

The tragedy of the commons revisited: Hardin meets Ostrom

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Hardin’s seminal 1968 essay, “The Tragedy of the Commons” has generally been interpreted as advocating the enclosure or privatisation of the commons as the only means of conserving it. It will be argued that this interpretation with its exclusive emphasis on “the commons” fails to address what is actually at stake for Hardin – “the tragedy” of the recalcitrant belief in limitless economic growth. This article revisits Hardin’s essay and its critical reception to refocus our attention on its actual object of critique: the limitless growth incentive. If it is this capitalist logic that leads to ruin, as Hardin maintains, he could not have meant to advocate this same logic with its emphasis on property rights as a way to avert the tragedy. Nobel Laureate in Economics, Elinor Ostrom’s research refutes Hardin’s draconian pessimism by unearthing how numerous communities across the world had been deftly avoiding the tragedy of the commons for centuries. She investigated collaborative management systems across the globe in which communities have successfully preserved a shared resource and provided for their members without relying on privatisation or top-down government control. More than merely providing empirical counter-evidence, Ostrom discovered that humans have a much more complex motivational structure and a far greater capacity to solve social dilemmas than posited in earlier rational-choice theory with its assumption of egoistic, self-interested individuals who maximise utility. Hence, rather than being diametrically opposed, it is argued that Ostrom discovered the solution to the problem that Hardin in part misdiagnosed.

The argument

Garrett Hardin’s seminal 1968 essay, “The Tragedy of the Commons” was written against the backdrop of the post-World War II population growth coupled with rapid industrialisation and urbanisation in many parts of the world, which raised concerns about the overexploitation of common pool resources, such as fisheries, forests, grazing lands and water sources. The essay has generally been interpreted as advocating the enclosure or privatisation of the commons as the only means of conserving scarce natural resources and preventing issues such as overgrazing, deforestation, soil erosion and the depletion of fish stocks. This univocal interpretation was informed, in large part, by the broader transformation in Western politico-economic thinking, which turned towards the neoliberal policies of economic privatisation and political individualism as remedies for the stagnation of Keynesian welfare-state capitalism. As MacLellan (2015, 42) puts it,

Hardin’s imperative to enclose the commons in the interest of ecological protection was largely understood as an argument for the congruence of market economics and environmental stewardship in the Lockean tradition: only the efficiencies produced by market competition can compel economic actors to operate with the discipline appropriate to ensure environmental resources are optimally exploited.

First, I will challenge this interpretation to uncover what I believe is really at stake for Hardin. What Hardin takes issue with, as will become clear, is the capitalist rationality of optimising self-interest through a cost-benefit calculus operative in unenclosed commons. Privatisation, then, would

not safeguard the commons from this capitalist rationality, but subject it to unmitigated market competition, which conceives of development in terms of the unquestionable pursuit of boundless growth. Hardin's call to enclose the commons should therefore not be interpreted as supporting increased economic privatisation as the best way to protect the environment, which is the common assumption. Instead, his argument for enclosing the commons is more accurately understood as a call for greater public control over scarce and unowned resources, particularly in situations where these resources are being exploited by market forces. The rationale for challenging the standard interpretation of Hardin's essay now is not only that it became "the 'scientific' foundation of World Bank and IMF policies, viz. enclosure of the commons and the privatization of public property" (Boal 2006 cited by MacLellan 2015, 42), but that it continues to inform much contemporary research on climate change that endorses the market as the best means to decrease planetary carbon emissions (see Posner and Weisbach 2010). In the second instance, I will contend that Hardin's and political economist and Nobel Laureate, Elinor Ostrom's positions are not diametrically opposed as the debate has traditionally been framed. Rather, I will show that Ostrom discovered the solution to the problem that Hardin partially misdiagnosed.

Philosophical import of the Ostrom-Hardin debate

The Ostrom-Hardin debate turns on deeply philosophical questions about human nature, collective action, and the normative structures – rights, duties, justice – that ought to govern our shared world. Ostrom and Hardin offer competing conceptions of human rationality and morality. Hardin's 1968 model assumes that individuals are isolated, self-interested maximisers whose "rational" pursuit of personal gain inevitably destroys common resources, whereas Ostrom's empirical research shows that people regularly transcend narrow self-interest through trust, reciprocity and locally crafted norms to manage commons successfully. Which picture of human nature is correct? Must ethics always contend with an inherent selfishness, or can moral norms and institutions reliably cultivate genuine cooperation? These questions are integral to meta-ethical debates over moral motivation, the is-ought gap, and the grounding of collective responsibility. Hardin's and Ostrom's respective models of common-pool resource management are based on divergent normative theories of justice and governance that raise fundamental political philosophical questions about the legitimacy of authority, the role of consent, and the balance of individual liberty and collective constraint. Whereas Hardin has been interpreted to depart from a Hobbesian view that strong sovereign rules are needed to curb our baser impulses – leading to the conclusion that he supposedly insists upon either privatisation or the imposition of top-down regulation, Ostrom identifies design principles for self-governing institutions, such as boundary rules, collective choice, monitoring, and graduated sanctions, that realise justice through participatory, bottom-up governance. Also of philosophical import is the methodological question of how philosophy should engage social reality. Hardin uses a stylised thought experiment – an idealised pasture and herders – to derive a universal conclusion about commons. Is such abstract modelling sufficient, or must we ground our normative theories in empirical complexity as Ostrom does with her detailed fieldwork – case studies of irrigation systems, fisheries, forests, etc. – to show the diversity of possible institutional arrangements? Hardin and Ostrom also depart from divergent conceptualisations of the commons. Hardin treats the commons as unregulated open access resources, reducible to a single game theoretic structure (the prisoner's dilemma), whereas Ostrom sees the commons as a distinct property regime – common-pool resources subject to collective governance that are not merely open access. The debate forces us to examine how conceptual choices shape our normative prescriptions. It exemplifies how analytic precision in defining terms can alter entire policy approaches.

Hardin's environmental pessimism

To elucidate what exactly he means by "the tragedy of the commons", Hardin invokes mathematical amateur, Willian Foster Lloyd's pastoral scenario:

Picture a pasture open to all. It is to be expected that each herdsman will try to keep as many cattle as possible on the commons. Such an arrangement may work reasonably satisfactorily

for centuries because tribal wars, poaching, and disease keep the numbers of both man and beast well below the carrying capacity of the land. (Hardin 1968, 1244)

When a self-interested herdsman increases the size of their herd, they personally gain from it, but the negative consequences of overgrazing are distributed among all those who use the shared land.

...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. Ruin is the destination toward which all men rush, each pursuing his own best interest in a society that believes in the freedom of the commons. Freedom in a commons brings ruin to all. (Hardin 1968, 1244; emphasis added)

While Lloyd seems to describe a pre-industrial agrarian economy, the chain of events is undoubtedly governed by capitalist logic – where capital is in the form of livestock and the “rational” herdsman is considered “rational” insofar as he acts to maximise his own gain. In capitalism, as we know, the means of production are in private hands and the presiding rationality is concerned with individual gain only. If we were to believe Adam Smith, these “private hands” will somehow be “led by an invisible hand to promote...the public interest” (Smith 1776; cited by Hardin 1968, 1244). According to Hardin, Smith contributed to

a dominant tendency of thought that has ever since interfered with positive action based on rational analysis, namely, the tendency to assume that decisions reached individually will, in fact, be the best decisions for an entire society. (Hardin 1968, 1244)

According to this logic, the logic which Hardin insists needs to be “exorcised” (ibid.), unfettered free trade to maximise profit will lead to society flourishing organically. However, a few centuries of capitalism have – instead of ever-increasing global human flourishing – led to perilous wealth disparity and the depletion of natural resources. The point of the pastoral parable seems to be that the capitalist logic only holds when the resources – the commons or grazable pastures – are inexhaustible. In the parable, they appear to be inexhaustible because at the time, as we recall, “tribal wars, poaching, and disease [kept] the numbers of both man and beast well below the carrying capacity of the land” (Hardin 1968, 1244).

This brings us to one of Hardin’s main targets of critique: the population problem.¹ If our natural resources are finite but the population keeps increasing, the per capita share of the world’s goods must steadily decrease. It is therefore – in more ways than one, as Hardin argues – impossible to realise Bentham’s goal of the “the greatest good for the greatest number”. Before coming to Hardin’s supposed solution to the dire consequences of unlimited population growth for the commons, we need to take stock of a few points he makes that are crucial for an accurate understanding of the tenor of his argument:

First, he insists that the population problem is a “no technical solution problem”. A technical problem, by his account, is a problem that “requires a change only in the techniques of the natural sciences, demanding little or nothing in the way of change in human values or ideas of morality” (Hardin 1968, 1243). It is an approach to the problem that aims “to avoid the evils of over-population without relinquishing any of the privileges that we now enjoy” (ibid.), e.g. over-population might be addressed by farming the oceans in the belief that aquaculture will bring about a new economic revolution, or by genetically modified crops, or by more stringent and efficient recycling regimes, or by the promise that science will eventually conquer space and the limited world as we know it now will prove infinite after all. In the process, the capitalist production and consumption drive at

1 It should be noted that Garrett Hardin was an outspoken proponent of eugenics and white-supremacist ideas – commitments that helped give rise to his “lifeboat ethics” and infuse the classic tragedy-of-the-commons argument with a distinctly reactionary subtext. While this article does not engage with the broader political or moral failings of Hardin’s ideology, readers ought to be aware of the context in which his formulation was first advanced.

the service of the profit incentive is not challenged, but alternative means are sought to produce and consume even more without sacrificing profit – even in the face of the rapid decline of natural or raw materials needed for production.

Secondly, he explicitly and unequivocally critiques the capitalist belief in limitless economic growth. Commenting on the parable of the herdsmen, he states that each of them is locked into a system that impels them to keep on increasing their herds. This is the injunction to limitless growth in a limited world that cannot but end in ruin (see Hardin 1968). It is in this injunction that governs the thinking of so-called rational men that tragedy resides for Hardin.

Thirdly, then, what Hardin takes issue with is not common or shared property itself, as MacLellan (2015) rightly points out, but rather the concept of freedom within a commons. The object of his critique is not popular or communal autonomy, however, but the kind of freedom endorsed by Adam Smith's theory of the invisible hand: the unrestricted freedom to pursue one's self-interest without concern for the social consequences, based on the belief that the market will always convert individual optimisation of interest into collective gain. But in what precise sense does Hardin employ the concept of "tragedy"?

Tragedy

Hardin directs his readers to what philosopher, Alfred North Whitehead (1948, 17; cited by Hardin 1968, 1244) meant by tragedy: "[t]he essence of dramatic tragedy is not unhappiness. It resides in the solemnity of the remorseless working of things". The strength of this dramatic form lies not in its disastrous ending, but in the ominous understanding that events were destined to unfold this way. In tragedy, there is no uncertainty. From the beginning, it is evident that destruction and downfall are unavoidable. Whitehead's definition, as we know, is not original as it is precisely how tragedy was understood by the Greeks. Aristotle in his *Poetics* explains that the outcome of the tragic narrative must "follow as cause and effect" rather than proceed by mere chance (Aristotle 2005, 29). What enables the narrative to evoke the most profound sense of dread and commiseration in its audience is its ability to accommodate entirely *rational* content into its plot, culminating in inescapable consequences. Even though the protagonist makes no mistakes in their rational calculus of costs and benefits, tragedy unfolds nonetheless. What renders the outcome genuinely tragic, and consequently truly horrifying, is the realisation that it was precisely rationality itself that allowed events to progress in a logical cause-and-effect manner, ultimately leading to the unavoidable tragic outcome (MacLellan 2015).

For Hardin, the tragedy of the commons, is the "tragedy of *freedom* in a commons" (Hardin 1968, 1244; emphasis added). He is specifically opposed to two freedoms: first, the "freedom to breed", which, according to him, "is intolerable" (Hardin 1968, 1246), a contention for which he has extensively been critiqued and which has overshadowed his far more important opposition to the freedom to pursue individual profit without limit. It is herein that tragedy resides for Hardin. This is more or less equivalent to the assumption of rational choice theory² that individuals are rational actors who make choices that maximise their own self-interest. As Ostrom (2009, 430) points out, rational choice theory takes for granted the erroneous

assumption that individuals have complete information about all actions available, the likely strategies that others will adopt, and the probabilities of specific consequences that will result from their own choices.

As we shall see, it is Ostrom's efforts to go beyond rational choice theory in explaining individual decision-making that enable her to recognise – contrary to Hardin – that we are not in fact "locked into a system that compels [us] to increase [our] herd[s] without limit" (Hardin 1968, 1244). Contrary to this assumption of complete rationality, Ostrom maintains that individuals are "boundedly rational" and when they do interact over time, it is reasonable to assume that they learn more accurate information about the actions they can take and the likely actions of other individuals

2 Citing Alchian (1950), Ostrom (2009, 430; emphasis in original) points out that "'rational choice theory' is not a broad theory of human behavior but rather a useful *model* to predict behavior in a particular situation – a highly competitive market for private goods".

(Ostrom 2009; citing Selten 1990 and Simon 1955).

Solution?

As a countermeasure, Hardin has been interpreted to suggest that we enclose the commons so as best to protect it from exploitation. This interpretation is largely responsible for the widely held belief that the only way to avoid the tragedy is through government regulation or privatisation. In the essay, Hardin mentions private property as a means that has been employed to prevent pollution of land-based natural resources, but immediately qualifies privatisation as far from an ideal or effective measure:

our particular concept of private property, which deters us from exhausting the positive resources of the earth, favors pollution. The owner of a factory on the bank of a stream, whose property extends to the middle of the stream – often has difficulty seeing why it is not his natural right to muddy the waters flowing past his door. (Hardin 1968, 1245)

In fact, Hardin later added a notable corrective to his original essay admitting that

the weightiest mistake in my synthesizing paper was the omission of the modifying adjective “unmanaged”...a “managed commons” describes either socialism or the privatism of free enterprise. Either one may work; either one may fail: “The devil is in the details”. (Hardin 1998, 682)

To read Hardin as advocating privatisation without qualification, then, would be to miss the point. That would mean that he considers the problem of a limited commons exposed to exploitation by an exponentially expanding population of consumers precisely as having a technical solution, i.e. privatisation and preservation by way of “rational” management of the commons. In other words, he would be interpreted as advocating capitalism as both cause and cure. It would be to evade questioning the dominant capitalist logic with its blind belief in limitless economic growth. Rather than questioning the rational status of this rationality by exposing it as precisely fundamentally *irrational* in a limited world, it would merely amount to the humdrum response that capitalism will find a way. If what is tragic in the commons is (1) the freedom to breed, and (2) the freedom to pursue limitless profit, then enclosure cannot possibly be a sufficient or even appropriate mechanism to curtail those freedoms given that privatisation is based on the axiomatic pursuit of limitless growth, which may in fact exacerbate the population problem. Think, for example, of the Green Revolution attributed to American plant scientist, Dr Norman Borlaug’s breeding of high-yielding, disease-resistant crops. Instead of challenging the rate of consumption as driver of the subsequent rate of production, it has found a way to produce more to satiate the ever-increasing consumption need. While saving millions in famine-ridden areas, the Green Revolution has also been criticised for contributing to overpopulation worldwide.

What then is the moral of this tragic story if not simply that we are hurtling to our inevitable end in a completely rational fashion? If it is precisely rationality itself that permits events to unfold as cause and effect and produce the inevitable tragic outcome, if it is this recognition that makes the outcome truly and utterly tragic, then the tragedy could be averted if rationality itself, i.e. the cause and the ongoing propellant of the tragic course upon which we find ourselves, is subverted. According to Ostrom, Hardin’s diagnostics was partly right and partly wrong. Under conditions of low-density population, the herdsmen’s rationality might conform to the predictions of rational choice theory, but when their common fate is at risk, she discovered that the herdsmen have an innate propensity to supersede that rationality.

The Ostrom-Hardin challenge

By invoking herdsmen sharing a pasture, Hardin can easily be interpreted as meaning that community-based resource management will inevitably lead to tragedy. It is precisely there, however, where Ostrom finds solutions. Ostrom’s environmental optimism is founded on her in-depth scholarship on the tendency of communities to self-regulate when faced with limited resources. What is known as the “Ostrom-Hardin challenge” has been interpreted as revolving

around competing theories regarding the management of common-pool resources. Rather than top-down government regulation or privatisation, Ostrom discovered numerous communities around the world successfully self-managing common-pool resources. Importantly, Ostrom takes for granted the standard interpretation of Hardin's tragedy of the commons and the commons as a prisoner's dilemma, which she overturns by demonstrating that tragedy is not inexorable and cannot be generalised (Araral 2014).

Ostrom argues that, under certain conditions, communities are capable of self-organising and establishing rules and institutions that promote sustainable resource management. She identifies design principles³ that contribute to the success of such arrangements, including clear user and resource boundaries, proportional rules adapted to local needs, self-imposed monitoring of both the users and the resource,⁴ graduated sanctions, conflict-resolution mechanisms, and nested layers of governance that fit the resource system (Ostrom 1990).

The way in which the debate has been framed takes for granted two common misreadings of Hardin's essay: (1) instead of recognising that he was critiquing capitalist rationality, it is argued that he

assumed that human nature [as such] is selfish and unchanging and that society is just an assemblage of self-interested individuals who don't care about the impact of their actions on the community (Angus 2008; cited by MacLellan 2015, 49);

and (2) that he advocated government intervention or privatisation as a solution without acknowledging that he was in fact insisting on the "necessity"⁵ of "mutual coercion, mutually agreed upon by the majority of people affected" (Hardin 1968, 1247). On the issue of private property, Hardin acknowledged that it was unjust, but maintained that "[i]njustice is preferable to total ruin" (ibid.). While interpreted to sit on opposite sides of the fence, both Hardin and Ostrom, in fact, supported some form of (self-)regulation of the commons. Moreover, as we shall see, Ostrom provides a solution to the problem that Hardin partly misdiagnosed.

Ostrom's environmental optimism

According to Ostrom (1998, 1), social dilemmas

occur whenever individuals in interdependent situations face choices in which the maximization of short-term interests yields outcomes leaving all participants worse off than feasible alternatives.

Hardin's 1968 article represents the most influential statement of pessimism about social dilemmas. Ostrom (2008) interprets Hardin as arguing that users of common-pool resources are trapped in a situation of inevitable tragic overexploitation because he did not envision them capable of collaboration and self-organisation to devise sustainable use. According to Ostrom's interpretation, the dilemma presented by Hardin operates at two levels. The first-level dilemma is organising to establish who are authorised users and what their respective rights and duties are. The problem remains, however, that all benefit regardless of whether they contribute or not. Anyone, then, can claim the rights associated with a public resource without upholding the associated duties. The second level of the dilemma is getting "out of the trap", which entails ensuring that all who benefit contribute. "Thus, extensive free-riding is predicted in most efforts to self-organize and govern a resources as a community of users" (Ostrom 2008, 2). Ostrom focuses her attention on the first-level dilemma of ensuring effective self-organisation.

3 Design principles characterise the broader institutional regularities among the management systems of collective-pool resources that were sustained over a long period of time (Ostrom 2009).

4 Importantly, what Ostrom found is that monitoring was optimally effective when it was self-devised and self-imposed: "externally imposed regulation that would theoretically lead to higher joint returns 'crowded out' voluntary behavior to cooperate" (Ostrom 2009, 426).

5 Hardin makes it explicit that he is using "necessity" in the Hegelian sense: "Freedom is the recognition of necessity" (Hardin 1968, 1248).

Ostrom's research uncovers many more positive outcomes, stressing that, instead of either government management or the privatisation of common resources, there is a broad array of polycentric management schemes for resources held in common found across the globe that entail overlapping jurisdictions, with multiple decision-making centres that have proven to be effective at averting the tragedy of the commons. Her research, then, challenges in particular Hardin's supposed unqualified emphasis on property rights and government regulatory leviathans as solutions (Boyd et al. 2018). She points to the fact that there is increasing evidence that central regulation has often accelerated resource depletion and is exacerbated by corruption and inefficiency (Ostrom 2008). While she contends that "Hardin incorrectly presumed that most common-pool resources were open-access resources where property rights had not been well-defined" (Ostrom 2008, 3), what is in actual fact the issue for both Hardin and Ostrom is not the ownership status of the commons,⁶ but rather the rationality informing the actions of common-pool resource users. Empirical evidence, she contends, attests to the fact that these users invest considerable time and energy conceiving practicable institutions for governing and managing common-pool resources. Mutual obligations and reciprocity are crucial conditions, however. They will follow mutually agreed upon rules at whatever cost might be involved in monitoring each's conformity and sanctioning failure to do so. The group size of common-pool exploiters/investors is only relevant to the extent that it inversely affects the factors that influence the likelihood of resource users themselves developing institutions for sustainable use, such as long-term investment, homogenous interest in terms of similar technologies, skills and cultural views of the resources, and the cost involved in communication – which is a crucial condition for reaching binding and enforceable agreements (Ostrom 2008).

Of importance for public policy is her discovery that "humans have a much more complex motivational structure and more capability to solve social dilemmas than posited in earlier rational-choice theory" (Ostrom 2009, 435), which is based on the assumption of egoistic, self-interested individuals who maximise utility.⁷ So, how then does she conceive of a human motivational structure that seeks to optimise collective interest when there is a clash between short-term individual interest and long-term collective interest? In short, what accounts for cooperation in social dilemmas, particularly in the context of managing common-pool resources?

Cooperation in common-pool dilemmas

Ostrom (1998, 9) departs from a general theory of human behaviour, which she contends is consistent with all models of rational choice,

that views all humans as complex, fallible learners who seek to do as well as they can given the constraints that they face and who are able to learn heuristics, norms, rules, and how to craft rules to improve outcomes.

She foregrounds *reciprocity* as a particularly critical norm, that is, "individuals tend to react to the positive actions of others with positive responses and the negative actions of others with negative responses" (Ostrom 1998, 10). Reciprocity, then, would be a crucial indicator of the success or failure of the optimisation of collective interest in social dilemmas.⁸ According to Ostrom (1998, 10), there is significant proof attesting to the fact that humans have a strong inherent ability or predisposition to learn reciprocity norms and social rules, which improves their chances of

6 As Ostrom (2008, 4) points out, "[t]he 35th anniversary of the publication of Hardin's original article was celebrated with a special issue of *Science*...demonstrating that all forms of ownership could succeed or fail and that more critical than the form of ownership was the establishment of legitimate and agreed-upon boundaries that were effectively enforced". Boundary rules are some of the most important types of rules, and determine who has rights and responsibilities and what territory falls under the jurisdiction of which governance unit.

7 Apart from finding significant levels of cooperation in common-pool resource dilemmas, Ostrom and her colleagues also found support for early theoretical predictions based on full rationality in "sparse environments" "where individuals do not know one another, cannot communicate effectively, and thus cannot develop agreements, norms, and sanctions" (Ostrom 2009, 419).

8 Unsurprisingly, Ostrom and her colleagues found that "[t]he opportunity for repeated face-to-face communication was extremely successful in increasing joint returns" (Ostrom 2009, 424).

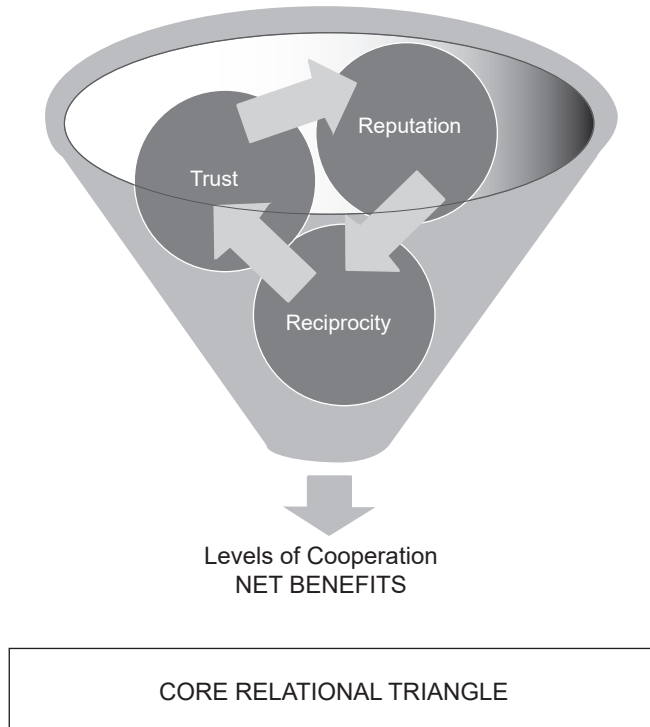


Figure 1. Ostrom’s core relational triangle

benefiting from various social dilemmas. Ostrom (1998, 12) references research indicating that when many people practise reciprocity, it creates an incentive to build a *reputation* for honouring promises and undertaking actions with immediate costs but long-term benefits. This reputation for keeping promises fosters *trust*. Ostrom (1998; citing Dasgupta 1997) defines trust as the expectation that one person has regarding the actions of others, which influences their own choices when they must act before knowing what the others will do. Therefore, Ostrom presents a behavioural explanation that centres on the connections between the trust that individuals place in others, the effort others invest in maintaining trustworthy reputations, and the likelihood that participants will adhere to norms of reciprocity. Levels of trust, reciprocity, and reputations for being trustworthy are positively reinforcing: if initial levels of collaboration are relatively high, mutual trust in each other is reinforced, which, in turn, encourages more people to follow reciprocity norms. As more individuals practise reciprocity, investing in a trustworthy reputation becomes more advantageous. Rather than directly explaining cooperation levels, this approach connects structural variables to a core triangle of trust, reciprocity and reputation, which then influences cooperation levels and net benefits – as depicted in Figure 1 (Ostrom 1998).

To demonstrate how structural variables influence the likelihood of collective action (cf. Figure 2), Ostrom (1998) presents a theoretical scenario: a small group of ten farmers, each with similarly sized farms, share a creek for irrigation. Each year, they organise a collective workday to clear debris from the creek, ensuring a steady water supply. All ten farmers plan to continue farming indefinitely and therefore have a vested interest in cooperation. However, they have more profitable opportunities for their labour than participating in the collective effort, which makes free-riding tempting. That said, the benefit of participating in the collective effort outweighs the cost for each farmer. Given the small group size, the equal distribution of assets and resources, the low cost of

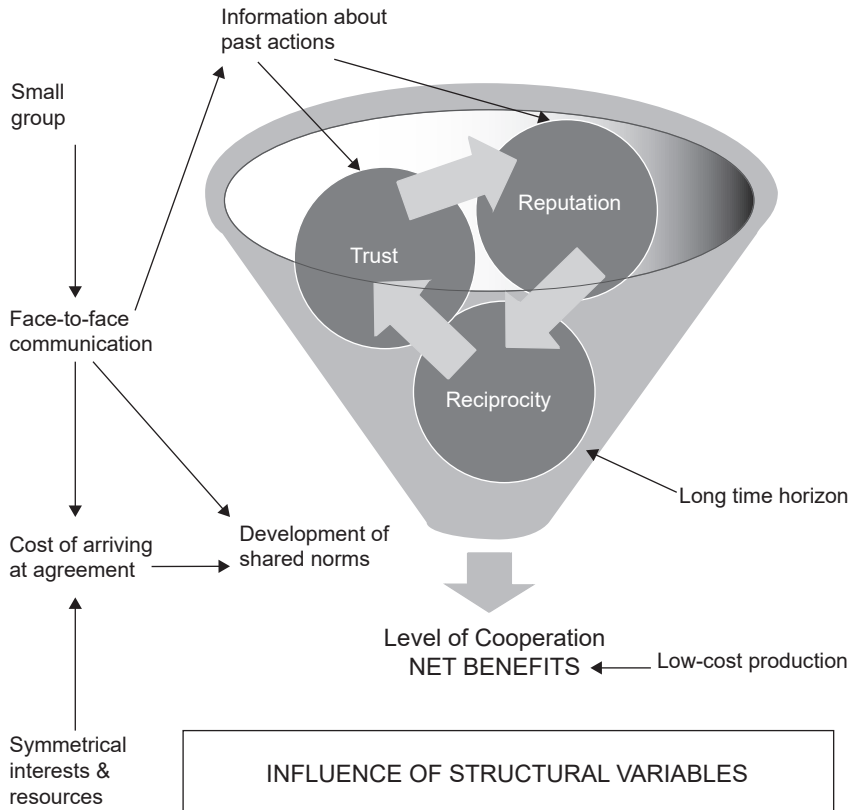


Figure 2. The influence of structural variables on the likelihood of collective action

providing the public good, and long-term collective outlook (structural variables), it is likely that most individuals will cooperate and resolve the dilemma. The prediction is supported by both field and experimental research. However, a change in any structural variable affects this prediction. For instance, if five farms are sold to a developer for future housing, the reduction in group size creates asymmetry in interests and resources. This example demonstrates the complexity of making simple predications or bivariate hypotheses about the impact of one variable on cooperation levels. Notably, this smaller group is less likely to cooperate than the original group of ten farmers, which contradicts the standard view on the effect of group size. “What the research on social dilemmas demonstrates”, writes Ostrom (1998, 16; emphasis added),

is a world of *possibility* rather than of *necessity*. We are neither trapped in inexorable tragedies, nor free of moral responsibility for creating and sustaining incentives that facilitate our own achievement of mutually productive outcomes. We cannot adopt the smug presumption of those earlier group theorists who thought groups would always form whenever a joint benefit would be obtained. We can expect many groups to fail to achieve mutually productive benefits due to their lack of trust in one another or to the lack of arenas for low-cost communication, institutional innovation, and the creation of monitoring and sanctioning rules...Nor can we simply rest assured that only one type of institution exists for social dilemmas, such as a competitive market, in which individuals pursuing their own preferences are led to produce mutually productive outcomes.

The key problems faced by new institutions hoping to facilitate collective action are to design new rules, motivate participants to conform to those rules of their own accord – on account of conviction as opposed to coercion – and find and appropriately punish transgressors without resorting to the “grim trigger” strategy or a “tit-for-tat” approach, for which no evidence was found (Ostrom 1998; 2009).⁹

The most urgent research questions for Ostrom’s second-generation models of human behaviour pertain to how structural variables impact the likelihood of achieving effective collective action. Given that structural variables are numerous, co-dependent and co-determining, it would be impossible to relate them in one large causal theory. What she proposes instead is

the development of coherent, cumulative theoretical scenarios that start with relatively simple baseline models and then proceed to change one variable at a time. (Ostrom 1998, 16)

This approach does not lead to the global bivariate (or even multivariate) predictions that have been the supposed ideal and which may be made based on, for example, Hardin’s prediction that freedom in the commons to breed (i.e. population density [the independent variable {predictor}]) inevitably brings about the ruin of all (i.e., resource depletion [outcome]). What her approach foregrounds is that any predictions that can be deduced will inevitably be “complex, interactive, and conditional” (Marwell and Oliver 1993, 25; cited by Ostrom 1998, 16).

Pessimism or optimism? Size matters

While Hardin’s prediction is simple but pessimistic, Ostrom’s approach yields complex but optimistic predictions. In fact, she “dedicated much of her career to demonstrating how commons in the real world had not and do not inevitably lead to tragic ruin” (Frischmann et al. 2019, 212). Size matters, however, in a critical respect. While Ostrom’s critique of Hardin seems to hold in the case of “small-scale, locally governed commons, which have been relatively insulated from external factors and rapid state of change” (Araral 2014, 15), Hardin’s pessimism is particularly justified when considering large-scale – national, regional and global – commons. National commons are confined to a country’s sovereign territory, such as China’s Yellow River. Regional commons span multiple countries, like the Mekong, Nile and Ganges Rivers. Global commons are resources beyond the jurisdiction of any single country or group of countries. A key characteristic of these commons is the relative difficulty of barring access to the resource system compared to local commons. Although the theoretical challenges of local and global commons are alike – such as the potential for free riding, congestion, overexploitation, credible commitment issues, and difficulties in monitoring and enforcement – Araral (2014) makes a compelling case that the larger scale, higher transaction costs, nature of the stakeholders, and the resulting complexity of collective action problems justify a pessimistic outlook for large-scale national, regional, and global commons. Ostrom’s (2007) diagnostic scheme helps explain the divergent dynamics at play in local and global commons. While the actors in local commons are individuals, in global commons the primary actors are nation-states, represented by political figures aiming to maximise their constituencies’ interests to ensure their political survival. In the neoliberal global order, as we know, political survival depends on a nation-state’s ability to facilitate the market’s unfettered operation to optimise economic self-interest at whatever cost. This reality makes it extremely challenging – though not entirely impossible – for nation-states to find common ground and cooperate in conserving global and regional commons. The situation with the Mekong River, where China, controlling the headwaters, continues to defy the Mekong River Commission’s rules by building dams and harming its ecosystem in its part of the Mekong, for example, exemplifies the challenge of regional commons cooperation amid asymmetric power dynamics. Given the accelerated rate of degradation and exploitation compared to the relatively slower pace of renewal or replenishment of these commons, Hardin’s pessimism appears theoretically justified (Araral 2014).

Stern (2011) offers a credible theoretical explanation for why cooperation in global resource commons differs from local commons. He distinguishes between local and global commons based

⁹ Resorting to the imposition of severe, uncompromising and sustained punishment on someone who fails to cooperate does not in practice deter non-cooperation, but undermines stable, long-term cooperation in repeated social dilemmas.

on factors such as geographic scale, number of users, awareness of and rate of resource degradation, distribution of interests and power, cultural and institutional homogeneity or heterogeneity, practicability of learning and ease of understanding resource dynamics, and the stability of those dynamics. Stern then highlights the difficulties in implementing Ostrom's design principles when it comes to global resource commons, which include creating rules that match ecological conditions, defining boundaries for resources and users, ensuring rules are monitored and enforced, managing the size of user groups, addressing the disconnect between resource users and those adversely affected by such use, and maintaining the credibility of scientific information among stakeholders, among other challenges. In essence, Stern convincingly argues that Ostrom's design principles fail to offer governance solutions to the challenges posed by global open-access commons, which effectively limits Ostrom's optimism to local commons. Although tragedy is not entirely inevitable, cautious optimism is highly conditional. Araral (2014) lists several examples of tragedies of the global commons, including the unregulated use of the global atmosphere and oceans as a global rubbish bin. While it is possible that competing parties might eventually forge a cooperative solution, the likelihood of developing resilient and durable governance agreements for the global commons is significantly lower than the rate at which the common-pool resource units and systems are being degraded and replenished. Again, here one could cite China's unwillingness to submit to the rules of the Mekong River Commission in South-east Asia, which has been around for 52 years. This example highlights the core dilemma of collective action for global commons in the presence of hegemonic stakeholders or rising powers such as China. Araral (2014) is adamant, however, that the failure to extend Ostrom's optimism from local to global commons does not diminish her legacy as a leading thinker in the study of the commons. Ostrom's more significant legacy lies in establishing a highly successful international research agenda that identifies the complexities associated with effective common-pool governance, as well as the key conditions and institutional design principles that define resilient and enduring commons. Ostrom (2007) invariably opposed the assumption that scholars can create simple, one-size-fits-all, predictive models of social-ecological systems that would somehow deliver universally applicable solutions or panaceas for the problems of unsustainable resource exploitation or destruction irrespective of the multiple variables characterising particular commons. She urged scholars to move beyond simplistic market and Leviathan solutions, and to forge diagnostic capabilities to address "complex, multivariable, nonlinear, cross-scale, and changing sociological systems" (Ostrom 2007; cited by Araral 2014, 17). Stern (2011, 229), a recognised authority on global commons, maintains that

one of the enduring contributions of Ostrom's *Governing the Commons* to the problems of global commons can be an expansion of thinking beyond the usual policy approaches of regulatory command and control, government intervention in market pricing systems, and formal agreements among national sovereigns.

Conclusion

The standard interpretation of the Hardin-Ostrom debate posits them as diametrically opposed in their perspectives on the management of common-pool resources and their proposed solutions to the challenges of resource governance. Ostrom's work challenges Hardin's pessimistic view of human behaviour and the inevitability of the tragedy of the commons. Her empirical research demonstrates that under certain conditions, communities can overcome collective action problems and effectively manage common pool resources through diverse, self-organised, decentralised institutions that draw on local knowledge and social norms. Hardin's solution to the tragedy of the commons has been interpreted to favour top-down, centralised control mechanisms, such as government regulation and privatisation, which implies that external intervention is a necessary condition to prevent resource depletion. For her part, Ostrom advocates for polycentric governance systems that are characterised by multiple layers of authority and decision-making at local, regional, and national levels. She argues that decentralised governance structures that entail active participation and cooperation among resource users are often more effective in managing common-pool resources sustainably. She foregrounds the significance of local knowledge, adaptive management, and community-based solutions tailored to the specific contexts of resource use.

In the intervention in the debate that I have offered, I have argued for a more nuanced reading of “The Tragedy of the Commons” that challenges the general consensus that Hardin’s call to enclose the commons for ecological protection advocates the alignment of market economics with environmental stewardship. By shifting the hermeneutic focus from the “commons” to “tragedy”, I have made a case that Hardin cannot in fact be read as having meant that only the efficiencies generated by market competition can force economic actors to act with the discipline necessary to ensure optimal exploitation of environmental resources. Quite to the contrary, Hardin criticises the capitalist logic of optimising self-interest through a cost-benefit analysis in an unenclosed commons. Privatisation would not protect the commons from this capitalistic rationality; instead, it would expose it to unrestricted market competition, which views development as the relentless pursuit of limitless growth.

I have argued that his endorsement of enclosure should be interpreted as advocating for increased public control over scarce and unmanaged resources, especially when these resources are being exploited by market forces. A corrective of the conventional interpretation remains critical even today – almost fifty years after the publication of his essay – given the fact that it became the “scientific” basis for World Bank and IMF policies promoting the enclosure of the commons and the privatisation of public property, and continues to influence contemporary climate change scholarship that supports market mechanisms such as carbon trading, carbon taxes, the payment of ecosystem services, and green bonds as the best way to ensure environmental protection. These market mechanisms create financial incentives for companies and individuals to reduce their environmental impact, treating the symptoms through the same means responsible for environmental destruction – the capitalist rationality geared towards limitless growth. Far from a panacea, as Ostrom stressed, market solutions suffer from several problems. Cap-and-trade systems, for example, are vulnerable to market fluctuations, which can undermine the stability and predictability needed for long-term investments. Market mechanisms can also disproportionately affect lower-income populations if not designed with equity considerations in mind. For example, carbon taxes can be regressive unless offset by measures such as rebates or targeted support for vulnerable groups. Market mechanisms may also not cover all sectors or pollutants, potentially leaving significant environmental impacts unaddressed.

Hardin, then, locates the tragedy of the commons not in the property status of the commons, but in the freedom to pursue individual profit without limit. This is roughly equivalent to the supposition in rational choice theory that individuals are rational agents who make decisions that best serve their own self-interest. For her part, Ostrom contends that Hardin’s diagnostics were partially correct and partially incorrect. In contexts with a low-density population, the herdsmen’s behaviour might align with the predictions of rational choice theory. However, when their shared well-being is at stake and resources are limited, Ostrom found that the herdsmen have a natural tendency to go beyond that rationality through self-regulation, which does not require top-down government intervention or privatisation. Ostrom’s extensive empirical research shows that this mutually agreed upon self-regulation is based on the application of a number of design principles that include clear boundaries, self-imposed rules and monitoring, sanctions, conflict-resolution mechanisms, and nested layers of governance. Rather than being diametrically opposed, here her position aligns with that of Hardin in his insistence on the necessity of “mutual coercion, mutually agreed upon by the majority of people affected” (Hardin 1968, 1247). While Ostrom incorrectly takes for granted the standard interpretation of Hardin’s tragedy of the commons consisting in the herdsmen being stuck in a prisoner’s dilemma, neither, then, are concerned with the ownership status of the commons, but rather with the rationality informing the actions of common-pool resource users.

While Ostrom challenged the inevitability of tragedy that Hardin sketched, her optimism is qualified and highly conditional. Upholding mutual obligations and reciprocity which fosters trust and builds trustworthy reputations are critical conditions for effective bottom-up common-pool resources governance – conditions which in turn depend on cost and ease of communication among users. In other words, she theorises a human motivational structure that seeks to optimise collective interest when there is an opposition between short-term individual and long-term collective interest as centred on a foundational triangle of three critical, mutually reinforcing norms – reciprocity, trust, and reputation. Although conditional and subject to the potentially adverse effects of multiple

structural variables, she makes the strong claim that humans have a powerful *innate* ability or predisposition to learn reciprocity norms and social rules, which substantially increases their chances of benefiting from social dilemmas. She is decisive in her dismissal of the claim that there is only one type of institution for social dilemmas – a competitive market – in which individuals pursuing their own interests are led to generate mutually productive outcomes. While Ostrom’s theory is cautiously optimistic, it does not offer simple solutions such as the supposed ideal of global bivariate (or even multivariate) predictions exemplified in Hardin’s insistence that freedom in the commons to breed (i.e. population density [the independent variable {predictor}]) inevitably brings about the ruin of all (i.e. resource depletion [outcome]).

Importantly, however, Ostrom’s cautious optimism contra Hardin’s decisive pessimism seems to hold only in the case of small-scale, locally governed commons that have been protected from external factors and rapid change. Hardin’s pessimism appears warranted in the case of large-scale commons, such as the global atmosphere and oceans, where it is relatively more difficult to bar access to them, and the collective action problems are significantly more complex, especially in cases where they involve rising or hegemonic players, such as China or the US, and power dynamics among users are asymmetric. While Ostrom’s design principles fail to provide governance solutions to the challenges posed by global open-access commons, her 2007 diagnostic scheme does illuminate the divergent dynamics at play in local and global commons, which opens the door for the next generation of common-pool resource researchers to continue her groundbreaking legacy in contributing to the broadening of thinking beyond the conventional regulatory command-and-control approach, formal agreements among national sovereigns, and government intervention when it comes to the global commons.

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