Introducing the Climate Change Debate

Climate Change and Responsibility to Future Generations: Reflections on the Normative Questions

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Climate change raises in an important way the problem of moral responsibility. It forces us to recognise that we have a responsibility to future generations, and to ask what this responsibility implies. Here I identify four key normative questions: (1) How should we respond to uncertainty? Should we apply cost-benefit analysis in order to cope with uncertainty? (2) How should we evaluate the emission of greenhouse gases? Given that the effects of emissions will be bad, should we judge that we as emitters harm the receivers and by that do them an injustice? (3) How should we compare present costs and future benefits? Should we give little or much weight to the benefits and well-being of people in the further future? (4) How should we take heed of human rights? Should we try to avoid the adverse outcomes of a cost-benefit approach by adopting a human rights approach that specifies minimum thresholds to which all human beings are entitled?

The Problem

Our attitude to climate change is not one of indifference. Our motto is not 'Nach uns die Sintflut!', meaning that it does not matter what happens after we have gone. One thing that militates against this indifference is the belief that we have a responsibility to future generations. If we share this belief we will have to think out what responsibility to future generations implies in view of climate change. I believe that if we want to deal with this problem and if we are to determine what responsibility to future generations implies, we need to consider what normative questions we should ask about climate change and what our response to them should be.

How Should We Respond to Uncertainty?

Let me start by sketching the problem of uncertainty. According to some climate scientists, the Earth's climate has developed a progressive warming of the atmosphere, and they explain this warming as being caused by humanity's emissions of greenhouse gases, starting with the Industrial Revolution. The theory merits a high degree of credibility as compared with alternative explanations and it allows certain predictions about the future climate. Its broad predictions such as, for instance that the world will continue to warm and that the sea level will continue to rise, are widely supported. But when it comes to more detailed predictions of the future impacts of greenhouse gases, we are faced with a great deal of uncertainty. There are two reasons for this. First, the climate system is so huge and complex that its behaviour can only be predicted by making many assumptions and approximations. Second, the future progress of climate change will be influenced by many external factors, for instance by how much the human population grows and how technology develops. Uncertainty with regard to more detailed predictions is a great problem when we think about how we should act in response to climate change. For we are unsure what the effects of climate change will be, and we are equally unsure what will be the effects of our action in response to it.

How should we cope with this uncertainty? One important theory recommends that we should use cost-benefit analysis with the aim of maximizing expected value. Let me briefly explain this recommendation. It means, essentially, that what we should try to maximize is expected value - our expectation of the goodness of the world. So in a situation of uncertainty, we will need to calculate expected value. We can do this by applying cost-benefit analysis. In principle, the expected value of an action can be calculated in the following way. We first identify the different results the action might have and we then judge the value and the probability of each of the possible results. For each result, we calculate the arithmetical product of its value and its probability. Then we add up all these products. The sum of this calculation gives us the expected value of the action.

However, in practice, this reasoning confronts us with a problem. To calculate the expected value, we need to know both the value and probability of each of the possible results, but in practice, we do not have that knowledge. The question is what we should do, and the answer can only be that we must try to estimate values and probabilities as well as we can.[1] Let me take probabilities first. What probability we should assign to a possible result is a matter of rationality. We should ask how much credence we rationally should give to the possibility that the result will occur. The answer must depend on the evidence we have. The more evidence we can muster, the more tightly the evidence will determine the probability. When it comes to estimating the value of each possible result, we have to weigh good features against bad ones, that is to say, we have to apply cost-benefit analysis to each of the possibilities separately. Each possibility will lead to the world's developing in some particular way. For instance, people's well-being will improve or diminish in a particular way. We have to set a value on this development.

What does this approach imply with regard to climate change? Its main implication is this. In order to calculate the expected value of our actions in response to

[1] See, for example, John Broome, *Climate Matters: Ethics in a Warming World* (New York/London: W.W. Norton, 2012), p. 187.

climate change, we need to estimate their results. Our actions - including doing nothing - can have bad results, therefore described as 'costs', or they can have good results, called 'benefits'. We have to weigh the costs against the benefits and we have to take account of costs and benefits both to the present generation and to future generations. In short, using cost-benefit analysis implies comparing the costs of an undiminished progress of climate change with the costs and benefits of combating climate change. Such weighing up is needed for making out which course of action would be best on balance.[2]

Should we adopt the cost-benefit approach? If we reflect on this question, we should take into account that there is disagreement about the application of cost-benefit analysis to the issue of climate change. On the one hand, cost-benefit analysis has been taken to offer a tenable response to uncertainty about how to cope with climate change. On the other hand, it has been criticized for being inappropriate for assessing the problem of climate change. Critics have argued as follows. Cost-benefit analysis is tied to a conventional economic framework and can within that framework be useful for evaluating competing projects by directly assessing their costs and benefits. But the problem of climate change has a long-term nature and goes beyond the conventional economic framework. Therefore, it is inappropriate to apply conventional cost-benefit analysis to it. This criticism can be illustrated by two instances. First, critics argue that conventional cost-benefit analysis is overly simplistic in talking about costs and benefits accruing to people in the far future. It neglects the problem that projecting costs and benefits in the long-term future is a difficult, if not impossible task, because we do not know precisely what the global economy will look like in the further future, what technological and social changes will occur, and what the specific negative effects of climate change will be.[3] A second criticism is that conventional cost-benefit analysis undervalues the costs and benefits accruing to future people. In conventional calculations, these costs and benefits are subject to a positive discount rate. This means that they count as less than current costs and benefits and that over very long time periods they disappear or become minimal. But such results seem absurd. To illustrate the absurdity of a substantial discount rate, Stephen Gardiner offers this example: 'At the standard 5% discount rate, the present value of the earth's aggregate output discounted 200 years from now is a few hundred thousand dollars.'[4]

In face of the disagreement about the application of cost-benefit analysis to the issue of climate change, the question of whether we should adopt this approach at all requires considerable thought. It may, for example, lead us to ask whether we might be able to reach a tenable response to uncertainty by modifying the approach, for instance by focusing on the basic conditions of the life of future people?

How Should We Evaluate the Emission of Greenhouse Gases?

The broad predictions of climate science give rise to the value judgement that the effects of the emissions on human beings will be bad. For example, farming in the tropics will be

[2] *Ibid*., p. 101.

[3] See, for example, Stephen M. Gardiner, *A Perfect Moral Storm: The Ethical Tragedy of Climate Change* (Oxford: Oxford University Press, 2011), p. 237.

[4] *Ibid*., p. 268.

damaged by a rise in temperature; drought will be severe, particularly in Africa; coastal areas will be subject to flooding and erosion as the sea level rises; many people's health will be damaged and many people will be killed. Should this evaluation of effects lead us to the further evaluation that the emitters of greenhouse gases harm the receivers and by that do them an injustice?

This question is about what we are doing when we emit greenhouse gases. It concerns our morality as private persons. Its background is the moral claim that we have duties of justice, and it calls upon us to judge whether, by emitting greenhouse gases, we are breaching a duty of justice. Let me start by sketching the background. That we have duties of justice is part of our common-sense morality and of many moral theories. Duties of justice are owed by one person to another particular person, or to other particular people. If we breach a duty of justice, we are doing an injustice, and there is always some particular person to whom it is an injustice. In our social and cultural context, one important example of a duty of justice is the duty not to harm other people.

Given this background, how should we judge our emissions of greenhouse gases? Are there sufficient reasons for stating that, by emitting greenhouse gases we are harming other people and thus doing them an injustice? Let me mention some important reasons in favour of that view that have been presented in the literature.[5] (i) The harm caused by our emissions is a result of what we do, for instance heating flats, driving cars, rearing cattle. (ii) The harm we do is not trivial but serious. (iii) This harm is not accidental since it is often the predicted result of deliberate acts of ours. (iv) We do not compensate the victims of our harm. These victims are huge numbers of people scattered all over the world. (v) We normally create our greenhouse gas emissions for our own benefit. We benefit, for example, from the comfort of our homes, the travelling we do, or the consumer goods we buy. (vi) The harms done by the emissions of the rich are only to a small degree balanced by the emissions of the poor. (vii) If we are not among the very poor who have to burn fuel to survive, we could easily reduce our emissions.

For all these reasons it can be concluded that when we as rich people emit greenhouse gases without compensating the people who are harmed, we act unjustly. This conclusion leaves us with a problem. Each of us is under a duty of justice not to emit greenhouse gases without compensating the people who are harmed as a result. If it is impossible for us to make this restitution, then our carbon footprint ought to be zero. But how could we satisfy this requirement? Looking for a solution, we might consider the following proposal. Since it is the case that we cannot entirely avoid causing emissions even if we take steps to reduce them, we should try to cancel or offset these emissions. We could do this by taking preventive measures to ensure that less greenhouse gas gets into the atmosphere. Many organizations use our money to finance projects that diminish emissions somewhere in the world, to create sources of renewable energy, or to promote the efficient use of energy. To the extent that we are able to offset all our emissions in these ways, we would cause no greenhouse gas to be added to the atmosphere, and we would do no harm to anyone through emissions.[6]

These aspirations cannot be expected to provide a short-term solution. Hence, the next question I want to raise here concerns the very long timescale concerned.

[5] See Broome, pp. 55-59.

[6] *Ibid*., pp. 79 and 87.

How Should We Compare Present Costs and Future Benefits?

The changed climate will persist for a very long time. The emissions of greenhouse gas cause a progressive warming, and if that gas is carbon dioxide, the warming is spread across centuries, because some of the gas will stay in the air that long. The warming of the atmosphere harms many presently living people, but most of the bad effects will not be suffered for many decades from now, or indeed for more than a century from now. They will be suffered mostly by people who are not yet living. Their lives will be much worse than they would have been if we had controlled our emissions. Likewise, efforts to control climate change will only slowly become effective. For example, the reduction of greenhouse gas emissions will result in benefits within a few decades, but most benefits will come only after a very long time.

Measures to reduce emissions of greenhouse gas are costly. The costs of such measures will be borne at present or in the near future. Therefore, the question arises how we should weigh up costs borne by present people against future people's benefits. The answer seems in the first place to depend on what value we should set on future people's benefits compared with our own.

In climate economics, this issue appears under the heading of 'discount rate'. Two prominent studies may illustrate this. The Stern Review uses a low discount rate (1.4 percent per annum). It discounts future benefits to a low degree, which means that it gives much weight to the interests of future people and asks the present generation to make urgent sacrifices for the sake of future people.[7] Nordhaus' study 'A Question of Balance' uses a high discount rate (5.5 per cent per annum). It discounts future benefits to a high degree, which means that it gives little weight to the future. It concludes that only a modest response now is demanded and strong action can be delayed for decades. [8] According to another commentator, the discount rates of Stern and Nordhaus make a sixty-fold difference to the value we assign to commodities a century from now.[9]

What value we should set on future people's benefits is not just an economic question but also a moral question, because it determines more than anything else what sacrifices the present generation should make for the sake of the future. How should we answer this question? Perhaps the following proposal is worth considering. Suppose we do not reject all discounting of future benefits. We may, for example, discount future commodities because of their diminishing marginal benefit. That is to say, we may share some of the economists' optimistic assumptions: The world's economic growth will continue, despite climate change and the present crisis; people in general will therefore be richer in the future than they are now; they will possess more commodities; since they already have a lot, extra commodities will bring them less well-being than extra commodities received by someone who has few. But discounting future commodities does not imply discounting future well-being, because well-being is not a commodity. 'Well-being' stands for people's lives going well, their possessing whatever is good for them as individuals (pleasure, satisfaction of their preferences, knowledge, or some other good).[10] What value we should set on the well-being of persons depends on our basic

[7] Nicholas Stern, *The Economics of Climate Change* (Cambridge: Cambridge University Press, 2007).
[8] William Nordhaus, *A Question of Balance* (New Haven: Yale University Press, 2009).
[9] See Broome, p. 139.
[10] *Ibid.*, pp. 113 and 129.

moral view. According to Broome, someone's well-being has the same value whenever it occurs, and whoever's well-being it is.[11] If we take this view, well-being should not be discounted. Commodities, that is the material goods people buy and the services they use, can be regarded as sources of well-being. They are benefits if they increase the well-being of persons. This implies that the discount rate for evaluating these benefits should be low.

How Should We Take Heed Of Human Rights?

The arguments advanced so far are not the only objections to a cost-benefit approach to climate change. It can also be criticized for its aggregative nature. This criticism is as follows. A cost-benefit approach is concerned with the aggregate level of expected value, the total wealth of current and future generations, and it neglects the plight of the very seriously disadvantaged if their plight is outweighed by the benefit of others. A cost-benefit approach fails to protect the basic interests and entitlements of the most vulnerable, and this is an important omission.

How should we try to avoid this adverse outcome? Should we agree with the important proposal recently advanced by Simon Caney and others that we should consider the impact of climate change on the fundamental human rights of people?[12] According to this view, anthropogenic climate change jeopardizes three key human rights: first, the human right to life: all persons have a human right not to be arbitrarily deprived of their life; second, the human right to health: all persons have a human right that other people do not act so as to create serious threats to their health; third, the human right to subsistence: all persons have a human right that other people do not act so as to deprive them of the means of subsistence.[13]

In underlining the status of these rights in this way, Caney draws attention to four properties of human rights.[14] First, human rights refer to those rights that persons have qua human beings. Second, human rights represent moral thresholds below which people should not fall, the most basic moral standards to which persons are entitled. Third, human rights represent the entitlements of each and every individual to certain minimum standards of treatment, and they generate obligations on all persons to respect these basic minimum standards. Fourth, human rights generally take priority over such moral values as increasing efficiency or promoting happiness. So, human rights specify minimum moral thresholds to which all individuals are entitled, simply by virtue of their humanity, and which override all other moral values.

This plea for human rights as thresholds is important in the debate over climate change. It may induce us to adopt a human rights approach to climate change. If so, we ought to consider how our approach can be brought to bear in public decision-making. If so, we might want to consider whether taking heed of human rights could, after all, go

[11] *Ibid*., p. 146.
[12] Simon Caney, 'Climate change, human rights and moral thresholds', in *Human Rights and Climate Change*, edited by Stephen Humphreys (Cambridge: Cambridge University Press, 2010), pp. 69-90.
[13] *Ibid*., pp. 75-82.
[14] *Ibid*., pp. 71-73.

together with some cost-benefit analysis, even though a human rights approach is normally seen as an alternative to a cost-benefit approach.

As an example to support the view that some cost-benefit analysis can be combined with taking heed of human rights, consider the emissions control system known as 'cap and trade'. This system is drawn up in cost-benefit terms. It attaches a price to emissions. The 'cap' is the maximum amount of greenhouse gas a country is allowed to emit. Each country divides its cap among its economic agents by allocating emission permits. The 'trade' is the buying and selling of permits. It occurs among the economic agents in an emission market. The cap is reduced from one period (often several years) to the next, thereby reducing total emissions over time. When the cap is tight, the emissions price will be pushed up and economic agents will find it profitable to economize on their emissions rather than buying lots of permits. Two recent evaluations of this emissions control system appreciate its virtue. They judge it to be 'almost the only deliberate climate-change policy to actually reduce emissions to any significant degree so far,'[15] and to be 'an effective means' to cut back carbon emissions sharply and aggressively 'by placing a price on carbon emissions'.[16] But they combine their appreciation of cap-and-trade with a human rights approach. They criticize the way the system treats the least advantaged. One evaluation criticizes the unequal distribution of wealth the system exacerbates, arguing that controlling greenhouse gas emissions leads to an increase in the cost of emission and that the impacts are worse for poorer households than for richer households. To avoid these impacts, it is suggested that, where emissions allowances are sold to firms, a portion of the revenues should be directed to providing compensation to poorer households.[17] A second evaluation focuses on the global poor. More than two billion human beings suffer from energy poverty. Their subsistence rights are not fulfilled. They need to be provided with access to energy, especially electricity. Cap-and-trade alone would simply make life worse for the poorest by driving up the price of fossil fuels. A plan is needed that could tackle energy poverty directly by driving down the price of renewable energy to a level that the poorest can afford.[18] In these evaluations of the cap-and-trade system, cost-benefit thinking is combined with taking heed of human rights.

Conclusion

I have argued here that if we want to clarify what responsibility to future generations implies in view of climate change, there are certain key normative questions that we will need to address about climate change and about our response to it. I have discussed four such questions: How should we respond to uncertainty? How should we evaluate the emission of greenhouse gases? How should we compare present costs and future benefits? How should we take heed of human rights? There are many more questions to

[15] Simon Caney and Cameron Hepburn, 'Carbon Trading: Unethical, Unjust and Ineffective?', *Royal Institute of Philosophy Supplement* 69 (2011), p. 227.
[16] Henry Shue, 'Climate Hope: Implementing the Exit Strategy', *Chicago Journal of International Law* 13:2 (2013), p. 398.
[17] Caney and Hepburn, p. 223.
[18] Shue, pp. 391, 396, 398.

be asked, but I hope the four questions I have discussed have provided a background for the debate addressed in this first issue of the journal *De Ethica*.

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