

Tragedy of the commons

Guest lecture in the course
“The Global Economy –
Environment, Development
and Globalisation”



Nanda Wijermans

Stockholm Resilience Centre
Sustainability Science for Biosphere Stewardship



**Stockholm
University**

Content

- Tragedy of the commons
- Short history
- Important definitions
- Solutions
- Examples of tragedies/drama
- Current challenges

More than 50 years ago ...

- Garrett Hardin published his influential paper:
‘The Tragedy of the Commons’
- This paper is in the top 5 of all research outputs ever (in [Altmetric](#))

This is where our story today begins....

Tragedy of the Commons (Hardin 1968)



Source: medium.com

“Picture a pasture open to all. [...] the rational herdsman concludes that the only sensible course for him to pursue is to add another animal to his herd. And another; and another... But this is the conclusion reached by each and every rational herdsman sharing a commons.

Therein is the tragedy. Each man is locked into a system that compels him to increase his herd without limit - in a world that is limited.” [With the consequence of over-exploited commons]

Solution: Privatisation or state control

From the Tragedy to the Drama of the Commons



Source: medium.com



Source: Economist.com

[Elinor Ostrom on the Myth of Tragedy of the Commons \(Video; 2:38 min\)](#)

From the Tragedy to the Drama of the Commons

- Overexploitation is avoidable! There is not necessarily a tragedy. But there are settings in which Hardin is correct.
- Privatisation and state ownership are not the only solutions.
- Collective self-governance can avoid a tragedy..

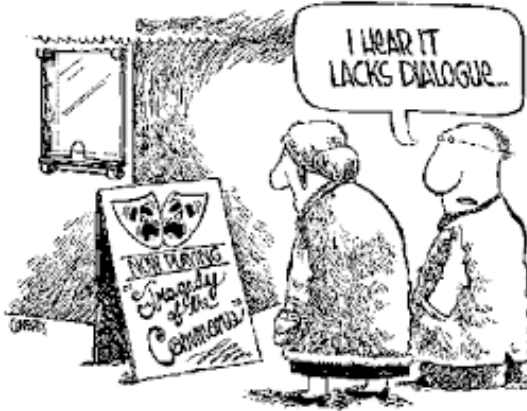


“In efforts to move beyond Hardin, it is important that one does not dismiss his predictions for some CPRs. The major problem of his original analysis was that he presented **‘the tragedy’ as a universal phenomenon**. [...] Overharvesting frequently occurs when resource users are totally **anonymous**, do not have a foundation of **trust** and **reciprocity**, cannot **communicate**, and have no established **rules**” (Basurto and Ostrom 2009).

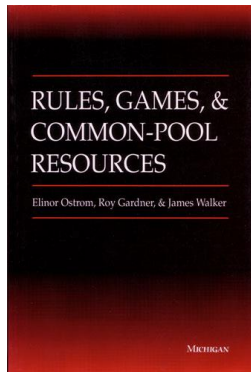


7

... to the Drama of the Commons



1994



Experiment participants fit behaviour predicted by Hardin when:

- group members are **anonymous**
- **no feedback** on individual actions
- **no communication**

Introduction of communication or punishment reduces 'tragedy cases' drastically (through **trust** and **reciprocity**)

- Large groups make it harder to avoid tragedy

(Ostrom et al. 1994, Basurto and Ostrom 2009)

... to the Drama of the Commons

A Behavioral Approach to the Rational Choice Theory of Collective Action
 Presidential Address, American Political Science Association, 1997
 ELINOR OSTROM *Indiana University*

Extensive empirical evidence and theoretical developments in multiple disciplines stimulate a need to expand the range of rational choice models to be used as a foundation for the study of social dilemmas and collective action. After an introduction to the problem of overcoming social dilemmas through collective action, the remainder of this article is divided into six sections. The first briefly reviews the theoretical predictions of currently accepted rational choice theory related to social dilemmas. The second section summarizes the challenges to the sole reliance on a complex model of rationality presented by extensive experimental research. In the third section, I discuss two major empirical findings that begin to show how individuals achieve results that are "better than rational" by building conditions where reciprocity, reputation, and trust can help to overcome the strong temptations of short-run self-interest. The fourth section raises the possibility of developing second-generation models of rationality, the fifth section develops an initial theoretical scenario, and the final section concludes by examining the implications of placing reciprocity, reputation, and trust at the core of an empirically tested, behavioral theory of collective action.

Let me start with a provocative statement. You would not be reading this article if it were not for some of our ancestors learning how to undertake collective action to solve social dilemmas. Successive generations have added to the stock of everyday knowledge about how to instill productive norms of behavior in their children and to craft rules to support collective action that produces public goods and avoids "tragedies of the commons."¹ What our ancestors and contemporaries have learned about engaging in collective action for mutual defense, child rearing, and survival is not, however, understood or explained by the extant theory of collective action.

we are hand-waving at our central questions. I am afraid that we do a lot of hand-waving. The lessons of effective collective action are not simple—it is obvious from human history and the immense tragedies that humans have endured, as well as the successes we have realized. As global relationships become even more intricately intertwined and complex, however, our survival becomes more dependent on empirically grounded scientific understanding. We have not yet developed a *behavioral theory of collective action* based on models of the individual consistent with empirical evidence about how individuals make decisions in social-dilemma situations. A

Implications for Policy

(Excerpt from Ostrom 1998)

Using a broader theory of rationality leads to potentially different views of the state. If one sees individuals as helpless, then the state is the essential external authority that must solve social dilemmas for everyone. If, however, one assumes individuals can draw on heuristics and norms to solve some problems and create new structural arrangements to solve others, then the image of what a national government might do is somewhat different.

1994

1998

RULES, GAMES, & COMMON-POOL RESOURCES

Elinor Ostrom, Roy Gardner, & James Walker

MICHIGAN

... to the Drama of the Commons

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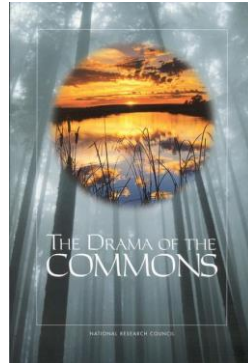
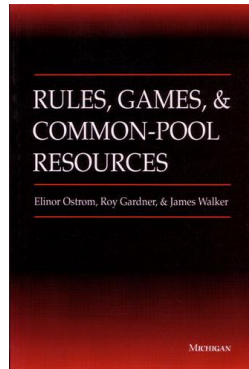
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Description of the publisher:

“[The "tragedy of the commons"] has had tremendous value for stimulating research, but it only describes the reality of human-environment interactions in special situations. Research over the past thirty years has helped clarify how human motivations, rules governing access to resources, the structure of social organizations, and the resource systems themselves interact to determine whether or not the many dramas of the commons end happily.

In this book, [...] leaders in the field review the evidence from several disciplines and many lines of research and present a state-of-the-art assessment.”

... to the Drama of the Commons

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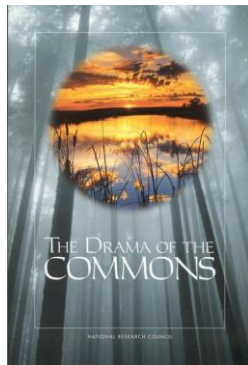
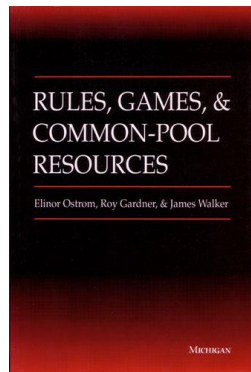
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Elinor Ostrom receives Nobel Memorial Prize in Economic Sciences "for her analysis of economic governance", in particular how common property could be successfully managed by groups using it.



History by Caroline Schill



The struggle to govern the commons

- Far from trivial to solve so-called collective action problems
- Cooperation among multiple and diverse actors is necessary to avoid the Tragedy
- What makes collective action emerge, sustain and be successful fascinated a wide variety of scholars (e.g. anthropologists, social scientists, economists, mathematicians)



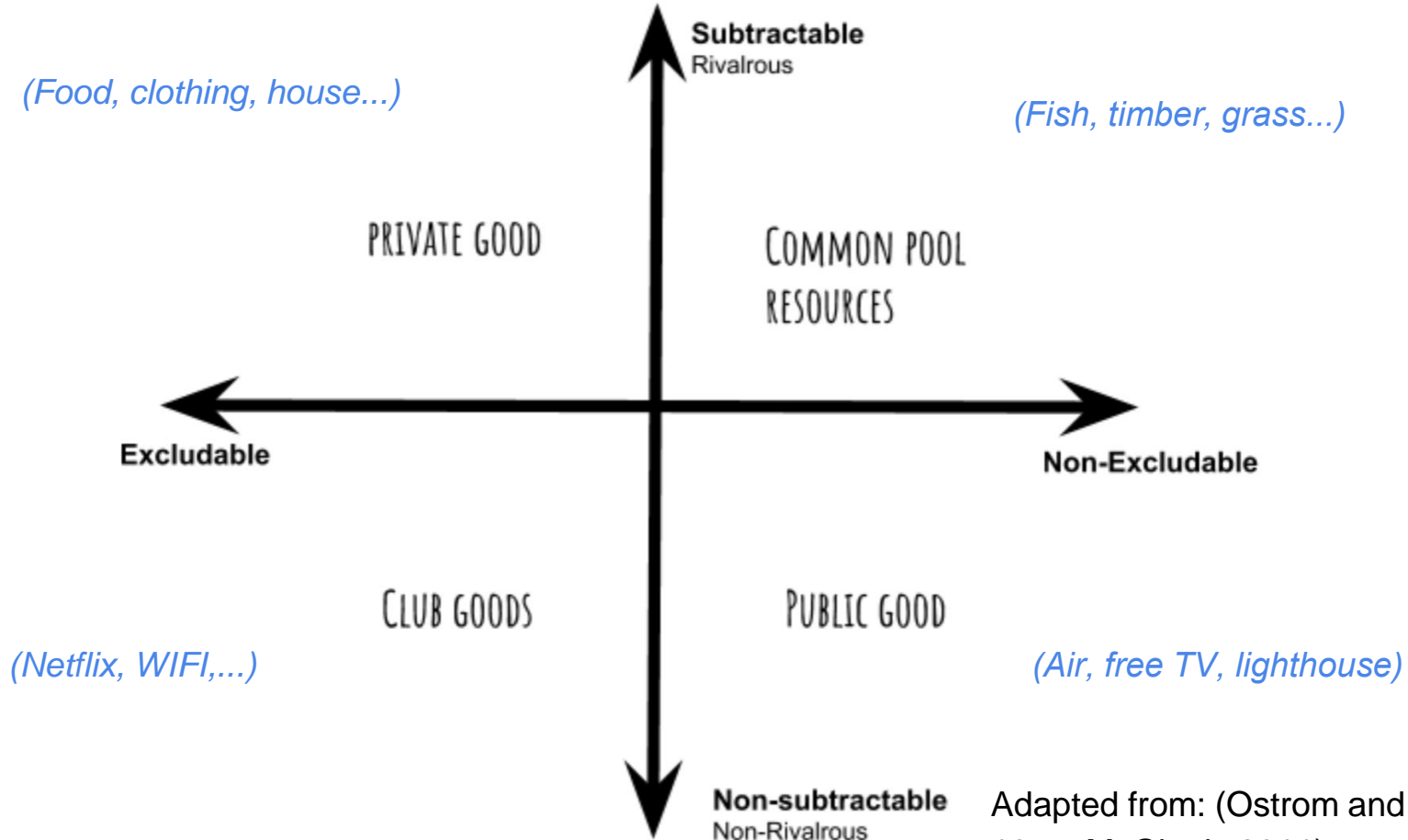
What are Common Pool Resources?

... are natural or human-made resources characterised by **subtractibility** and costly **excludability** (Ostrom 1990)

- Subtractibility: the use of the resource decreases the availability for all users
- Excludability: it is difficult, very costly, infeasible, undesirable to exclude others from using the resource.



Important definitions: types of goods (physical nature)



Adapted from: (Ostrom and Ostrom 1977, McGinnis 2011)

Definitions: types of property rights

A good can be primarily determined by its physical nature, but the de facto type may be affected by the way it is used.

Property rights: describe which actions can be carried out by which actor (who has the authority)

- Private property
- Public property
- Open access
- Common property

Definitions: types of property rights II

Private property:

- Bundles of rights held by and exchanged among **individuals** or legally recognised **corporate entities**;
- Generally recognised and enforced by the state;
- Usually exclusive and transferable
- Examples: privately forests and rangelands

Public Property:

- Bundles of rights held by **official agents** of some unit of government, general public has commonly equal access and use rights
- Examples: forests and rangelands held by the government, highways or public parks

(Feeny et al. 1990, McGinnis 2011, Dell'Angelo et al 2017)

Definitions: types of property rights III

Common (or communal) Property:

- Bundles of rights held, defined, and exchanged by some **communal entity** as a whole; often rights of equal access and use; rights may be legally recognised, in other cases the rights are de facto.
- Examples: 70% of the land in sub-Saharan Africa, water-users associations, many inshore fisheries and forests.

Open Access:

No effective restrictions on use of resource

- Examples: Many offshore ocean fisheries

Tragedy of the Commons =

Open access CPR (no governance in place)

Note about concepts

- **Property rights and good types:** are idealised types and analytic types. In practice, many resources can be classified in overlapping or even conflicting combinations; e.g. co-management (communities + governments)
- **Commons**, the term: is informally used to refer to public goods, common pool resources, or any area with *uncertain* property rights. For analytical purposes it is necessary to be more specific.

Solutions: Privatisation, stat control, self-governance

Privatisation or state ownership (Hardin 1968, see Feeny et al. 1990 and Basurto and Ostrom 2009 for references)

- Still today many governments and other authorities have the belief that those two options are the only viable ones
- ITQs as example in fisheries

Collective, self-organised governance (e.g. Ostrom 1990, Feeny et al. 1990, Dietz et al. 2003)

- Ostrom's design principles (Ostrom 1990)
- Trust, reciprocity, norms, communication, sanctioning (Ostrom 1998)
- There are no panaceas! (Ostrom 2007)

Note: holds mainly for local levels, smaller groups of people

Design principles for governing the commons

1. Clearly **defined boundaries** and users
2. **Congruence** among rules and with local conditions
3. **Collective-choice arrangements**
4. **Monitoring**
5. **Graduated sanctions**
6. **Conflict-resolution mechanisms**
7. **Recognition of rights to organise**
8. **Nested enterprises**

(Ostrom, E. 1990: Governing the Commons. The evolution of institutions for collective action. Cambridge University Press, Cambridge)

DESIGN PRINCIPLES FOR GOVERNING SUSTAINABLE RESOURCES

The following principles are frequently observed in sustainable institutional regimes:

- *Clearly defined boundaries.* The boundaries of the resource system, such as irrigation systems or fisheries, and the individuals or households with rights to harvest resource units are clearly defined.
- *Proportional equivalence between benefits and costs.* Rules specifying the amount of resource products that a user is allocated are related to local conditions and rules requiring labor, materials, and/or money inputs.
- *Collective-choice arrangements.* Many of the individuals affected by harvesting and protection rules are included in the group who can modify these rules.
- *Monitoring.* Monitors, who actively audit biophysical conditions and user behavior, are at least partially accountable to users and/or are users themselves.
- *Graduated sanctions.* Users who violate rules-in-use are likely to receive graduated sanctions (depending on the seriousness and context of the offense) from other users, officials accountable to these users, or both.
- *Conflict-resolution mechanisms.* Users and their officials have rapid access to low-cost, local arenas to resolve conflict among users or between users and officials.
- *Minimal recognition of rights to organize.* The rights of users to devise their own institutions are not challenged by external governmental authorities, and users have long-term tenure rights to the resource.
- *Nested enterprises (for resources that are parts of larger systems).* Appropriation, provision, monitoring, enforcement, conflict resolution, and governance activities are organized in multiple layers of nested enterprises.

SOURCE: E. Ostrom, *Governing the Commons: The Evolution of Institutions for Collective Action* (New York: Cambridge University Press, 1990), 90.

Solutions: better understanding humans

- What motivates us to take action / care about our co
- Importance for policies, underlying *behavioural assumptions*
- Trust, reciprocity, norms, communication, sanctioning

Example: **role of norms for behavioural change**

- Social norm: “a predominant behavioural pattern within a group, supported by a shared understanding of acceptable actions and sustained through social interactions within that group” (Nyborg et al. 2016)
- E.g. diet variation across countries – not only prices, income, and nutrition content; it appears that other forces, like norms, are involved.
- Important success factors: whether actions of others are observable —> example of recycling vs. use of antibiotics

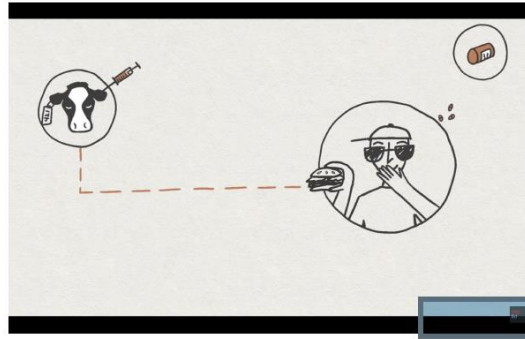


Examples common pool resources – what is on your mind?

- Discuss briefly with your neighbour

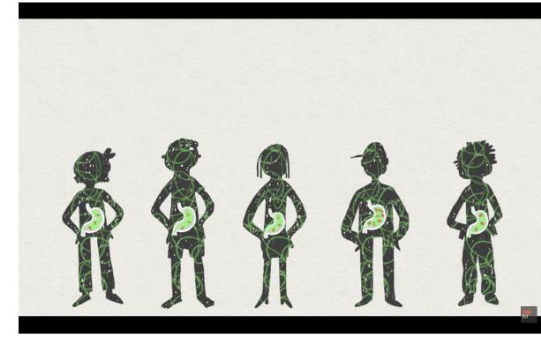
Examples

Over-usage of antibiotics



Short-term:

Gains in livestock and treating common illnesses



Long-term:

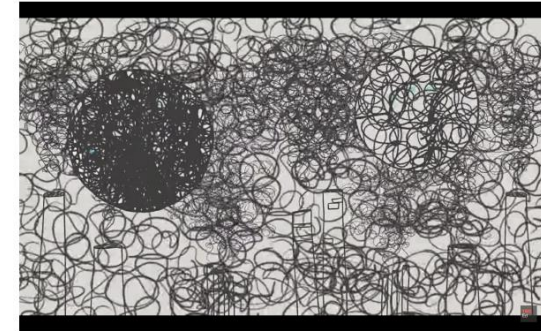
Evolution of antibiotic resistant bacteria which threatens the entire population

Energy based on fossil fuels



Short-term:

Cheap energy for customers and profits for its owners

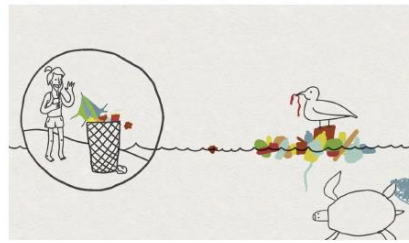


Long-term:

Pollution for thousands of years in the atmosphere

Examples

Littering



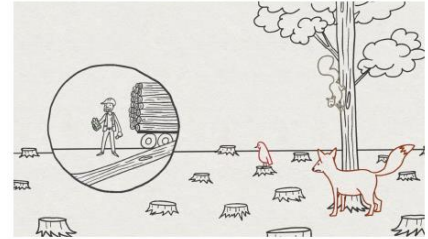
Purchase of bottled water



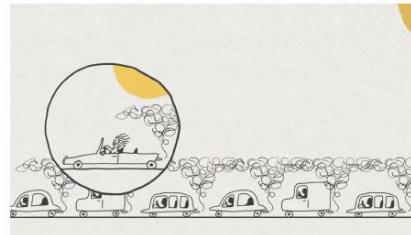
Watering



Deforestation



Traffic jams



...

Current challenges

Global commons

- Most solutions and successful cases have been reported at local level
What can be scaled up? How can we address climate change?
- Example: Transnational Corporations as 'Keystone Actors' in Marine Ecosystems (Österblom et al. 2015, 2017)

Commodification of nature - Payments for Ecosystem Services

- What are the consequences of introducing monetary
- incentives? Evidence of crowding out of intrinsic motivation, but evidence not conclusive yet

Urban commons: loss of nature experiences –
will we care less in the future?

In sum

- Tragedy of the commons – *painting the picture - Hardin & Ostrom*
- Short history – *From Tragedy to Drama of the commons*
- Important definitions – *goods typology & property rights*
- Solutions
- Examples of tragedies/drama
- Current challenges