Collective Action

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October 6, 2020

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Outline

The logic of Collective Action

Mancur Olson (1932-1998)

The logic of Collective Action

Unless the number of individuals in a group is quite small, or unless there is coercion or some other special device to make individuals act in their common interest, rational, self-interested individuals will not act ot achieve their common or group interests.

→ Zero contribution thesis.

Outline

Collective Action and the Evolution of Social Norms

Journal of Economic Perspectives—Volume 14, Number 3—Summer 2000—Pages 137–158

Collective Action and the Evolution of Social Norms

Elinor Ostrom

With the publication of *The Logic of Collective Action* in 1965, Mancur Olson challenged a cherished foundation of modern democratic thought that groups would tend to form and take collective action whenever members jointly benefitted. Instead, Olson (1965, p. 2) offered the provocative assertion that no self-interested person would contribute to the production of a public good: "[U]nless the number of individuals in a group is quite small, or unless there is coercion or some other special device to make individuals act in their common interest, *rational, self-interested individuals will not*

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Collective Action and the Evolution of Social Norms

- Prisoner's dilemma game as the canonical representation of collective action problems

→ zero contribution thesis underpins this presumption

→ That individuals cannot overcome collective action problems → need to have externally enforced rules to achieve their own long-term self-interest.

Collective Action and the Evolution of Social Norms

Zero contribution thesis

- Contradicts every life. Many people vote, do not cheat on their taxes, donate, etc.
- Extensive fieldwork: individuals voluntarily organize themselves so as to gain the benefits of trade, to provide mutual protection against risk, and to create and enforce rules that protect natural resources.

Focii of the paper

1. Experimental evidence
2. Potential theoretical explanation
3. Real-world empirical evidence

Experimental Evidence

- Rational egoist assumption *works well* in predicting the outcome in auctions and competitive market situations

→ By the end of round 5, predicted equilibrium is attained

- Collective action situations yield different results.

  Linear public goods games: each individual is endowed with a fixed set of assets and must decide how many of these assets to contribute to a public good.

→ Single-shot game: rational egoists contribute zero (theory)

→ Finite number of rounds: still zero (theoretical prediction)

Experimental Evidence

A huge number of public goods experiments

→ "core facts that theory needs to explain"

1. Subjects contribute 40-60% of their endowments (one-shot and first round of finitely repeated games)
2. Contributions levels decay downward (but above zero) after first round.

→ 70% contribute nothing in the last round (announced).

3. Beliefs matter. Those who believe others will cooperate also cooperate. Rational egoists do not.
4. Learning the game better increases cooperation. 10 vs 40 vs 60 rounds (experienced subjects cooperate at moderate levels)

Experimental Evidence

A huge number of public goods experiments

→ "core facts that theory needs to explain"

5. Face-co-face communication produces substantial increase in cooperation that are sustained across all periods including the last period (Ostrom and Walker, 1997).
6. Subjects will expend personal resources to punish those who make below-average contributions to a collective benefit (when allowed).
7. Context matters

→ Framing of the situation; rules used for assigning participants; communication; sanctioning mechanisms; benefit allocation

Toward a revised theory of collective action

- Two types of norm-using players (conditional cooperators and willing punishers) plus rational egoists

  Conditional cooperators are willing to initiate cooperative action when they estimate others will reciprocate

→ source of relatively high levels of contributions in one-shot or initial rounds of PD/PG games. [1-4] depend on this type.

→ Tend to trust others and be trustworthy in sequential PD games.

Two types: committed vs noncommitted (downward cascade if disappointed)

→ "Conditional cooperators are apparently a substantial proportion of the population."

Toward a revised theory of collective action

- Two types of norm-using players (conditional cooperators and willing punishers) plus rational egoists

  Punishers punish free riders through verbal rebukes or use costly material payoffs when available.

→ [5-6] outcomes depend on punishers.

Punishers can become rewarders.

Toward a revised theory of collective action

Multiple types of players in evolutionary processes

- Successful strategies survive.

→ Those carrying the more successful strategies for an environment reproduce at a higher rate.

- Human evolution during the Pleistocene era (3 million to 10,000 years ago).

→ roamed around as hunter-gatherers dependent on each other.

- Survival depended on 1)aggressively seeking individual returns, and 2) solving many day-to-day CAPs.

→ Ancestors who solved CAPs most effectively had a selective advantage

→ learned to recognize who was deceitful/trustworthy reciprocator.

Toward a revised theory of collective action

- Not so good at general logical problem solving
- Human brain appears to have evolved a *domain-specific, human reasoning architecture*

→ Use different approach to deontic reasoning (forbidden, obligated, permitted) versus true/false reasoning

→ T/F: we use confirmation strategy (open to evidence)

→ Deontic effects not associated with intelligence/education level (helps getting along)

- Empirical evidence: Modern humans have inherited a *propensity to learn social norms*.

Toward a revised theory of collective action

Indirect evolutionary approach

Players receive objective payoffs, but make decisions based on the transformation of these material rewards into intrinsic preferences. Those who value reciprocity, fairness, and being trustworthy add a subjective change parameter to action (of themselves or others) that are consistent or not consistent with their norms.

→ allows players with a predisposition to act in a certain way

→ allows those preferences to adapt (in iterative scenarios)

- IEA explains how a mixture of norm-users and rational egoists emerge

Toward a revised theory of collective action

Evidence in support of IEA

- One-shot, sequential, double-blind PD game:
  40%($N = 136$) ranked $(C, C) \succ (D, C)$ (defect while other cooperates);
  27%$ranked(C, C) \backsim (D, C)$.

  Eventhough (D, C) was a higher payoff strategy.
- Bad experiences alter preferences.

  After 12 rounds of a finitely repeated PD game (partners randomly selected each round, 72 subjects), where rates of cooperation were low:
  Only 19% ranked $(C, C \succ (D, C)$;
  17%$ranked(C, C) \backsim (D, C)$

Toward a revised theory of collective action

Evidence in support of IEA

- Externally imposed sanctions crowd out endogenous cooperative behavior (Frey, 1994).

→ In a game that used an externally impossed, incentive-compatible mechanism designed to enhance cooperative behavior,

  - greater cooperation occured (in early games) but transient.
  - removal of external mechanism undermined subsequent cooperation and leave the group worse off than PD outcomes

... a social norm, especially in a setting where there is communication between the parties, can work as well or nearly as well at generating cooperative behavior as an externally imposed set of rules and system of monitoring and sanctioning.

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

- World of strong external monitoring and sanctioning:
  $\rightarrow$ cooperation is enforced w/ot internal norms
- World of no external rules or monitoring:
  $\rightarrow$ norms evolve to support cooperation.
- World of mild external monitoring:
  $\rightarrow$ discourages norm formation; attractive for some players to deceive and defect.

The evolution of rules and norms in the field

- Extensive studies on collective action in the field
- Cooperation levels vary from extremely high to extremely low.
- Contextual variables matter:

→ the type of production and allocation functions; the predictability of resource flows; the relative scarcity of the good; the size of the group involved; the heterogeneity of the group; the dependence of the group on the good; common understanding of the good; the size of the total collective benefit; the marginal contribution by one person to the collective good; the size of the temptation to free ride; the loss to cooperators when others do not cooperate; having a choice of participating or not; the presence of leadership; past experience and level of social capital; the autonomy of binding rules; and a wide diversity of rules that are used to change the structure of the situation.

Broadly similar but distinctly different CPRs

Table 3.1. *Design principles illustrated by long-enduring CPR institutions*

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 labor, material, and/or money.
3. Collective-choice arrangements
   Most individuals affected by the operational rules can participate in modifying the operational rules.
4. Monitoring
   Monitors, who actively audit CPR conditions and appropriator behavior, are accountable to the appropriators or are 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 offense) by other appropriators, by officials accountable to these appropriators, or by both.
6. Conflict-resolution mechanisms
   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 organize
   The rights of appropriators to devise their own institutions are not challenged by external governmental authorities.

For CPRs that are parts of larger systems:

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

Outline

Journal of Theoretical Politics 15(3): 239–270
0951–6928[200307]15:3; 239–270; 033623

HOW TYPES OF GOODS AND PROPERTY RIGHTS JOINTLY AFFECT COLLECTIVE ACTION

Elinor Ostrom

ABSTRACT

The study of collective action has matured dramatically since Mancur Olson challenged scholars by positing a general theory in his pathbreaking book on *The Logic of Collective Action* (1965). Olson's theoretical predictions related to the incapacity of individuals, except under limited conditions, to solve on their own what are now known as 'collective action problems'. Olson argued that one characteristic of goods – that of exclusion – defined all public goods. In contemporary analysis, the problem of achieving exclusion of non-contributors has come instead to characterize all types of collective action problems. Multiple subtypes of collective action problems have been identified.

How Types of Goods and Property Rights Jointly Affect Collective Action

Subtypes of CAPs:

1. Public goods
2. CPRs
3. Club goods

- Olson's classification ← Paul Samuelson and Musgrave
- Samuleson (1954) uses one attribute (jointness of consumption) → two types of goods: private and public
- Musgrave uses excludability (less assertive)

	Samuelson's Classification	
Musgrave's Classification	One person's consumption subtracts from total available to others	One person's consumption does not subtract from total available to others
Exclusion is Feasible	Cell A	Cell B
Exclusion is Not Feasible	Cell C	Cell D

Figure 1. Samuelson's and Musgrave's Classification of Goods

- Olson adopted Musgrave's definition → *general theory* for all goods.
- Exclusion as the key attribute in all collective action problems
- Cell C (public goods); Cell D (Public Goods)

... [M]any people facing collective action problems in the field have changed the structure of the problem they face by building walls (the walled cities of medieval times were, after all, a way of excluding outsiders from the defense of the city) or creating property rights (inshore fishers have long used customary law to enforce locally devised rules as to who is allowed to fish).

CAPs differ:

→ how costly or difficult it is to *devise physical or institutional means to exclude others*.

→ biophysical world (ocean versus a farmer's pond).

- Next Conundrum (given these diff): can one thery explain all patterns and outcomes for CAPs? (as Olson hoped)

"After 30 years of unsuccessful efforts to build one explanatory theory for all collective action problems and multiple insightful critiques of these efforts, I will argue strongly that further efforts to build a single general theory are counterproductive."

CPRs and Public Goods

Olson's public goods:

1. 'exclusive public good' (Cell C).

→ groups try to keep their size small (try 100% participation)

⇝ CPRs

2. 'inclusive public good' (Cell D).

→ The more members who share the costs, more services can be provided (non-subtractability)

Lab experiments:
"CPRs and public goods are not only theoretically different types of goods but behavior in situations related to provision of one or the other type of good is substantially different" (Ostrom et al., 1994).

CPRs and Public Goods

- Finitely repeated public goods experiment:

  1^{st} *round* : subjects on average contribute about 50% of the optimal level

  other rounds : follow *a pulsing decay pattern downward* toward but never reaching the symmetric Nash equilibrium.

- In a CPR experiment:

  One person's aggressive withdrawals can generate very high costs for everyone else.

  Initial rounds : subjects do much *worse* then Nash

  Next rounds : pulse upward toward the symmetric Nash equilibrium from below.

- CPRs and Public goods present different types of CAPs.

Other factors affecting CAP types

- Mobile like fish versus stationary likes trees (Schlager et al., 1994)
- Whether there is storage in the system

Production functions

- A typically assumed (linear) production function that determines the total amount of public good, TG, is:

  $TG = P(Ex_i)$

  where, P is the marginal production externality created by contribution to the public good (Isaac and Walker, 1988).

  E is endowment; x_i is the contributing part of the endowment for public good production

→ If $P = 0.25$, person who contributes \$1.00 generates a public good of 0.25

→ If 4 people contribute \$1.00 each, total return = total cost.

Production functions

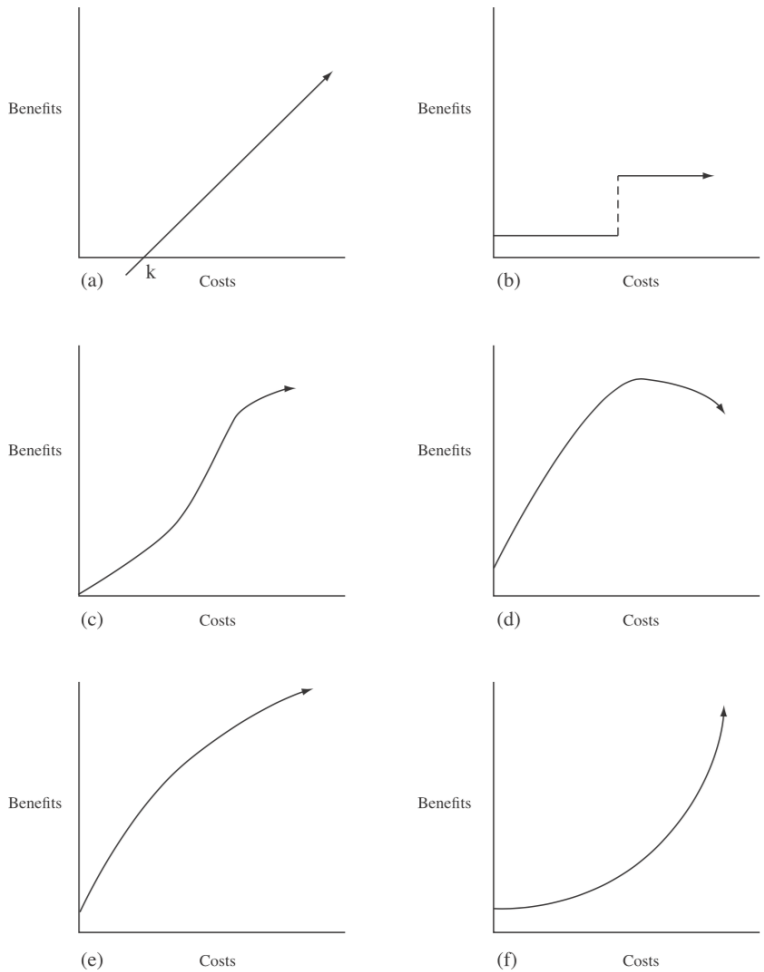

Figure 2. General Types of Production Function, (a) Linear, (b) Step Function, (c) General Third Order, (d) Quadratic, (e) Concave and (f) Convex.

Source: Modified from Marwell and Oliver (1993: 59).

- a variety of monotonically increasing, nonlinear production functions relating individual contributions and the total benefits
- Except d: yield functions for CPRs assumed quadratic by Scott Gordon (1954).
- Convex (e.g. f) positive interpendence (each contribution makes next more worthwhile)
- Concave (e.g. e): every contr. increases TB but MR decreases more & more.

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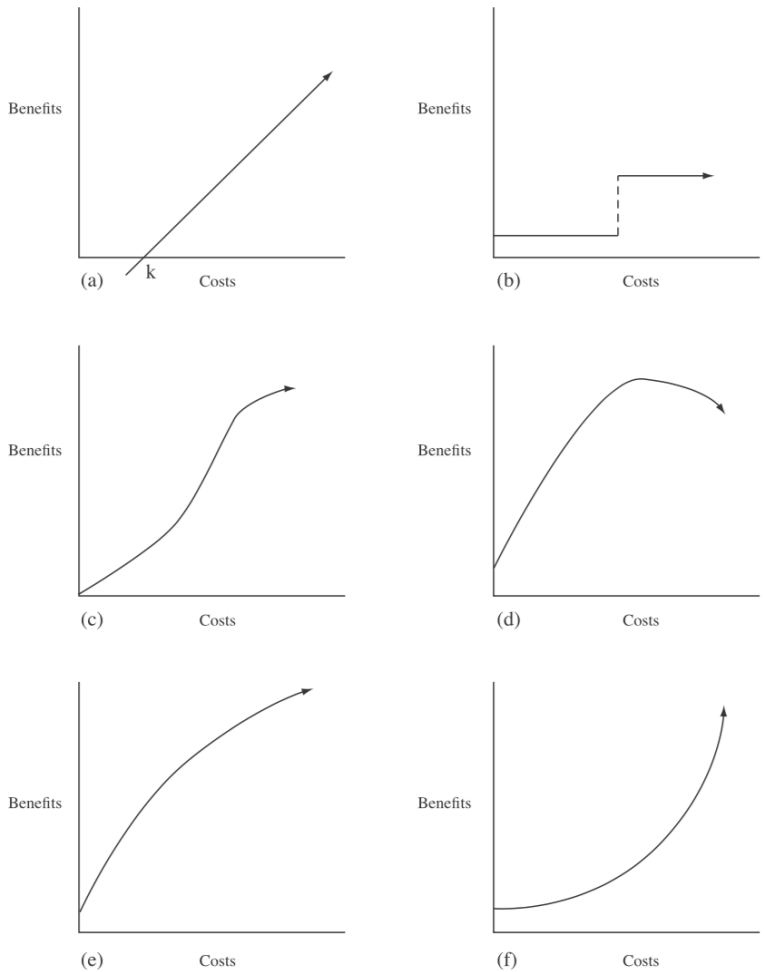
Production functions



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- Settings where mass actions are needed to gain benefits involve convex functions (e.g. strike)
- Step-level functions (b): actions by k participants make no difference; k+1 partcipants discontinuously shift the benefit upward.

→ Hardin (1976) argued that public good is a step function

assurance vs PD problems

Allocation functions

- Analysis of the function that assigns individuals a share of the total benefits or the total costs
- Typically assumed that allocations to all in a group.
- Individual utility is a result of the operation of a production function, P, as well as an allocation function, A

$$U_i = U_i[(E - x_i) + A \cdot P(Ex_i)]$$

- Non-divisible good: each person receives TG (e.g. peace and security)
- In a CPR game, A can be operationalized as x_i/Ex_i or as a proportionate share of total based on contr. rates.

Allocation functions

- Allocation formulas: participants feel their contribution is critical
- Host of allocation functions in field settings: 1) accd to assets held; 2) seniority of claims; 3) spatial and temporal formula.
- Social dilemma is transformed into an assurance game.

→ not contributing and not receiving anything; contributing and receiving something.

Diversity of property rights in CPRs

- Key argument: a) attributes of the goods *produced* and *allocated*, as well as the *rules used for their production and allocation* affect incentives (define game types.)
- First, focus on exclusion costs:

→ if exclusion is costly, CAP.

- Second, focus on subtractability:

→ Subtractive: face a CPR type CAP.

- Further, examine how diverse property-rights regimes are likely to perform and be used.

Diversity of property rights in CPRs

- Common property $\neq$ open-access property (necessarily).

Common-pool resources may be owned by national, regional, or local governments, by communal groups or by private individuals or corporations. When they are owned by no one or paradoxically by 'everyone', they are used as open access resources by whomever can gain access. The confusion between common property and open access is rampant.

- CPRs are not automatically associated with common-property regimes – or with any other particular type of property regime.

Diversity of property rights in CPRs

TABLE 1

BUNDLES OF RIGHTS ASSOCIATED WITH POSITIONS

	Owner	Proprietor	Claimant	Authorized User
Access and Withdrawal	X	X	X	X
Management	X	X	X	
Exclusion	X	X		
Alienation	X			

- Instead of focusing on one right to solve all CAPs, it is more useful to defines classes of property-rights to solve different CPAs (exclusion, allocation, maintenance, preservation).
- The world of property rights is far more complex than simply government, private and common property.

Diversity of property rights in CPRs

Questions

Why do CPR users elect to use a communal (or private) property system to solve specific CAP?

What CPR attributes are conducive to communal proprietorship (ownership) vs individual?

"Even though all common-pool resources share the difficulty to devising methods to achieve exclusion and the subtractability of resource units, the variability of common-pool resources is immense in regard to other attributes that affect the incentives of resource users and the likelihood of achieving outcomes that approach optimality.

- availability and costs of technical and institutional solutions to exclusion

General Theory of Collective Action?

- Mancur Olson envisioned a general theory for the entire territory of collective action.
- The territory turned out to be too vast and too heterogeneous for one general theory.
- CPR problems (e.g. high use leads to congestion, degradation, and destruction) dont apply to public goods
- The task of elucidating the theoretical family tree of collective action theories only **starts with the distinction between public goods and common pool resources (Step 1).**
- **Next, examine how production and allocation formulae change the structure of incentives (Step 2)** facing participants $\rightarrow$ outcomes.

General Theory of Collective Action?

Another realm of theoretical development

- **Focus on the structure of property rights (Step 3)**.
- Instead of distinguishing between 'well-defined property rights' based only on alienation rights; five distinct bundles of rights.
- Any of the five may or may not be well-defined.
- Incentives (and thus CAPs) differ according to which combination of rights are possessed.

General Theory of Collective Action?

Another realm of theoretical development

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General Theory of Collective Action?

- **Focus on the attributes of the resource system (Step 4)**.
- What attributes are conducive to common property and to individual private-property regimes?

→ provide a theoretical synthesis.

- Instead of a general conclusion that one kind of property regime is best for all types of CPRs, a diversity of attributes affects the incentives of participants and the resulting performance.

Is land a private good?

- **Abundance:** Where population density if extremely low, land is abundant and land generates a rich diversity of plant and animal products without much husbandry:

→ $E(costs) > E(benefits)$ to establish and defend boundaries.

→ Settlers may develop one large, common parcel before dividing into small parcels in new terrains (high risk, harsh environment, lack of knowledge)

- **Scarcity:** May want to enclose land through fencing and institutional means to protect investments.

→ decision to enclose is a multi-step process from an open-access to single family private plots.

Is land a private good?

- Private and communal property regimes exist side by side.

> ... same individuals fully divided their agricultural land into separate family-owned parcels but that grazing lands located on the Alpine hillsides were organized into communal property systems.. In these mountain-valleys, the same individuals used different property-rights systems side-by-side for multiple centuries.

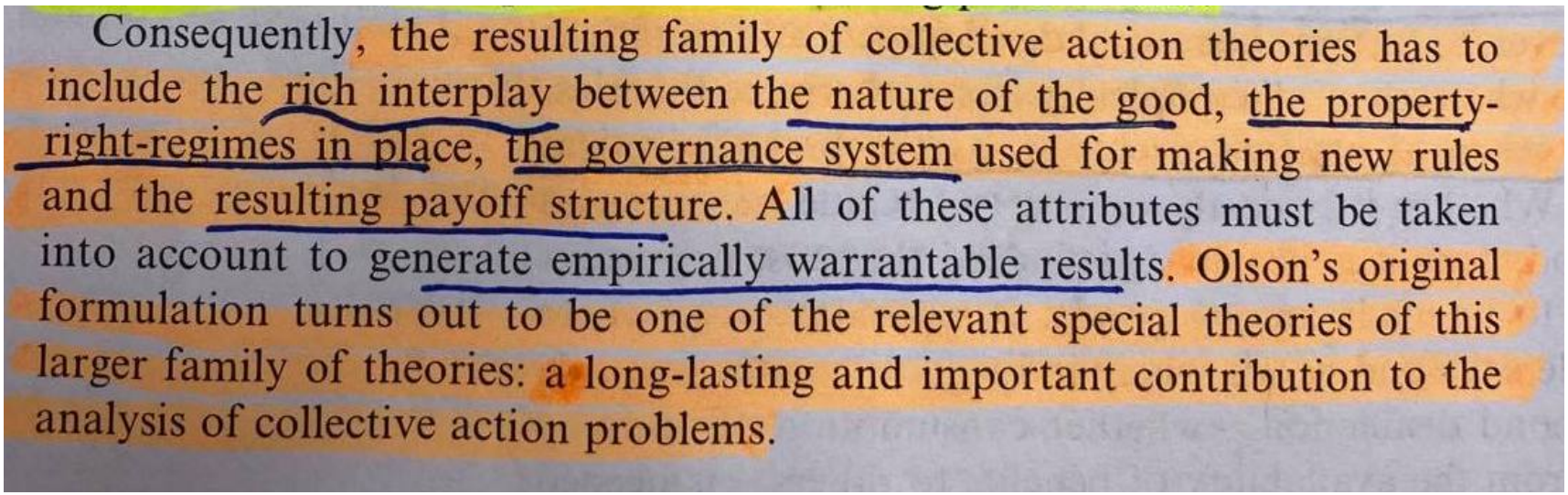
- Types of land and land uses $\rightarrow$ suited for different property system.

Attributes conducive for communal property rights

1. low value of production per unit of area;
2. high variance in the availability of resource units on any one parcel;
3. low returns from intensification of investment'
4. substantial economies of scale by utilizing a large area;
5. substantial economies of scale in building infrastructures to utilize the large area.

- Need to invest time and effort in the development of rules that would reduce the incentives to overexploit.

Takeaway



Consequently, the resulting family of collective action theories has to include the rich interplay between the nature of the good, the property-right-regimes in place, the governance system used for making new rules and the resulting payoff structure. All of these attributes must be taken into account to generate empirically warrantable results. Olson's original formulation turns out to be one of the relevant special theories of this larger family of theories: a long-lasting and important contribution to the analysis of collective action problems.

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