

INTERNATIONAL PROTOCOLS REGARDING GLOBAL CLIMATE CHANGE AND THE IMPACT ON WATER RESOURCES

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Summary

Climate change is by its very nature a global challenge that can only be met through the coordinated efforts of all nations. Arriving at an effective and equitable international agreement that achieves the necessary emissions reductions is one of the greatest efforts to institutionalize international cooperation. Such agreement should be based on the principles of environmental integrity, cost-effectiveness and equity. The process, which led to the Montreal Protocol, serves as a framework for negotiating concerted response to climate change amidst scientific uncertainty. It is predicted that water resources will be among the vulnerability areas adversely impacted by climate change. Therefore, the success of the Kyoto Protocol to mitigate climate change or to induce action that would contribute to adaptability and response capabilities is of great concern to the water sector. Some of the implications of climate change on water should be addressed by following an integrated approach that recognizes the linkages between international agreements.

1. Introduction

Along with oceans (high seas), the seabed, outer space and Antarctica, the atmosphere is a global commons. The term global commons denotes the idea of a resource that no single entity has exclusive titles to or, in terms of the current international order, no state has exclusive jurisdiction over. Apart from the fact that it is physically impossible for any one state to extent control over the atmosphere, there is also a deeper meaning to the term global commons, namely that there is an interconnectedness between the planet's ecosystems that goes beyond state borders. The interdependence of the global commons and their various resources are especially evident when it comes to global climate change. Global climate change became an issue of political concern in the 1980s when scientists correlated the increase of emission of greenhouse gasses due to human activities in the atmosphere with climate changes and concluded that future climate disasters may be awaiting humanity if levels of greenhouse gasses do not stabilize. The current political and institutional framework that exists to address a global problem such as climate change does not reflect the planetary interdependence. Mechanisms that are born from the idea of collective stewardship over the commons are necessary to address climate change. Several mechanisms of this sort have been established with respect to global climate change, notably the United Nations Convention on Global Climate Change (UNFCCC) and the Kyoto Protocol. One of the vulnerability areas that are impacted by climate change is that of water. In this regard, the potential success of climate change protocols are dependent on their ability to institutionalize international cooperation in mitigating climate change and therefore preventing the adverse effects thereof on water resources, as well as creating cooperation with respect to adapting to climate change.

2. The Need for International Protocols: The Tragedy of Global Commons

The tragedy of the commons is a metaphor, which Garret Hardin (1968) coined to indicate that commons are prone to disaster. Using the example of a pasture where herdsmen may freely graze their cattle, he explains that this may work to the benefit of everyone as long as the number of cattle allowed to graze there does not exceed carrying capacity of the pasture. When this point is reached, the incentive of the herdsmen generates tragedy. Because each herdsman receives all the profit from his sale, but all those who use the pasture share the negative effects of overgrazing, the incentive of individual herdsmen would be to rear more cattle. The long-term effects of a depleted pasture are outweighed by the short-term profits of rearing more cattle. Compounding the problem is the distrust in other herdsmen and the belief that they would engage in "free riding" by not exercising restraint to the joint benefit of limiting the amount of cattle to sustain the pasture. A herdsman has no guarantee that others would not exploit his restraint by adding more cattle. The rational herdsman is thus locked into a prisoner's dilemma. These three ideas – the tragedy of the commons, the problem of free riding and the prisoner's dilemma – mirror themselves on the international arena when it comes to global commons in the following way. The rational self-interested actors are mostly states and their economic development is related to the use of global commons, whether distracting from common pool resources, such as fish stocks or using common resources as waste disposal systems or common sinks, such as emitting certain gasses into the atmosphere.

To avoid the tragedy of the commons, Hardin proposes two solutions, namely enclosure

or coercive action. Enclosure implies private as opposed to public/common ownership, because individuals can be trusted to use their land effectively and sustainably. However, global commons are very difficult to enclose and if attempted, may lead to the exclusion of others or the so-called “tragedy of dispossession”. Coercive action implies that an authoritative body exercises coercive measures that would force actors to use commons in keeping with what is within the limits of sustainability. In the absence of a truly global (supranational) authority, which could decide on and enforce coercive measures over and above the sovereignty of states, the best alternative is for states to institutionalize cooperation. The eventual form of institutionalized cooperation depends on the constellation of interests of the parties sharing the global commons. Although the pasture analogy assumes that there is equality between herdsmen, this is normally not the case when it comes to global commons, which should be seen within a global political and economic context.

The atmosphere and climate change illustrate the need for, but also the difficulty of negotiating institutionalized cooperation in order to avert the tragedy of a global commons. Climate change became an issue of political concern as the scientific evidence of human interference with the climate system increased and this was coupled with growing public concern over global environmental issues in the mid-1980s. Although there is still a measure of uncertainty, some climate scientists predict that if emissions continue to grow at current rates, it is almost certain that atmospheric levels of carbon dioxide (CO₂) will double from pre-industrial levels during the 21st century and the level of greenhouse gas emissions will triple by the year 2100. The effects predicted if this should happen include:

- global warming of about 2 °C between 1990 and 2100.
- the earth's average sea level is predicted to rise by about 50 cm by 2100;
- total precipitation is predicted to increase;
- more rain and snow will mean wetter soil conditions in high-latitude winters, but higher temperatures may mean drier soils in summer;
- an increase in the frequency and intensity of extreme weather events such as storms and hurricanes; and
- rapid and unexpected climate transitions.

In fact, reports produced by the Intergovernmental Panel on Climate Change (IPCC) suggest that many of these climate changes have already commenced. It is suggested that these changes correlate with the amount of greenhouse gasses in the atmosphere and an enhanced green house effect. It has been suggested that global climate change signifies that the atmosphere has reached the limits of its carrying capacity as a global sink for greenhouse gasses. Although climate change may also have beneficial effects, the adverse effects are of such a grave nature that it spurred action from governments and the public.

The greenhouse gas emissions of a country correlate with its gross domestic product (GDP) and thus its economic growth. As the tragedy of the commons analogy predicts, states (as rational actors) have an economic incentive to continue to add to their emissions for they profit from this action in the short-term, while the negative (long-term) effects, such as climate change, are shared by all other states and future

generations. This clearly highlights the need for measures to institutionalize cooperation in mitigating climate change (or bringing the emissions of greenhouse gasses within the limits that can be sustained by the atmosphere). The negotiations of the protocols that are to embody the common norms and cooperative arrangements between states on the reduction of greenhouse gas emissions are complicated by three factors, namely firstly the **uncertainty of climate science**. Some climate scientists offer a dissenting view to the occurrence and causes of climate change, arguing that:

- there has always been climate variability and that current climate change is part of the natural variability and not a need for alarm; and
- current climate changes are not the result of human activities, such as burning fossil fuels or depleting natural sinks, such as forests, but a result of sea currents, the sun or other natural phenomena.

Secondly, although there have been recent manifestations of climate change, the fact that the bulk of adverse consequences may only be visited on future generations results in a **lack of immediacy**, which may inhibit the urgency with which actors deal with the problem.

Thirdly, there exists **inequality** among the actors sharing the atmosphere as a global sink. As such, a distinction between developed and developing countries can be made based on:

- their emissions of greenhouse gasses into the atmosphere and thus their responsibility for climate change; and
- the extent to which they are affected by climate change and able to adopt and cope with climate change.

Given these complicating factors, arriving at an effective and equitable international agreement that achieves the necessary emissions reductions has become among the greatest diplomatic challenges ever faced.

3. The Different Climate Change Protocols Operating in the International System

3.1. The Montreal Protocol

Although the Montreal Protocol was primarily established to protect the ozone layer, it can be seen as a precursor to the international efforts focusing specifically on climate change for three reasons. Firstly, the Montreal Protocol covers some of the greenhouse gasses that cause global climate change, secondly its focus is also on the atmosphere as a global commons and thirdly, the process that led to the negotiation and subsequent renegotiation of the Montreal Protocol has provided a paradigm for future global environmental agreements where the scientific basis for action is initially uncertain, as is the case with climate change. The problem of ozone depletion attracted political concern from as early as the 1970s when it was proposed that chlorofluorocarbons (CFCs) – an increasingly versatile class of industrial chemicals – are broken down in the stratosphere to release catalysts (Chlorine atoms), which destroy ozone. As a result

increased levels of ultra violet radiation reaches the Earth's surface and in turn causes increases in skin cancers and other health and environmental damages. However, there was at least a 10-year period of intense scientific confusion. The discovery of the hole in the ozone over Antarctica and the confirmation that it resulted from CFCs stimulated the international efforts in the 1980s. At a meeting of 33 countries and the European Commission in Washington in 1977 the Coordinating Committee on the Ozone Layer was established, which met annually up to 1985 and prepared reports for policymakers on ozone research. In 1985, after several efforts by first Norway and then the Toronto Group (consisting of the US, Canada, The Nordics, Austria and Switzerland) to get countries to include control measures of CFCs in an international agreement, the Vienna Framework Convention was signed. It did not include control measures, but empowered the United Nations Environment Program (UNEP) to convene working groups that would negotiate a protocol to be signed in 1987. Such as protocol was indeed signed in Montreal and substantially amended in 1990 in London and in 1992 in Copenhagen.

The Montreal Protocol stipulates that the production and consumption of compounds that deplete ozone in the stratosphere, chlorofluorocarbons (CFCs), halons, carbon tetrachloride, and methyl chloroform, are to be phased out by 2000 (2005 for methyl chloroform). The protocol also puts measures in place that would assist developing countries in phasing out CFCs. These are:

- an ozone fund that would pay the incremental costs of developing countries in meeting their control obligations; and
- a pledge that technology necessary to meet their obligations will be available to developing countries on fair and favorable terms.

The Protocol therefore recognized that industries in developing countries were not responsible for the problem, but could nullify international efforts to rectify the problem if they do not intend to phase out their emissions of ozone depleting gasses. The technical and financial incentives to join were strengthened by provisions that would restrict trade with non-parties to prevent signatories circumventing control measures and to ensure that non-parties do not take advantage of parties' compliance.

The Montreal Protocol was based on several principles that added to its success at institutionalizing cooperation to solve a global problem, namely:

- The lack of certainty was not employed as a restraint on prudent action. To deal with uncertainty, the principle of a 'framework' that established the problem and an international commitment to address it in a subsequent protocol emerged. The protocol would be designed in such a manner that it could be updated and amended to respond to scientific changes. Thus the principle of an interim protocol that took precautionary action despite uncertain science was established;
- The regulatory approaches that set timetables for the limitations of ozone depleting substances sent a signal to the market to stimulate research and development into substitutes for these substances;
- In relation to target setting the protocol induced the idea of regions and countries setting targets that go beyond what is legally required of them, not so much as a

- sign of altruism, but to gain commercial advantage; and
- From the beginning of the negotiations, it was acknowledged that some form of North-South compensation was to take place.

In other words, the Protocol acknowledged principles of environmental integrity, cost-effectiveness and equity.

The negotiation process also benefited from the fact that public opinion was sufficiently mobilized in the major CFC producing and consuming countries to provide an incentive to solve the problem. In the US, the company that co-invented CFCs, Du Pont, spent millions annually to develop substitutes that would not have the damaging effects on the ozone. The US public reduced their consumption of CFC drastically and the US government banned the use of CFCs in spray cans before any international initiatives required it.

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Biographical Sketch

Joelien Pretorius is a senior lecturer in Political Studies at the University of the Western Cape (UWC) and completed her PhD at the University of Cambridge in the UK. She has written on the social and ethical applications of technology in international relations.