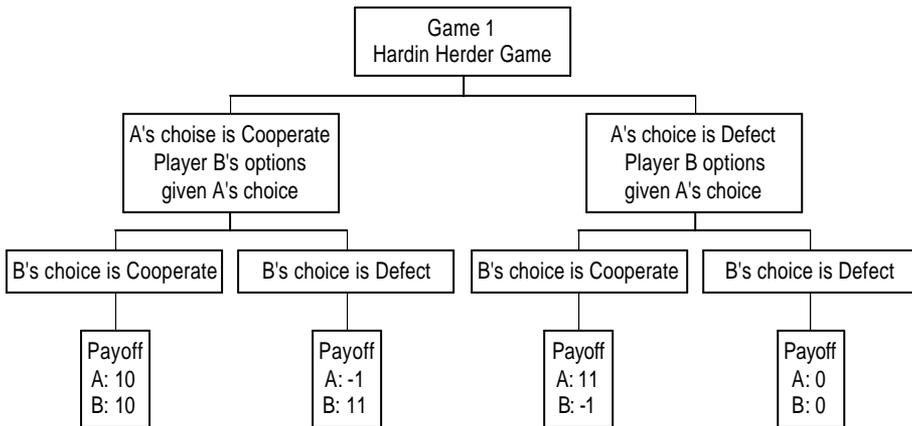
The tragedy of the commons as metaphor. It contains suggestions of two kinds of solution: state control or private property. Ostrom introduces self-governance.

# The state as solution

- The tragedy of the commons
  - Hardin 1968, Aristotle, Hobbes 1651, Foster Lloyd 1833, Scott Gordon 1954, and Dales 1968 all describe the same problem (for references see Ostrom 1990)
- The commons as a PD game

The tragedy of the commons is often analyzed as a prisoners dilemma game.

# Hardin's herder game (Game 1)



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## **The prisoners dilemma:**

Both players has a dominant strategy: defect

But the equilibrium is not Pareto-optimal

Both prefer (cooperate, cooperate) to (defect, defect)

The paradox: individually rational strategies leads to a collectively irrational result

# Interest groups cooperating

- Mancur Olson did not quite believe interest groups (IG) would cooperate as assumed
  - If the collective good is available to all once it is produced, rational actors have little incentive to contribute voluntarily.
  - (but he believed it occurs in small groups and keeps the door open for intermediate size groups: compare Douglas 1986 ch 2-3)

“The logic of collective action”

# Tragedy, Prisoner, Collective Action

- These are powerful models, but also dangerous models if used metaphorically in policy settings
- Model rules do not resemble real world setting in general, only in some particular cases
- Core concept: free riders, commitment, supply of institutions (rules of the game), monitoring

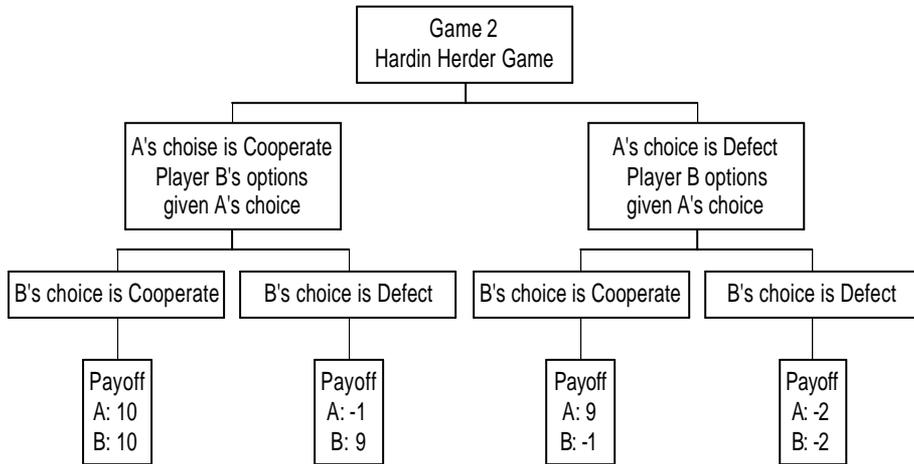
The three models: 1)The tragedy of the commons, 2)The prisoners dilemma, and 3) The logic of collective action

Ostrom(1990:8) “By referring to natural settings as “tragedies of the commons”, “collective action problems”, “prisoner’s dilemmas”, “open-access resources”, or even “common property resources”, the observer frequently wishes to invoke an image of helpless individuals caught in an inexorable process of destroying their own resources.”

The conclusion is usually either that “Leviathan” is the only way out, to save people from themselves, or that the resources have to be privatised to internalise all various costs of resource usage.

We can study the centralised control in modified Hardin herder game.

# Centralised management (game 2)



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## **Prisoners dilemma is solved by a central power imposing sanctions:**

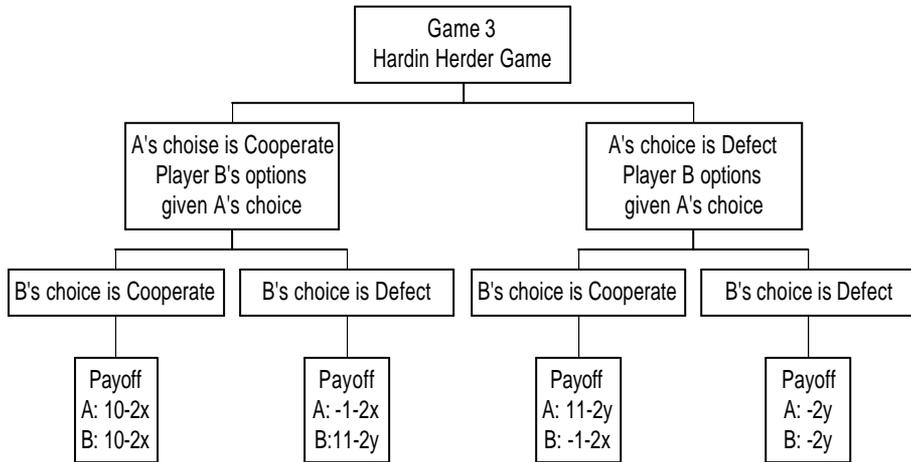
The Leviathan imposes here a penalty of 2 profit units on all players that defect.

The optimal strategy is now (cooperate, cooperate)

Ostrom(1990:10) “The optimal equilibrium strategy achieved by following the advice to centralize control, however, is based on assumptions concerning the accuracy of information, monitoring capabilities, sanctioning reliability, and zero costs of administration.”

What if the central agency has less than complete information? For example about herder strategies?

# Centralised management with incomplete information



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## **Prisoners dilemma returns with a vengeance because the central power do not have perfect information**

$X$  = probability of punishing cooperative behaviour (erroneous response)

$(1-x)$  = probability of not punishing cooperative behaviour

$Y$  = probability of punishing defectors

$(1-Y)$  = probability of not punishing defectors (erroneous response)

With  $X=0$  and  $Y=1$  Game 2 is a special case of game 3

If the agency punishes correctly with probability .7 we are again in a PD game and with an even lower equilibrium than in the unregulated game: (-1.6, -1.6). To avoid pushing the herders into a PD game again the central agency must punish correctly with a probability greater than .75.

Ostrom(1990:22) "Asserting that central regulation is necessary tells us nothing about the way a central agency should be constituted, what authority it should have, how the limits on its authority should be maintained, how it will obtain information, or how its agents should be selected, motivated to do their work, and have their performances monitored and rewarded or sanctioned."

If  $10-2x > 11-2y$  we are not in the PD game. This implies  $-2x > 1-2y$  or  $y > x + 0.5$

If  $y=0.7$  (probability of punishing defectors) we must have  $x < 0.2$  (probability of punishing cooperation) to stay out of the PD game

# Privatisation

- Dividing land into individually owned plots is not costless
  - Fencing costs
  - Erratic rains may necessitate insurance schemes and/ or a market in grazing rights
- Privatisation of non-stationary resources like fish or water is still an unsolved task

Propositions of privatisation or state control as the “only” solution to the commons dilemma cannot both be right.

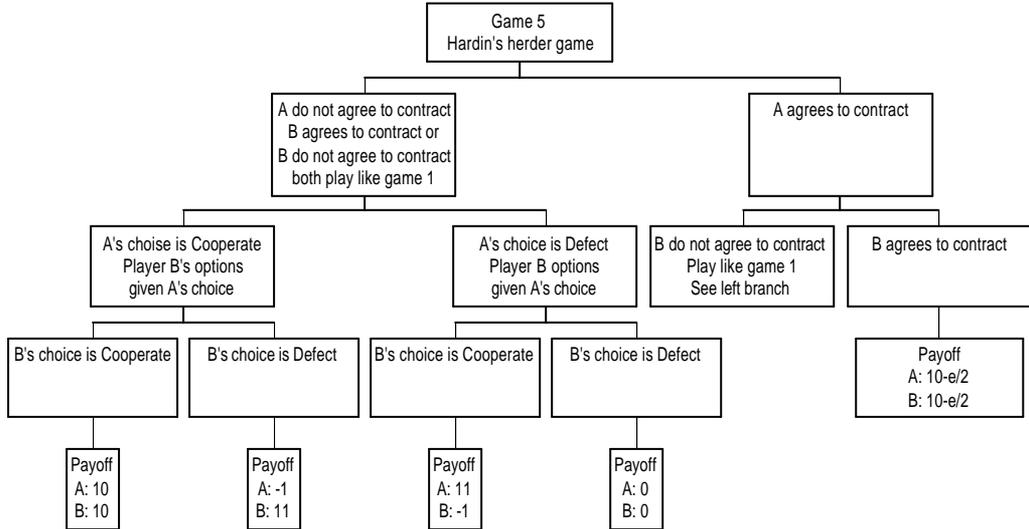
Ostrom(1990:14) “Instead of presuming that optimal institutional solutions can be designed easily and imposed at low cost by external authorities, I argue that “getting the institutions rights” is a difficult , time-consuming, conflict-invoking process.”

Ostrom(1990:14)“instead of presuming that individuals sharing a commons are inevitably caught in a trap from which they cannot escape, I argue that the capacity of individuals to extricate themselves from various types of dilemma situations varies from situation to situation.”

Ostrom(1990:14)“Instead of basing policy on the presumption that the individuals involved are helpless, I wish to learn more from the experience of individuals in field settings. Why have some efforts to solve the commons problems failed, while others have succeeded?”

Ostrom(1990:22) “An assertion that the imposition of private property rights is necessary tells us nothing about how that bundle of rights is to be defined, how the various attributes of the goods involved will be measured, who will pay for the costs of excluding non-owners from access, how conflicts over rights will be adjudicated, or how the residual interests of rights holders in the resource system itself will be organised.”

# An alternative solution



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**SELFGOVERNANCE IS ONE ALTERNATIVE SOLUTION:** A negotiated contract between the herders.

The cost of enforcement is  $e$ . Equal sharing is the only feasible solution.

If both do not agree they are sure that the worst they can do is getting the (0,0) payoff from the original game.

By contributing  $e$  they can now for example hire an external, private, enforcer, or they can do it themselves.

An empirical example: The Alanya inshore fisheries in Turkey. (see page 19-21 in Ostrom 1990)

# Self-organisation and self-governance

- “The central question in this study is how a group of principals who are in an interdependent situation can organise and govern themselves to obtain continuing joint benefit when all face the temptation to free ride, shirk, or otherwise act opportunistically.” (Ostrom 1990, p.29)
- It is still a theoretical puzzle.

# Classification of goods

	Appropriator is Excludable	Appropriator is Non-excludable
Rivalry in appropriation	Private Goods	Common Pool Goods
Non-rivalry in appropriation	Club Goods	Public goods

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Instead of rivalry one may talk of jointness in use, or non-jointness in use. Non-rivalry corresponds to jointness.

See also Ostrom and Schlager 1996 in Hanna et al 1996.

# Rational appropriators

- Complex and uncertain situations
  - Choice of action depends on how the individual learns about, views, and weighs the benefits and costs of actions and their perceived linkages to outcomes that also involve a mixture of benefits and costs.
- Discount rates
- Norms of behaviour

Ostrom (1990:35) “Norms of behaviour reflects valuations that individuals place on actions or strategies in and of themselves, not as they are connected to immediate consequences.”

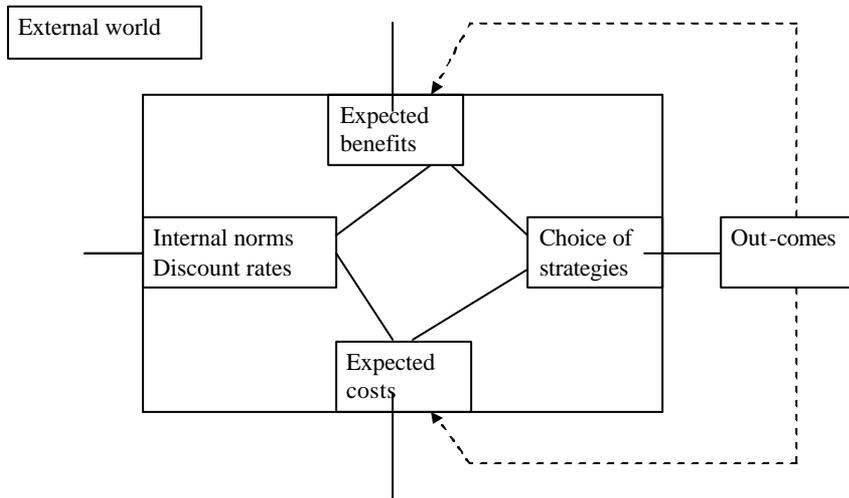
Opportunism is defined as “self-interest with guile”.

Ostrom(1990:36) “In every group there will be individuals who will ignore norms and act opportunistically when given a chance. There are also situations in which the potential benefits will be so high that even strongly committed individuals will break norms.

Consequently, the adoption of norms of behaviour will not reduce opportunistic behaviour to zero. Opportunistic behaviour is a possibility that must be dealt with by all appropriators trying to solve CPR problems.”

Ostrom(1990:36) “Because CPR settings extend over time, and individuals adopt internal norms, it is possible for individuals to utilize contingent strategies, not only independent strategies, in relating to one another.”

## Figure 2.1 The internal world of individual choice



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Ostrom(1990:38) “In complex situations involving unstructured problems, assuming complete preference functions of any shape is not meaningful. The most one can say is that individuals in such situations are engaged in a trial-and-error effort to learn more about the results of their actions so that they can evaluate benefits and costs more effectively over time.”

# Interdependence (1)

- Changing from independent action to coordinated action
  - The firm
    - Entrepreneur recognize interdependence and negotiate contracts for coordinated behaviour (interdependent production function) or
    - Entrepreneur recognize savings from large transaction costs in contacts negotiated in the market for independent producers

Ostrom(1990:41) “In both the theory of the firm and the theory of the state, the burden of organizing collective action is undertaken by one individual, whose returns are directly related to the surplus generated. Both involve an outsider taking primary responsibility for supplying the needed changes in institutional rules to coordinate activities.”

Because both the ruler and the entrepreneur keep the residual of the profits from the organised activities, they can make credible commitments to punish those breaking the agreed rules. But to detect non-compliance they need to institute monitoring.

# Interdependence (2)

## – The state

- Ruler recognize need for protection and sell protection by instituting a monopoly on power. His subjects save substantially on individual protection and will be willing to be taxed for a portion of the savings.
- The monopoly on force can be used to coerce people into further organised behaviour. If the organisation is tailored to the “needs of the people” they will prosper and the tax base increases

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Comments on coordination and interdependence:

A key problem in the origin of institutions is the development of language. Once language exist there are common, shared categories of thought, and Mary Douglas' first cycle can start.

As the number of institutions increase they create a meshwork in de Landa's sense, probably with meshwork externalities in the form of generalized abilities for creating new institutions. But this works only in so far as language is able to keep up on the integration of various institutions

### **A meshwork defines a self sustaining dynamics**

Catalyst's lock-in property makes it “mesh” with its key target changing the target's properties to become receptive to a third substance. The product of this reaction may serve as catalyst in another process producing the catalyst for the first.

**Auto-catalytic loops** link a series of mutually stimulating pairs into a structure that reproduces as a whole

Catalyst C1 mesh with substance A making the reaction AB produce catalyst C2

Catalyst C2 mesh with substance C making the reaction CD produce catalyst C1

The word meshwork is taken from Stuart Kauffman (1990) “Lectures in Complex Systems” eds. Lynn Nadel and Daniel Stein, Redwood City, CA, Addison-Wesley, 1991

Language in legislation: reveal values, structure activities,

# Theory of self-organisation (1)

- Problems of **Open access CPR**: rent dissipation
- Problems of **Limited access CPR**: incentives depends on rules governing
  - Quantity,
  - Timing,
  - Location, and
  - Technology of appropriation. And how these are
    - Monitored and Enforced.

In limited access situations, however, there an incentive to over-invest in any input factor not constrained under current rules sometimes leading to the second order tragedy.

# Theory of self-organisation (2)

## Unsolved problems

- Supply of institutions
  - First order dilemma: A set of rules will satisfy the “demand” for coordinated behaviour. But how do you provide rules? They are also a public good (Second order dilemma).
- Credible commitments
  - Without resort to the external enforcer. How?

Ostrom(1990:44) “a self-organised group must solve the commitment problem without an external enforcer. They have to motivate themselves (or their agents) to monitor activities and be willing to impose sanctions to keep performance high.”

Ostrom(1990:46) “1. Appropriators in CPR situations face a variety of appropriation and provision problems whose structures vary from one setting to another, depending on the values of underlying parameters.

2. Appropriators must switch back and forth across arenas and levels of analysis.”

# Theory of self-organisation (3)

## Unsolved problems

- Monitoring
  - Mutual monitoring and sanctioning is a collective action problem. Sanctioning is almost always costly to the punisher. Benefits accrue to all. Why no free ride?
- The problem of self-organisation unravels from both ends. Yet, it has been done!

A second type of appropriation problem occurs in relation to **assignment of spatial and temporal access** to the resource.

Ostrom(1990:49) “The particular rules used to regulate appropriation will affect monitoring and policing costs and the type of strategic behaviour that will occur between appropriators and monitors (the detection/ deterrence game).”

The provision problems are related to the construction and maintenance of the resource.

Without solving the appropriation problem the provision (maintenance) problem is unsolvable.

With appropriation problems solved it is similar to providing a continuing public good.

Also among the provision problems is the requirement that withdrawal rates do not affect the future ability of the resource system to produce resource units.

**FIGURE 2.2 LINKAGES AMONG RULES AND LEVELS OF ANALYSIS (Ostrom 1990:53)**

<b>Rules</b>	<b>Constitutional</b>	<b>Collective</b>	<b>Operational</b>
<b>Level of analysis</b>	<b>Constitutional choice</b>	<b>Collective choice</b>	<b>Operational choice</b>
<b>Processes</b>	Formulation Governance Adjudication Modification	Policy-making Management Adjudication	Appropriation Provision Monitoring Enforcement

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Ostrom(1990:51) ““Institutions” can be defined as the set of working rules that are used to determine who is eligible to make decision in some arena, what actions are allowed or constrained, what aggregation rules will be used, what procedures must be followed, what information must or must not be provided, and what payoffs will be assigned to individuals dependent on their actions.”

Ostrom(1990:52) “1. Changes in the rules used to order action at one level occur within a currently fixed set of rules at a deeper level.

2. Changes in the deeper-level rules usually are more difficult and more costly to accomplish, thus increasing the stability of mutual expectations among individuals interacting according to a set of rules.”

Figure 2.3 Relationships of formal and informal collective-choice arenas and CPR operational rules

