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Opinion on the Paris Conference, Compensation, and Climate Change

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Abstract

The Paris Climate Agreement of 2015 was silent about compensation for harms inflicted by carbon emissions of the past. But this silence cannot obliterate the obligations of the developed countries that caused these omissions to make reparations to affected developing countries. This article includes in its scope the grounds of these obligations and the forms that such compensation might take, and their relation to adaptation. By way of methodology, the authors employ both ethical analysis and the application of ethical findings to areas such as technology transfer and early-warning systems. They also argue that geo-engineering should not be included among the forms that compensation might adopt. The authors' aim is to foster among countries responsible for carbon emissions an enhanced awareness of imaginative ways in which the harms they have caused can be mitigated or ameliorated. The Agreement enshrines some modest but significant steps towards climate change mitigation and towards adaptation to climate change that either has happened already or unavoidably will happen. These steps, while insufficient, are likely to prove crucial in the struggle to combat climate change. Without them humanity and the planet would have been on course for disastrous increases of greenhouse gas emissions, and equally disastrous related impacts in the form of extreme weather events of ever increasing frequency. Even as things stand, there is a high risk of the flooding of coastlines and of small islands worldwide, while famine due to droughts has returned to several regions of Africa. Such flooding is ever more likely because of rising sea-levels, while droughts are among the severe weather events that climate change has made more intense and more frequent.

Introduction and Background Information

The Paris Agreement can be commended for recognizing "...the importance of averting, minimizing and addressing loss and damage ... associated with climate change", and of building "resilience to climate change impacts in developing countries" (1). If averting future loss and damage is important, so must also be the impacts of loss and damage of the period up to the present, and taking responsibility for them on the part of those who have generated them, little as the Agreement appears to have to say about this. Accordingly the subject of this essay is the relevance of past emissions, and particularly of emissions of the period since 1990 when it was known that greenhouse gases such as carbon dioxide were causing global warming, with all its attendant problems. The losses and damage caused by

past emissions open up a case for compensation owed to those suffering from their impacts by those who emitted these emissions.

The authors write this article not as specialists in climate change, but as an ethicist and a social scientist, concerned to emphasize the role of ethics in climate debates and policy decisions. Reports of the Intergovernmental Panel on Climate Change used to have no room for issues of ethics, but are latterly including sections that discuss ethical aspects of climate change. Meanwhile a literature has begun to build up of monographs, collections, reports and journal articles focusing on and developing climate change ethics. A prominent example is *White Paper on the Ethical Dimensions of Climate Change*, produced by the Rock Ethics Institute of Penn State University in 2006 by Donald A. Brown and his colleagues (2).

Before the authors turn to ethical principles and arguments, they want first to remind readers of the kinds of loss and damage that are in question as a result of greenhouse gas emissions. "Sea and ocean levels have risen, according to the consensus of IPCC and other scientists, will continue to rise as a result of past and present emissions, and will rise yet faster unless coordinated action is taken to reduce significantly the rate of emissions in future. Among further signs of climate change, ice caps and glaciers are beginning to disappear. New evidence has recently emerged of the reduced area of Arctic ice" (3). Similarly the Antarctic ice-sheet has been melting much faster than had been believed, with 36 cubic miles of ice lost every year (4).

Nor are these the only forms of climate disorder, current or foreseeable. Coastal cities and settlements all around the globe are at risk of inundation, and whole countries, such as Tuvalu and the Maldives, could largely disappear. Tropical diseases are spreading, as their vectors travel to higher altitudes and latitudes. Freak weather events such as hurricanes, droughts, wildfires and famines are becoming more frequent and more intense. Millions more people are finding themselves obliged to migrate from their previous homes as environmental refugees. Many species are moving further away from the equator, as their former habitats cease to support them, in some cases becoming stranded when potential habitats cease to be available (5).

Development of the Case for Compensation

The various impacts just mentioned have already involved losses and harms. Those affected include the millions of people who have become environmental refugees, whole countries that have been placed at risk, such as Tuvalu and the Marshall Islands, and also many wild species. Developed countries, whose wealth is in part ascribable to emissions as a by-product of industrial activity, have largely generated these impacts. Accordingly there is a case for compensation by these countries to the various affected parties. Wild species, of course, cannot directly be

compensated, but it remains possible to protect the habitats on which they depend. Meanwhile the affected countries mostly stand in need of assistance to adapt to the impacts of climate change, to make provision for environmental refugees, and to provide for the needs of their populations without at the same time exacerbating the problem of emissions through conventional energy generation.

The Paris agreement apparently makes no mention of compensation. But this was probably an understandable silence. For a text that ascribed responsibility for past emissions and committed the relevant governments effectively to reparations could well have had to be ratified by the United States Congress. But Congress might well have refused to ratify it, and thus could well have jettisoned the entire agreement. Since the attainment of this agreement may well have been crucial to the projects of mitigation and adaptation, that probably makes this a wise silence, as long as suitable actions and policies were put in place – though the fact that the United States announced in 2017 that it would leave the agreement for specious reasons renders this concern a moot point. The wider ramifications of this poor judgment on the part of the American executive branch remain to be seen.

The case for compensation, whether explicit or implicit, remains a strong one. Environmental compensation of a more local kind has been under discussion for decades, as in the writings of Richard Cowell (6). This case can be based on human rights, such as the right to a decent environment, and the right not to be deprived of one's livelihood through no fault of one's own (7). As with other human rights, it is to be assumed that anyone who knowingly and avoidably infringes these rights is under an obligation to rectify the situation and as far as possible to restore the right-holder to the condition in which they were before the infringement. Thus the conclusion would be supported that either relevant individuals or relevant countries owe compensation to the countries affected by such infringements.

While this kind of reasoning can prove persuasive, its conclusion has a restricted scope. Thus some adherents of the human rights approach take an individualist view of responsibility, and grant that responsibilities to compensate rest with the responsible individuals, and lapse with their deaths. But even if we adopt instead a collective view of responsibility, and accept that governments can be responsible for past policies, and that related obligations are inherited by the successors in government of those who caused loss or harm, the reasoning still appears to embody a backward-looking approach (concerning past infringements), and to be open to replies such as ones urging the greater importance of enhancing the future as compared with rectifying the past.

Accordingly it is worth mentioning that the reasoning that supports compensation need not be regarded as backward-looking only. For utilitarian and other consequentialists (theorists, that is, who make obligations turn on the consequences of acts or omissions) can maintain that compensation is just as socially beneficial as

certain other apparently backward-looking practices such as punishing and rewarding. For where it is recognised that knowingly and avoidably inflicting losses, harms or damages is liable to incur the costs of paying compensation, and this practice is seen to be commonly in force, then society (in this case global society) can proceed on the basis that infringements of laws or rules involving harms, damages or losses carry costly consequences and are to be avoided. There is in fact a future-oriented case for insisting on compensation, since there are large overall benefits to a system in which parties on whom losses have been inflicted are compensated; the case for compensation, which seemed to be backward looking and nothing more, turns out to have a much ampler justification than was initially apparent. Where such a justification is available, and an entire social and international system on which hangs much future benefit is at stake, there is a strong case for upholding this system, even where there are apparent benefits from infringing it.

Besides, there can be little doubt that the impacts of climate change are an example of losses or damages or harms for which compensation is morally in place, even if this case might perhaps not be recognised in international law. For the development and wealth of most developed countries has depended to a large extent on their emission of greenhouse gases, while the impacts of these emissions have largely, albeit not exclusively, been felt by developing countries in the form of hurricanes, floods, droughts, wildfires and territory lost to the seas. Compensation has actually been paid to the islanders of Nauru for the despoliation and loss of their territory through the mining of phosphates, which required them to migrate to Fiji; and thus the case for compensation in the weightier matter of devastating impacts of anthropogenic climate change has to be seen as a compelling one.

While there may well be conclusive reasons against explicit mention of compensation, and related rights and duties, in the Paris agreement, the moral case remains for the international community to act *as though* widespread compensation were due. Even though the very idea of compensation turns out to be unmentionable in such agreements, what is unmentionable may well be morally central, and, as such, should guide and mould the actions taken in the wake of the agreement.

Before to consider a further justification of compensation and also how compensation might work out in practice, an objection should be considered to at least the extent of the compensation due, and possibly to its being due in the first place. This objection concerns the unawareness or ignorance on the part of those emitting greenhouse gases that this is what they were doing, right from the beginning of the Industrial Revolution until quite recently. For it was not until around 1990 that there was a general recognition that human agency was causing climate change, and therefore that the use of (for example) fossil fuels was causing greenhouse gases to be emitted. But people who did not know what they were doing cannot be held responsible for the unforeseen effects of their actions.

This objection has considerable force, and suggests that the actions for which compensation is due, which are sometimes held to include emissions of the period from 1850 or even 1750 onwards, cannot reasonably be included in the moral case for compensation. But emissions have not gone into abeyance in the period since 1990, despite worldwide awareness that they were causing climate change; and so the objection has no force for the period from that date. It is true that the theory of man-made global warming had been put forward earlier, but the earlier period also was treated to theories of global cooling and other rival theories. It was not until roughly 1990 that there emerged a near-consensus among scientists that anthropogenic global warming was taking place. However, the emissions of the period since that date are not affected by the objection that we have been considering. Indeed they turn out to be much more serious than might initially be thought when their bearing of humanity's carbon budget is taken into account (8).

Even if the goal of limiting carbon dioxide levels to 2° Celsius above pre-industrial levels were the agreed goal (and of course the Paris agreement wisely went further, and agreed to aim at a limit of 1.5°), scientific research discloses that, for a 50% chance of achieving this unsatisfactory goal, humanity is limited to emitting (over the whole period from 1750, the true dawn of the industrial revolution, onwards) just one trillion tonnes of carbon (9). But more than 55% of this trillion tonnes has been emitted already, and if current rates of emission continue, the rest is likely to be emitted by a date in February 2044 (10). Hence, carbon emissions need to be drastically curtailed; indeed for a 75% chance of avoiding no more than a 2° temperature rise, the permissible total from 1750 must be limited to 750 billion tonnes.

However, humanity has continued to emit large quantities of carbon dioxide and other greenhouse gases since 1990, and for these emissions it can more obviously be held responsible. The emissions of this twenty-seven year period are likely to amount to well over one tenth of the 55% of humanity's carbon budget already consumed across the last 200 years, and this significant proportion of the carbon budget (somewhere between 5.5% and 8% of the all-time budget, and a much higher proportion of the all-time budget if the limit is a 1.5° Celsius increase above pre-industrial levels) cannot fairly be disregarded. China, it is true, is now the single largest contributor to carbon emissions, but that has not long been the case, and detracts but little from the responsibilities of the developed countries. Besides, the per capita emission rate of China remains quite small, which suggests that the case for compensation to the rest of humanity does not, as yet, apply to China. The authors are not suggesting that China has no moral role in curtailing emissions and attaining a lasting form of adaptation to our changed climate, but rather that the case for owing compensation applies to those countries that have for much longer been using up far more than their share of humanity's all-time greenhouse gas emissions budget or allowance.

These considerations suffice to show that proposals such as that the remaining greenhouse gas budget be shared out between countries on a per capita basis have become unacceptable. One of us used to support the stance of 'Contraction and Convergence' of which this was an implication. But citizens of countries that have used up more than their share of humanity's carbon budget cannot morally expect past emissions to be set aside and the remaining budget to be divided on an equal per capita basis. Instead, they are ethically bound to lead the way to a low-carbon future, and where carbon entitlements are in question, accept significantly smaller quotas than allocation on an equal per capita basis would generate.

It is time now to add a further strand of argument in support of the case for compensation. Thus it is widely agreed to be wrong to impose risks on others, particularly when those others have no ability to avoid them; this is uncontested in cases of reckless driving and of reckless endangerment of workers by factory owners, and should be equally clear in cases where the potential victims live further away from those who cause the risks, and are harder to identify. But this is the case where the emissions of developed countries impose increasingly severe and increasingly frequent weather events (such as droughts, floods, hurricanes and wildfires) on the peoples of developing countries. Once some of these impacts are known, persisting in this behaviour amounts to recklessness, and warrants compensation being made to victims, insofar as the victims are identifiable. Here the authors have been paraphrasing the argument of the White Paper (26-27).

But when we all turn to the question of the form that such compensation should take, the issue is complicated by the need for development away from poverty in developing countries to satisfy the hitherto unsatisfied needs of large parts of their populations. One of the key requirements of such development is an enhanced electricity supply, making it possible, for example, for people to heat their homes, and to write, read and work after nightfall. Thus development involves generating increased amounts of electricity. There are other needs, both for the sake of development and for the sake of adaptation, such as improvements to infrastructure; but let us all (authors and readers alike) focus for the present on the electricity problem.

Now if this increase were to be fuelled by traditional forms of electricity generation, using coal, gas, oil or firewood, then the problems of carbon emissions and of global warming would be exacerbated, and humanity's carbon budget would be exhausted all the sooner. While the increased generation of electricity is needed, this must be generated through alternative forms of energy generation, such as renewables, for carbon emissions must soon be halted altogether, rather than increased. Thus developing countries, like developed ones, must replace carbon-based electricity generation with generation from sources such as solar, wind, tidal, wave and hydro-electric ones; this transition is needed both from the perspective of development and

from that of curtailing global warming and of sustainability, as Henry Shue has argued (11). Besides the requirements of development, both mitigation and adaptation call for this policy shift, for without it mitigation is likely to be undermined, while one aspect of adaptation involves selecting technology suited to a world modified already by climate change, and making it possible to satisfy human needs in these new circumstances.

This transition across forms of electricity generation is one of the areas where developed countries can play their part. For such a transition will depend both on funding and on the availability of appropriate technology. The nature of the technology will vary from place to place; thus hydro-electric power may well work in countries as well-watered as Nepal, but would not be appropriate in most parts of Mali, where solar energy may well work better. However, it is developed countries that have the skills and the resources to investigate which kinds of renewable energy-generation are most appropriate to a given location, that have the ability to transmit suitable technologies and train local staff to operate them, and that have the funds necessary to build and install such operations. Technology transfer, then, is likely to be one form that the compensation that developed countries are morally obliged to offer can take, and financial facilitation is another.

Adaptation, of course, can take other forms, some of them either equally important or nearly so. Flood defences, for example, are widely needed to limit the impacts of floods, and such measures have particular relevance to countries such as Bangladesh, towards half of which is sometimes flooded. The construction of sea- and river-walls could make a large difference in a delta where the banks of distributaries often collapse, causing death and destruction, and so could the construction of roads on embankments clear of flood-levels, and of emergency housing available for people who have to abandon their homes because of flood-waters. Developed countries are able to afford flood-defences such as the Thames barrier in London, and compensation to developing countries could take the form of assisting with adaptation to flooding, which is one of the clearest impacts of climate change.

To select another example, storms and hurricanes cause far more damage in developing countries than in wealthier ones because most buildings there are not constructed to withstand them, but are prone to collapse in strong winds. Developed countries could assist by supplying expertise in architecture and building construction so that new buildings are increasingly hurricane resistant, and so that in some cases older buildings are retrofitted to strengthen their resistance to the stronger winds the frequency of which has become all too predictable. This is another form that compensation could appropriately take.

The introduction of new warning systems and the requisite infrastructure can also be included here. For example, the United States and, beginning in 2018, Japan, have

fleets of so-called 'hurricane hunter' aircraft which allow the respective national weather services to develop and refine forecasts; while that information is shared with other affected countries in a given region, their range is limited. If more equipment and personnel were available in more areas, this could allow for increased coverage and warning time. This would also yield more scientific data about such storms, potentially improving our ability to predict and mitigate such storms in future, regardless of where in the world they are. Improving or introducing new social media based warning systems (while improving or introducing Wi-Fi, such as the balloons being used in Puerto Rico as of the time of writing) can and should also be part of this; in 2011 and again in 2016 the UN declared internet access a human right (11), which reinforces the argument that those with the means to do so are ethically bound to protect that right for those who do not, whether temporarily or in the long term. In those countries where distrust of the government is rife, such a system might need to be operated from outside, either by a transnational coalition, a nearby or allied government or possibly a private corporation.

Another type of compensation might consist in funding to assist with the resettlement of environmental refugees, whether internal refugees or ones who have crossed boundaries from regions that have, for example, newly been struck by climate-related drought.

A further example of adaptation is the building of better infrastructure, including roads and, in some places, railways, as well as a form of infrastructure that has been mentioned, electricity grids. This is also an aspect of development, since at present the needs of many people cannot be satisfied through lack of transportation, or through the lack of a reliable power-supply. Countries such as the Democratic Republic of Congo suffer from very poor transport facilities, with internal communications often limited to travel by air and by boat. While the comparative absence of roads has served to preserve some areas of forest and forest species, human needs could be better served if at least large centres of population were linked to one another by road. Once again, compensation could take the form of facilitating the planning and construction of an enhanced road system, and this could be of benefit within and for many other developing countries as well.

There might well be practical problems about initiating such measures. For example, it would often be unclear which developed country or countries should take the initiative in compensating a particular developing country. It could be held that the former colonial power (in the case of Congo, Belgium, and in the case of Bangladesh, Britain) should take the lead; but that might mean that developed countries with few former colonies, such as Germany, Italy and the United States, or with none, such as Canada, would not play their part. What is needed are coalitions of developed countries, clustered around existing expertise, and capable of jointly shouldering responsibility for particular projects, together with international co-ordination at United Nations level to ensure that no developing country in need of

assistance in matters either of mitigation or adaptation is neglected. The secretariat for such co-ordination could in due course be attached to that concerned with the implementation of the Paris Agreement.

Another danger is clearly that of neo-colonialism, and loss or reductions of autonomy for some of the developing countries receiving compensation. This is a significant risk, especially as adaptation would in some cases be taking place alongside other international developments such as land-grabs, in which wealthier countries (including nowadays China) are buying large tracts of countryside for purposes of agricultural production including the production of biofuels, and achieving this through their economic power and the supposed benefits that it brings to the affected countries. Remedies might include climate compensation being organised by coalitions rather than single countries, and by agreeing an international inspection system empowered to investigate mitigation, adaptation and abuses or power on the part of developed countries and their agencies.

One could also argue for the inclusion and encouragement of private industries to become involved, as they would potentially have the required resources without necessarily being tied to a national government, though this of course would also need strong regulation to ensure that all requirements were being met and that the companies were focused upon impact mitigation rather than being purely profit-driven. A transnational coalition subsidising this could ameliorate such a problem, though stronger restrictions and monitoring may be required.

There would also be the question of impacts of any greener technologies introduced. To return to the example of a hydroelectric dam, while this does create renewable energy, damming a river can have impacts both on-site and beyond. China's Three Gorges Dam, South Korea's Nam River Dam and Egypt's Aswan Dam (12) have both flooded inhabited and culturally significant areas nearby; while inhabitants and cultural artefacts can be moved, whether such treatment of local inhabitants, especially if they are from minority groups, is ethical must be considered. The series of dams on the Mekong in Laos, in addition to flooding areas nearby and creating a similar ethical situation to the above, also will impact fish stocks and river flow downstream in Cambodia and Vietnam. (13) Thus all of these potential problems must be taken into account. Working with these local communities on the best way to preserve their cultures while putting such technologies in place would be necessary, as would the inhabitants' consent being given without coercion, something difficult in totalitarian or military-controlled states (e.g., China, Laos, et cetera). Meticulous environmental impact studies would also need to be done in order to identify and mitigate any environmental changes incurred (e.g., 'fish ladders' or 'fish lifts,' as are used at many dams). All of these remedies would also need to be policed and enforced by an independent authority unconnected to but liaising with the local and/or national governments.

The suggestion should now be considered that compensation could best be attained in a quite different manner, through climate engineering. The best way, it might be suggested, to curtail the need for mitigation and for future adaptation in developing countries and elsewhere is either to reduce solar radiation (Solar Radiation Management) or to sequester carbon dioxide and prevent it becoming active as a greenhouse gas (Carbon Dioxide Reduction). Much discussion has recently taken place about these possible policies (14). But when their varieties are examined, their contribution turns out to be (in some cases) benign but insufficient (as with the possibility of massive tree-planting as a form of Carbon Dioxide Reduction) or (in other, more drastic cases) beset with dangers of adverse side effects and probably irreversible. These latter verdicts apply both to the idea of seeding the oceans with iron to promote the growth of algae to remove carbon dioxide by photosynthesis and to that of managing solar radiation by emitting sulphur aerosols into the stratosphere. Quite apart from side effects of a chemical nature, turning the oceans green is a powerful objection in the first case, and risking the sky ceasing to be blue, as opposed to milky grey, is a formidable objection to the second. There would also be impacts on the creatures of the sea in the first case, and in the second risks of the sulphur aerosols affecting the atmosphere, its clouds and its precipitation. But the prospect of these side-effects is enough to show that neither of these robust forms of climate engineering would be likely to benefit developing countries any more than the others.

Massive tree planting, by contrast, could benefit the countries in which it is carried out, as well as the global climate, and should be considered among policies of adaptation. If one or more developed countries sponsored this, it could also be regarded as a form of compensation, particularly where developing countries have cut down their trees to pay their international debts. Susan George has shown how it has been the most indebted countries that have undergone the most substantial deforestation (15); and in these countries, in particular, opportunities exist for climate change compensation to assume the form of re-forestation, a project that certain countries, such as Ethiopia and Haiti, have decided to embark upon for the sake of their own development. While tree-planting is unlikely to be sufficient to forestall climate change of itself, it could make a helpful contribution that would also assist both development, nature conservation, adaptation and, if done with the assistance of developed countries, compensation at the same time. Otherwise, however, climate engineering should be set aside, in favour of more direct and less risky forms of adaptation and compensation; for compensation that imposes risks on the countries being compensated is barely a bonus, and is in danger of appearing to be itself an example of reckless disregard for their interests.

Conclusions

The authors have argued that countries that have maintained their prosperity through emissions of greenhouse gases in the period when their impacts have been

understood ought to compensate developing countries that are suffering from such impacts. Inter-state compensation has at times been designated 'reparations', and has been exacted from states through peace agreements. The circumstances of climate change compensation are different, and the Paris Agreement does not require it; yet, in spite of this, the moral case for compensation remains a clear one. Developed countries are, the authors maintain, obliged to act as if that agreement had demanded them to compensate the countries that have been subjected to flooding of coastlines and to extreme weather events of increasing frequency and intensity, without having sufficient resources to adapt to these new and challenging conditions. Such compensation, the authors have suggested, could take the forms of technology transfer and related assistance, particularly in the fields of renewable energy generation, infrastructure renewal and forms of adaptation that foster resilience against floods, hurricanes and other extreme weather events.

Since the impacts of such anthropogenic climate change as has already taken place are irreversible, it is important for all countries to adapt to them, and nearly as important for this to be done as to limit or mitigate further climate change and the impacts that it would have. Assistance for projects of adaptation in developing countries on the part of developed countries should not be regarded as a policy of voluntary benevolence, but as the discharge of a moral obligation. There is also a moral obligation on the part of developed countries to concert such assistance, to avert the danger that some developing countries may be neglected or omitted when assistance in the cause of adaptation is being planned.

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