9 Ethical Issues and Climate Change

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Human–induced climate change is widely regarded as one of the greatest – if not the greatest – moral challenges of the 21st century. Not merely does it raise numerous ethical issues, but many of these are profoundly difficult and take us to the limits of our moral imagination. Moreover, the ethical dilemmas posed by climate change arise at multiple levels – for citizens, scientists, policy makers, organisations, companies, nation states and the international community – and traverse many different areas of moral inquiry.
Among the more notable questions are the following:

- What is the nature and extent of our responsibilities to future generations?
- What is the value of individual species and ecosystems, and how should we value the possible extinction of millions of species?
- How should we make decisions in the face of uncertainty, including the possibility of catastrophic and irreversible damage to our planet?
- What criteria should be used to determine the appropriate targets for the stabilisation of greenhouse gas concentrations in the atmosphere?
- Who should pay for the inevitable costs of climate change mitigation and adaptation, and to what extent, if at all, should those who suffer the negative impacts of climate change be compensated?
- How should the international community respond if certain sovereign states block effective global action or refuse to contribute fairly to the collective effort?

Such questions have significant ethical dimensions because they involve conflicting interests among different people and nations, and address the issues of right and wrong, good and bad, or justice and injustice. To complicate matters, in some cases many different ethical principles or imperatives are at stake, with several of these in direct conflict. Accordingly, difficult policy trade-offs arise and the most ethical course of action may be hard to discern.

It is only possible in this short paper to address a few of the ethical issues posed by human-induced climate change. Hence, the focus here is on three key issues: our responsibilities to future generations; the appropriate discount rate to use when considering the economic costs and benefits of policy options to address climate change; and how the costs or burdens of mitigation and adaptation should be shared.

Responsibilities to Future generations

There are well established ethical grounds for asserting that human beings have significant responsibilities to future generations. From a utilitarian perspective, for instance, if the aim is to maximise total human welfare or net happiness over time and if each individual's utility is given equal weighting, then decision makers using a utilitarian calculus are obliged to consider how their actions will affect the welfare of both present and future generations. But this approach raises difficult analytical and ethical issues. One of these concerns the time period over which any such calculation should be undertaken.

If no limit is imposed, potentially there could be an infinite number of future human beings whose utility requires consideration. On this basis, hardly any weight can be attached to the utility of the present generation. Yet if a time limit is imposed, thereby restricting the number of generations who are deemed to be relevant for policy purposes, what criteria should be used to determine where the limit is drawn? A related issue is whether the utility of every person, regardless of when they are born, should be valued equally or whether some form of discounting should be adopted (see below).

While many utilitarians affirm humanity's duty to protect the interests of future generations, so too do many of the great religious traditions. From a Judeo-Christian standpoint, for example, human beings are deemed to have a divinely mandated obligation to be wise stewards of the created order and protect our collective inheritance. In accordance with this approach, creation is regarded as an extraordinary and precious gift – one to be nurtured and cherished, not unduly exploited and/or damaged for individual and short-term gain. Hence, human beings do not own this planet (let alone the cosmos) but rather hold it in trust for future generations, with all the connotations usually associated with a fiduciary duty – that is, good faith, a high standard of care, prudent oversight and wise management. From this standpoint, the biblical commandment to love our neighbours as ourselves needs to extend over time as well as space; unborn generations of humanity are also our 'neighbours'; they deserve our love and concern, not only those living here and now.

In keeping with these ethical traditions, efforts have been made over recent decades to give legal expression to our duties to future generations. This has included various provisions in international treaties and declarations, as well as national and sub-national legal instruments – constitutions, laws and regulations. Many of these documents recognise the interests of future generations in having access to a clean and healthy environment and place specific, and demanding, duties on present generations to protect the environment for those who will inhabit Earth in the future.

With respect to climate change the most important international agreement – the United Nations Framework Convention on Climate Change – states that the parties must 'prevent dangerous anthropogenic interference with the climate system' (Article 2) and 'protect the climate system for the benefit of present and future generations of humankind' (Article 3). This includes an obligation on the parties to take 'precautionary measures to anticipate, prevent or minimise the causes of climate change and mitigate its adverse effects' (Article 3). Moreover if 'there are threats of serious irreversible damage' the parties have an obligation to take action even when 'full scientific certainty' is lacking (Article 3). In pursuing mitigation measures, however, the parties are required to ensure that 'economic development' can proceed in a sustainable manner' (Article 2). The aim, in other words, is to ensure that the needs and interests of those currently alive are protected 'without compromising', to quote the Report of the World Commission on Environment and Development in 1987, 'the ability of future generations to meet their own needs'.

Discount Rates

Closely related to the issue of our duties to future generations is the question of what discount rate should be applied when assessing the economic and non-economic costs and benefits of policy options to mitigate climate change. The notion of discounting implies that a cost or benefit experienced in the future is valued less than the same cost or benefit occurring today. Hence, if a very high discount rate (e.g. 10% per annum) is employed, an investment which earns, say, $10,000 in a decade's time will be deemed to have far less value than the same return enjoyed right now. Currently, economists, philosophers and others disagree on what discount rate should be applied in climate policy analyses, with the

very different views strongly influenced by competing ethical assumptions. Much is at stake in this debate. For instance, if a relatively high discount rate is adopted (e.g. around 6% as recommended by William Nordhaus, a leading American economist), then the negative impacts of climate change on future generations become largely irrelevant for policy purposes. Indeed, even catastrophic impacts, resulting in huge economic and ecological damage, do not matter if they occur far enough into the future. By contrast, if a relatively low discount rate is adopted (e.g. 1.4% as proposed by Lord Nicholas Stern), then the negative impacts of climate change over the next few centuries will carry much more weight in any cost-benefit analysis. To illustrate, goods valued at $1 million today will be worth a mere $2,479 in 100 years' time if discounted at 6%, but almost 100 times more – $246,597 – if discounted at 1.4%. Put differently, using a 6% discount rate implies that one would be prepared to outlay no more than $2,479 to avoid a loss of $1 million in 100 years' time.

Such differences are highly significant in policy terms because of the temporal asymmetry in the costs and benefits of early action to mitigate climate change. Whereas most of the costs are borne by the current generation, most of the benefits (in the form of reduced negative impacts and thus lower adaptation costs) are enjoyed by future generations. Hence, if a high discount rate is adopted, the long-term benefits of early action are likely to appear small relative to the up-front costs. If, however, a low discount rate is adopted, then the long-term benefits will be significantly greater and early action will be much easier to justify. Not surprisingly, therefore, the use of different discount rates yields divergent policy prescriptions: Nordhaus rejects the case for ambitious early action to reduce greenhouse gas emissions, while Stern strongly supports such action.

While the issue of discounting is critically important from a policy perspective, so too is the question of which particular costs and benefits should be included in any analysis and what monetary value should be placed on non-market goods and services, such as individual species and the ecosystem services they provide. Various methodologies have been advanced in order to determine the monetary value that should be attached to specific non-market goods and services, including the willingness of people to pay for the particular goods or services in question. But the different methods often generate radically different valuations and each approach is open to serious ethical objections.

Burden Sharing

At the global level, perhaps the most daunting ethical issue is who should bear the cost of mitigating and adapting to climate change. The United Nations Framework Convention on Climate Change states that the parties should address climate change on the 'basis of equity and in accordance with their common but differentiated responsibilities and respective capabilities' (Article 3). But 'equity' is not defined and nor is there guidance in the Convention on how the parties' responsibilities should be 'differentiated'. The respective literatures on distributive and retributive justice provide useful guidance on such matters, including a range of relevant principles. Let me mention a few of these principles – all of which, of course, are open to objections and many of which are in conflict.

Equality

As applied to mitigation, the principle of equality might be taken to imply that all individuals have an equal right to emit greenhouse gases. Hence, unless there are offsetting considerations, all countries should receive equal per capita emission allowances. This principle underpins the strategy of contraction and convergence – through which the per capita emissions of all nations are designed to converge (at, say 1-2 tonnes per annum) by 2050.

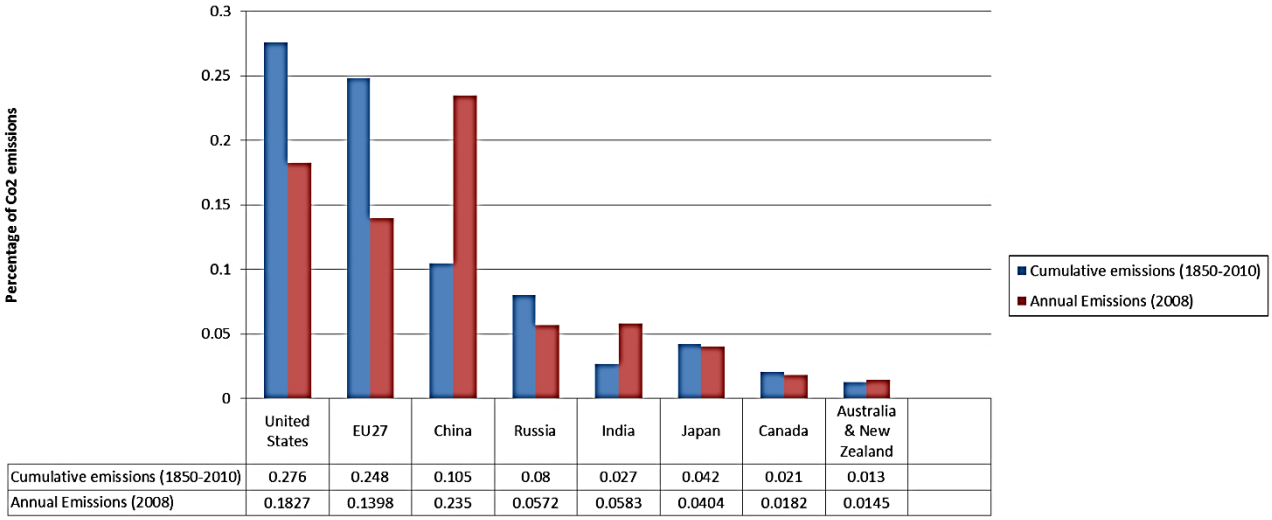
Capacity or ability to pay

The principle of capacity holds that those who have greater capacity to reduce their emissions and/or pay for the costs of adaptation should be required to bear the greater proportion of the burden. In practice, this implies that countries with a high per capita GDP should reduce their emissions by more than those with a low per capita GDP, and contribute a larger share of the costs of adaptation. For instance, if there were to be a large global fund designed to cover most of the adaptation costs, then the contributions of the various countries would be based on a formula which took into account their per capita GDP and the size of their population. Of course, in practice addressing the costs of adaptation raises complex policy issues, not least those of attribution (i.e. which damaging weather events are due, at least in part, to climate change?) and distribution (i.e. who should receive international assistance and on what basis?). Even with a well-designed and properly resourced global adaptation fund, much of the burden of adapting to climate change will be difficult to share; it will be borne instead by those who have the misfortune to suffer the worst impacts of climate change, and many of these people will be relatively poor.

Historical Responsibility

The principle of historical responsibility (or the notion of polluter pays) requires countries to make an effort to address climate change that is proportional to their responsibility for causing the problem. In practice, this means that countries that have been larger contributors to the current stock of greenhouse gases in the atmosphere should take on proportionately larger emission-reduction commitments and a larger share of the costs of adaptation. But such an approach raises questions about the timeframe over which emissions should be calculated and the weighting that should be given to cumulative emissions versus current (and/or expected future) emissions (see Figure 1).

Figure 1: Cumulative and annual carbon dioxide emissions by country



	United States	EU27	China	Russia	India	Japan	Canada	Australia & New Zealand
Cumulative emissions (1850-2010)	0.276	0.248	0.105	0.08	0.027	0.042	0.021	0.013
Annual Emissions (2008)	0.1827	0.1398	0.235	0.0572	0.0583	0.0404	0.0182	0.0145

Source: based on the dataset EDGAR 4.2 FT2010 (Emissions Database for Global Atmospheric Research)

Need

The principle of need appeals to the fact that individuals have little choice but to produce a certain minimal quantity of greenhouse gas emissions simply to survive. It is not clear, however, how this principle should be applied in practice. It might be used to ensure that all countries are granted a subsistence level of emission rights or that the poorest countries are granted a certain per capita allocation of emission rights.

Monetary Costs

In order to achieve emission reductions at the least cost globally, the marginal costs of such reductions need to be equalised across countries. Potentially, this could be achieved by means of a globally integrated emissions trading scheme. Such an arrangement is likely to be regarded as unfair by many people because the per capita costs faced by individual countries will be inconsistent with the principles of capacity, historical responsibility and need. Nevertheless, greater consistency could be secured by providing free allowances and establishing other compensatory mechanisms that take into account the relevant differences between countries while still achieving overall allocative efficiency.

Conclusion

The question of what to do about climate change is fundamentally an ethical one. The natural and social sciences can assist in identifying the causes and consequences of climate change as well as assessing the costs and benefits of various responses.

But such analyses cannot tell us what we *should do;* this requires a moral judgement. Such judgements will depend on a range of ethical principles and considerations, not least the weight we place on the interests of future generations and the protection of endangered species, what discount rate we consider appropriate, and how we think the burdens of mitigation and adaptation should be shared – both now and in the future.

References and further reading

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This paper was peer reviewed by Dr Andy Reisinger, Deputy Director (International), New Zealand Agricultural Greenhouse Gas Research Centre. While the reviewer has provided comment on drafts of this article, he does not necessarily endorse it in its final form. The author is solely responsible for any errors and judgements that may exist in the published article.

v.1.1, 7th July 2016