

Dynamics of the climate dilemma



- Despite a growing focus on climate change from governments around the world, carbon emissions continue to rise.
- To understand why little progress has been made, we must first conceptualise the problem and its core elements.
- For example, what dynamics of trust and cooperation shape human attempts to combat climate change? How does climate change represent a social dilemma? And how have social dilemmas been resolved in other areas?
- Dr Erling Berge, professor emeritus at the Norwegian University of Life Sciences, responds to these questions using policy examples from Norway's rich history.
- He is shedding new light on past failures and future possibilities for tackling this pivotal threat to life on this planet.

Since the 1980s, the United Nations has enacted numerous conventions to reduce and prevent the pollution of our oceans and atmosphere. Yet, despite these acts, plastics and other contaminants continue to pose a threat to sea life, while CO₂ emissions have seen a 60% increase between 2018 and 1990.

Earth's oceans and atmosphere represent open-access resources, with no authority willing or able to effectively restrict their use and abuse. There are many reasons for the failure to tackle such threats to the climate. Within nations, businesses and sectors most responsible for climate emissions hold significant political power, which they wield to delay policy measures that would diminish

current profits. Meanwhile, *between* nations, action is often stalled by the argument that since others do little, why should we do more? This makes the challenge of achieving collective action on controlling pollution a 'social trap', one similar to the 'prisoner's dilemma'.

In the hypothetical 'prisoner's dilemma', two criminals are imprisoned and put in solitary confinement. While police lack sufficient evidence to convict the pair on a higher charge, they are both confined for

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one year on the basis of a lesser charge and simultaneously offered a bargain. If either testifies on their partner, they may be freed while the other is imprisoned for three years on the principal charge. However, if both testify each will serve two years. This presents a dilemma in which betrayal ensures – at minimum, a less negative outcome than what would be encountered by staying silent. And yet, cooperation is the only option that can distribute a fair cost between both prisoners. The hypothetical dilemma thus represents the challenge of making enforceable promises to cooperate, when a system builds the temptation to defect into each actor's self-interest.

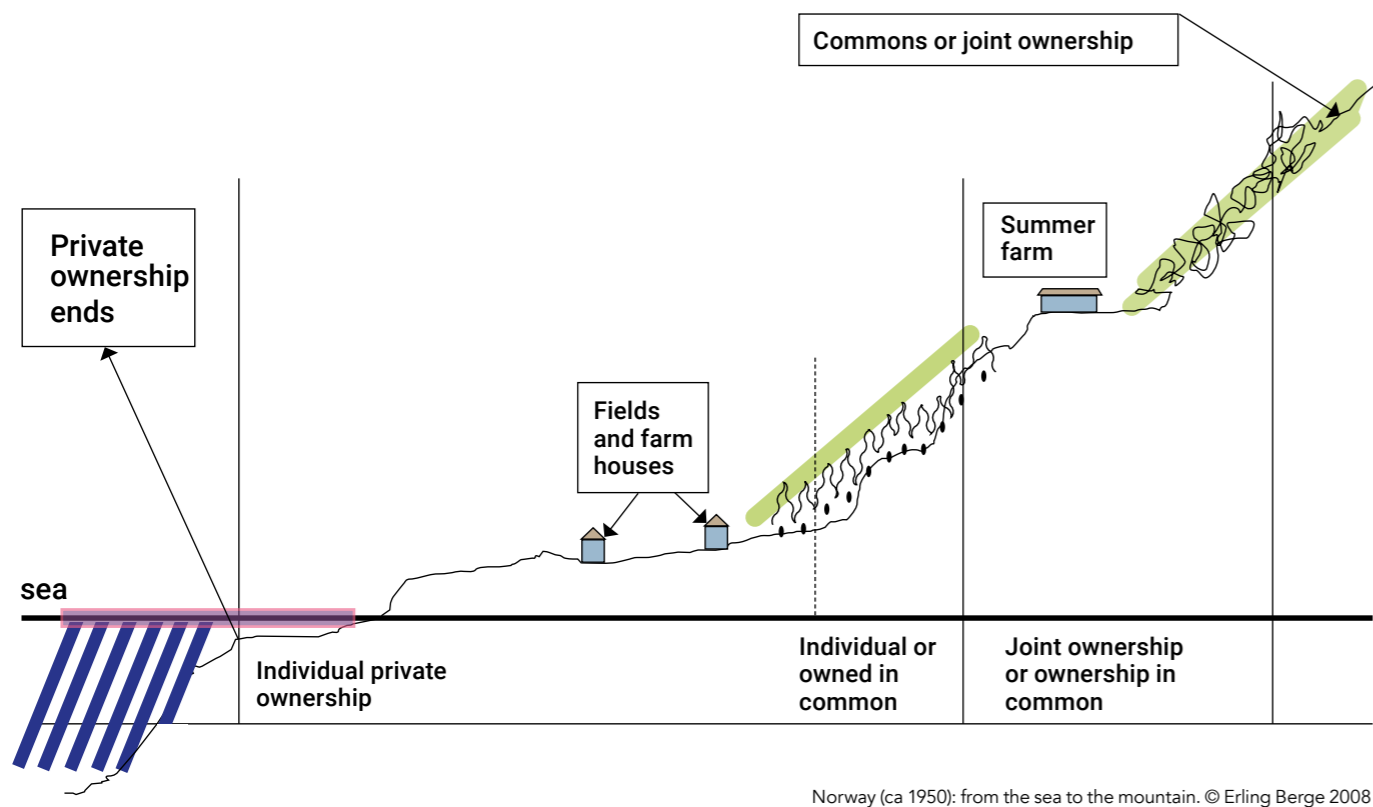
More than an abstract model

Game theory is the field of study that investigates hypothetical dilemmas such as the prisoner's to predict and transform how scenarios unfold in real-world contexts. In this case, game theory seems to predict that nations will defect on their United Nations promises to reduce and prevent pollution, destroying the open access resources (often mistakenly called the commons) – their shared environment – and bringing tragedy for all players. However, it is important to note that game theoretic models are abstractions, and in their underlying assumptions and focus on specific variables, they fail to account for nuances of the real world. For example, such models often assume actors are entirely rational and will make decisions that reflect complete knowledge of all the associated benefits and drawbacks. Yet, rationality and the availability of information vary according to the context and the individuals involved.

Empirical studies on social dilemmas reveal that people around the world have managed to organise the exploitation of their common resources while avoiding their depletion or destruction. These accounts demonstrate that factors such as interpersonal trust, group size, and communication strategies all shape behaviour in ways that simplified models fail to predict. Indeed, Dr Erling Berge, Professor Emeritus at the Norwegian University of Life Sciences, reveals how such factors have determined the success or failure of previous attempts to resolve dilemmas of cooperation in the exploitation of a common resource in Norwegian history. In so doing, new insights on present struggles and future possibilities for collective action on climate change are brought to the surface.

Rules and sanctions

According to Berge, one example for the



resolution of a dilemma of the commons is the pre-Viking village system. In this community, individually owned fields would be made open for feeding all livestock both in early spring before the sowing of cereals, as well as after their harvest in autumn. The private owners would benefit from this collective use of their fields since livestock would loosen their soil and leave some fertilizer. These benefits would remain so long as cattle are moved to the outfields before sowing season and no user left their cattle beyond this point to exploit the land. Moving cattle at the same time would also benefit all by requiring fewer hands to herd. The problem of collective action lies in avoiding free riders, both in being too late or too early in moving out of the fields in spring, and in being too early in herding livestock back home.

Berge traces the solution to the cattle-herding dilemma in subsequent Norwegian legislation. For example, since the Viking era a type of community assembly called the bygdeting held the power to develop local rules and a system for judging rule breakers, including those concerning the movement of cattle. From these assemblies, a regional law known as the code of Gulating was established, dictating rules for moving cattle, including a deadline for their herding to pasture, an earliest date for taking the animals home, as well as sanctions for code violations.

Triggered by tragedy

However, another historical case study from Berge demonstrates that a system of rules and sanctions is not sufficient to resolve dilemmas of the commons. Housefires had become a problem of the settled areas by the 10th century, when neighbourhoods had become more densely populated. Since buildings were made of wood, fires could rapidly engulf entire neighbourhoods until a wide street prevented

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further spread. Accordingly, the earliest urban code, Bjarkøyretten, counted an individual causing a fire that burned down a neighbour's house among the most serious crimes. Additionally, free riders who relied on others preventing their fires while not investing in their own safety would come under pressure, since their neglect threatened the public good of fire protection.

Rules such as those mandating the possession of tools for stopping fire is found in the first urban code and refined in successive iterations. Requiring that streets must be built to be broad enough to prevent a fire from spreading was a point of dispute between authorities and homeowners. In fact, it was almost impossible to prevent homeowners from rebuilding their homes as they were before a fire. However, after the fires of 1476 and 1527 in Bergen (Norway's largest city at the time), some building lots on the waterfront were successfully left empty for fire protection, indicating that when a tragedy is felt as close or on the top of people's minds, collective action may be taken more readily even when personal interests collide. But note that rules related to monitoring and sanctions did not work immediately.

Reflections on the current crisis

The historical case studies offered by Berge give us insight into Norway's historical responses to social dilemmas of the open access resource and the public good and how these reflect dynamics still present in our current crisis. Firstly, to prevent free riders and to protect public goods, a common good requires a system of rulemaking and sanctioning, built by a community assembly with the power to uphold such measures. The local commons has to be created. However, as the example of fire protection demonstrates, even if rules are necessary, they are not sufficient for ensuring the desired outcomes. Indeed, this can be seen in the limited successes of the United Nations to encourage nations to limit their pollution.

We may conclude from past legislation in Norway that if a tragedy is near enough, rules are coming forth – but not necessarily their enforcement. Instead, new technologies might help us protect the commons.

Personal response

What key lesson can we draw from Norwegian legislative history to resolve this present and most profound dilemma of an open access resource?

The Norwegian legislative history demonstrates that rules arising from people's experiences are effective. The rules governing the social dilemma of pasturing on infields originated from people's experiences and were enacted by the bygdeting – a community assembly that was eventually amalgamated into the Gulating. The law code of Gulating is known to be older than 930. This law was in force until Magnus the Lawmender's law of 1274 was enacted, which lasted until 1604. The rules governing the dilemma of pasturing on the infields in this 1274 law code were basically the same as in the oldest known law code of Gulating, and the law book of 1604 and 1687 contained mostly the same rules as the 1274 law code.

The Norwegian legislative history confirms the game-theoretic analysis of dilemmas in collective action: one needs a rule system and a system for monitoring and sanctioning rule breakers. It also shows that people will act to hold on to their current belongings – eg, after a fire, people hastened to rebuild their houses on the same spot they stood before, thus preventing the expansion of streets. In the theory, this is called loss aversion. Making rules that take account of this tendency has proved difficult.

In our studies of oceans and atmosphere, it is important to take note of the difference between an open access resource and a commons. A commons is an open access resource with a community creating rules for its exploitation, a system of monitoring, and power to sanction those breaking the rules. Before the commons has been created, one cannot talk of free riders. The world community using our oceans and our atmosphere has started fashioning rules and monitoring use. Enforcing rules seems to be far away. But we are allowed to start thinking of these resources as global commons.

Beyond this, I am not sure one can find much advice in history. The game-theoretic analysis of social dilemmas has, however, provided

evidence of people being strong reciprocators. Most people will cooperate in games where defection might give higher individual rewards. But it also shows that there always will be a few free riders hoping to profit from the collaboration of all the others. But if we confine our interest to states and companies, the hope for strong reciprocation may be misplaced.

Our current problems concerning the global commons are in two respects very different from our historical experiences of local commons. Both the pollution of our oceans and the destruction of our climate are slow-moving processes with local variations in impact on people both geographically and over time. There is also a considerable time lag between human activity and unwanted consequences. The slow coming of unwanted consequences makes it difficult to muster popular support for rules limiting the actions producing the unwanted consequences. This will more or less ensure that when action finally comes, it may be too late. In addition, based on our knowledge of free riders, for example oil producers postponing action one more year, the rules must be designed to stop them. I know no historical example of this having been achieved.

Climate scientists warn that we are rapidly approaching or even may have passed several turning points after which human action will have marginal impact on the trajectory of temperature, ocean increase, wind speed, and amount of precipitation. Action is urgently needed, even if what one may achieve is only a reduction in the speed of deterioration.

From studies of collective action there are examples of wealthy actors that produce public goods from their own funds. One might hope that some wealthy actors and large contributors to the emission of climate gases (say, China, India, and the USA) will want to protect the climate more than they want the profits from waiting. But action has to be taken sooner rather than later. In the final analysis I think the prudent action is to prepare our societies for the warming climate and the increasing levels of oceans.

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Dr Erling Berge is professor emeritus of property rights institutions at the Norwegian University of Life Sciences. He has worked on problems in demography and urban and regional development, with a focus on theory of land tenure systems. During 2002–2004, he was president of the *International Association for the Study of the Commons*

(IASC), and in 2004 he co-founded the *International Journal of the Commons* together with Tine de Moor.

Further reading

- Berge, E, (2023) *How can "tragedies of the commons" be resolved? Social dilemmas and legislation*. *CLTS Working Papers* 1/23, Norwegian University of Life Sciences, Centre for Land Tenure Studies.
- Berge, E, (2024, in press). *How can "tragedies of the commons" be resolved? Social dilemmas and legislation*. In: Jones, M, Strecker, A, Setten, G, Mitchell, D, (eds) *Landscape, Law and Justice – 20 Years*. Stockholm: Kungl. Vitterhets Historie och Antikvitets Akademien (KVHAA) (The Royal Swedish Academy of Letters, History and Antiquities).



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