Henry Odera Oruka, Ecophilosophy and Climate Change

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Abstract

The purpose of this paper is to explore what Henry Odera Oruka, a renowned ecophilosopher and Director designate of an Ecophilosophy Centre, would have thought and argued in the sphere of climate change if he had remained alive beyond 1995 and up to the present time.

The methodology of the paper combines an analytic and normative study of ethical issues concerning climate change that arose during the 1990s or have arisen during the subsequent period, with a critical examination of relevant international conferences of the period 1995 to 2012, and of intervening developments, together with inferences grounded in Odera's knowledge, experience and interests to conclusions about attitudes, arguments and stances that he would have been likely to form in the course of that same period.

The central argument of the paper is premised on key concerns of Odera, not least his concern for a "future beyond poverty" for Africa (the title of the World Futures Studies Federation Conference that he organised in Nairobi in 1995), and for characteristic African values. It is also premised on the impression likely to have been made on Odera by the remarks of Michel van Hulten at this Conference. It argues accordingly that Odera would have been likely to defend some version of the Contraction and Convergence strategy, modified to take account of recent discoveries about humanity's carbon budget, and the extent to which much of this budget has already been consumed in the period since 1990 by the industrialised countries, to the detriment of developing countries such as the countries of Africa.

This paper is relevant to *Thought and Practice* through presenting to scholars with broad interests in the humanities and social sciences an original examination of climate change ethics and its bearing on Africa, and of Odera's likely attitudes, arguments and stances in this field, thus supplying suggestions about further research needing to be undertaken on these intellectual, social and political issues, with their special and vital importance for contemporary Africa.

Key Words

Henry Odera Oruka, ecophilosophy, climate change ethics, impacts of climate change on Africa, Contraction and Convergence, humanity's carbon budget.

Introduction

Henry Odera Oruka was a good friend and colleague of mine from the time that I taught Philosophy alongside him at the University of Nairobi in the Spring and Summer of 1975. Subsequently we both took a strong interest in environmental philosophy, and it was in that connection that he invited me back to Nairobi to address the World Conference of Philosophy, which he organised in 1991, and the World Futures Studies Federation Conference on "Futures Beyond Poverty", which he co-ordinated in 1995. On both occasions, as soon as his overseas visitors arrived, he telephoned them in their hotel with words of welcome, to make sure that they had no problems. Accordingly I remember him with both great admiration and great affection.

By 1995 Odera was Director designate of an Ecophilosophy Centre based in Nairobi, but funded from Europe. We may accordingly reflect on some of the areas of research that he would have conducted in that capacity if he had lived on beyond that year, and what he might well have concluded about them. This paper has the underlying aim of discovering where such research would have taken him up to the present time, as an empiricist environmental philosopher with internet access, situated in the heart of Africa.

One of the fields of environmental philosophy which he would almost certainly be addressing is that of climate change and climate ethics. Evidence that he would have pursued investigations in this field is to be found not only in the droughts and floods that he would have observed affecting different parts of Africa in recent years, and which could reasonably be attributed to climate change, but also in some of the remarks of Michel van Hulten, made in front of Odera at the "Futures Beyond Poverty" Conference of 1995, and included in the Conference Proceedings Volume of 1997 (van Hulten 1997, 73-88). Van Hulten is given an honoured place in Odera's Introduction to the Conference, now replicated in the Proceedings Volume (Odera

1997, 11-12), and van Hulten's observations on climate change and policies needed to address it are likely to have held special interest in their turn for Odera.

Thus the specific goal of this paper is to explore what Henry Odera Oruka, as a renowned ecophilosopher and Director designate of an Ecophilosophy Centre, and as an informed African observer and commentator on the international scene, would have thought and argued in the sphere of the ethics of climate change if he had remained alive beyond 1995 and up to the present time. Accordingly, the methodology of the paper combines an analytic and normative study of ethical issues concerning climate change that arose during the 1990s or have arisen during the subsequent period, with a critical examination of relevant international conferences of the period 1995 to 2012 and of intervening developments, together with inferences grounded in Odera's knowledge, experience and interests to conclusions about attitudes, arguments and stances that he would have been likely to form or develop in the course of that same period about the ethics of climate change.

The central argument of the paper is that Odera, given his concern for a "future beyond poverty" for Africa, and for characteristic African values, and the impression likely to have been made on him by the remarks of Michel van Hulten at the 1995 Futures Conference, would have been likely to defend some version of the Contraction and Convergence strategy (which is itself explained below), modified to take account of recent discoveries about humanity's carbon budget, and the extent to which much of this budget has already been consumed in the period since 1990 by the industrialised countries, to the detriment of developing countries such as the countries of Africa. Much of humanity's carbon budget had actually been consumed before 1990, but until 1990 it was not widely recognised that this activity was detrimental to humanity, to future generations, to other species and to planetary systems. As will become apparent in the discussion below, 1990 is a significant date, as from that date onwards the detrimental impacts of greenhouse gas emissions were widely recognised, and relevant activities could no longer be claimed to be conducted in ignorance of their planetary impact.

The coming section covers the period from Odera's final year of life to the Kyoto Summit of 1997, under the heading "From Nairobi to Kyoto". There follow sections on the Kyoto agreement itself, on the Rio + 10 Conference held at Johannesburg in

2002, on the proposed system of Contraction and Convergence, on the alternative proposal of Greenhouse Development Rights, on the more drastic possibility of Geo-engineering, and on "Humanity's Carbon Budget", followed by Conclusions about the ecophilosophical research that Odera would have been promoting in the present.

From Nairobi to Kyoto

It is appropriate first to present an extract from van Hulten's 1995 address to the Nairobi Conference:

> If the rest of the industrialised world would copy Japan's production processes, world consumption of energy would be lower by two thirds, but this is still not yet the required lowering of the level to 1/8th, not to speak of 1/24th or 1/48th.
>
> In line with the foregoing is the conclusion of the International (1) Panel on Climate Change, which has calculated that the use of fossil fuels in the world has to diminish with 60-90 percent in order to prevent further growth of the global warming. The same figure for the industrialised world must be 85 to 90 percent because of the unequal distribution of the shares of total emission over the world at present (van Hulten 1997, 85).

This passage implicitly conveys that global warming is largely man-made (anthropogenic), and is causing increasing climatic problems, and that the emissions of greenhouse gases which cause it must be severely curtailed so as to mitigate the level of greenhouse gases in the atmosphere. It also asserts that the industrialised countries that are largely responsible for these emissions must take the lion's share of the necessary cuts in energy consumption, or at least of energy consumption based on carbon sources (as opposed to renewable sources).

As van Hulten would recognise and Odera would have readily agreed, the situation of developing countries is different because of their need to lift their poorer citizens and their other inhabitants (such as migrants and refugees) out of poverty (the theme of the same Conference). Thus these countries, unlike the industrialised ones, needed to increase their generation of energy so as to supply to their peoples the necessary conditions of development. Only when electricity generation was sufficient to satisfy the basic needs of its people would a developing country be in a position to share in efforts to mitigate atmospheric levels of greenhouse gases.

During the final years of Odera's lifetime, a debate took place among the G-70 countries about whether efforts towards greenhouse gas mitigation and adaptation to irreversibly increased levels of these gases in the atmosphere was or was not appropriate and in their interests. OPEC countries were reluctant to grant that this was the case, because mitigation posed a threat to their profits, but the Association of Small Island States (AOSIS), states whose very survival was itself at risk, managed to persuade the majority within the G-70 that such efforts were imperative. It was not only islands such as the Maldives and Vanuatu that were threatened, for all maritime countries (Kenya included) were at risk from rising sea-levels, many were at risk from desertification, and most were threatened by the spread of disease-carrying species to higher altitudes and latitudes, and by the prospect of increasing numbers of environmental refugees. These ongoing problems convinced the larger developing countries such as China, India, Nigeria and Brazil to support the imperiled small islands, together with the majority of developing countries, including most of the countries of Africa (Grubb and Anderson 1995).

Thus by the time that the Conference of the Parties to the UN Convention on Climate Change was held at Berlin early in 1995, the G-70 was strongly in favour as a group of the need for a binding international treaty regulating climate change, as also was the European Union (Grubb and Anderson 1995). Certain other countries were more reluctant, but the prospects for an agreement were increasingly strong by the time of Odera's death late in 1995, and he may well have looked forward to the Kyoto summit (held in 1997) with some degree of confidence. The prospects of reductions of energy consumption on the scale advocated by van Hulten were admittedly a different matter.

Kyoto, 1997

The Kyoto agreement of 1997 involved cuts to greenhouse gas emissions averaging 5.2% across industrialised countries, from the levels pertaining in 1990, effective until 2012. No cuts were included in the agreement for developing countries, but developing countries were involved because developed countries were allowed to contribute towards meeting their targets through programmes to transfer technology and to increase tree-cover and thus reduce greenhouse gas emissions in the Third World (Houghton 2004).

The Kyoto agreement was from the outset open to the criticism that instead of adopting some morally defensible criterion for permissible emissions of greenhouse gases (such as, for example, equal per capita entitlements), it failed to question the historical emission levels of the various industrialised countries, except through requiring that they be reduced on a very modest scale (by just one twentieth of their 1990 levels). The historical basis thus adopted could not be made the model for future agreements, since the 1990 per capita emission levels of developing countries were vastly lower than those of industrialised ones, and could not reasonably be used as an acceptable base, whether for Kyoto-like reductions or even for modest increases. To expect developing countries to rest content with their emission levels of 1990, or even with slight variations on these levels, would have involved a colossal injustice, and would have condemned their peoples to energy poverty in perpetuity.

Another criticism was that the average reduction of 5.2% was little more than a token of what was already known to be needed. This can be seen if we consider van Hulten's remarks, quoted above, and made two years prior to the Kyoto summit. Much larger cuts would be needed if large rises in average temperatures were to be prevented, accompanied by the melting of ice-caps and glaciers, rises of sea-level and widespread disruption of weather systems, affecting all continents (Houghton 2004; Meyer 2005).

Yet if Odera had been able to contemplate this agreement, he would still have found several grounds for believing that progress had been made, offering a tangible basis for hope for the future. One was the mere fact that an agreement was reached at all. This achievement was reached as delegates were already leaving, and was only narrowly attained. But the making of it meant that there was a precedent for an international climate change agreement, and that the Conferences of the Parties that subsequently took place had in common some kind of shared recognition of the problem, and a basic agreement, however unsatisfactory, to improve on. Another ground for satisfaction was the double recognition that developing countries could not be expected to reduce their emissions at that time, but that they could make a difference to the problem through participating in green technology and in efforts at afforestation. Odera had long been an empiricist (Ogutu 1997), and probably remained one throughout his life (albeit with possible qualifications to find room for, say, mathematical knowledge); and his empiricism would have been likely to confirm

him in the sage-like view of the Kyoto agreement that ‘a bird in the hand is worth two in the bush’. Even if he did not regard such folk-wisdom as philosophy, he would have recognised it as sagacity none the less.

Johannesburg, 2002

The process begun at the Rio de Janeiro summit of 1992 (let us call this ‘the Rio process’) was continued at the Rio + 10 Conference, held at Johannesburg in 2002. This Conference was not primarily concerned with climate change, since signatures to ratify the Kyoto agreement were still being gathered. (A crucial threshold was crossed in 2004, when Russia belatedly signed.)

Instead, the focus at Johannesburg was on development (rather than on sustainability), and on the importance of growth in developing countries to alleviate poverty. The fact that this world summit was taking place in Africa, and in the post-apartheid Republic of South Africa, would not have been lost on Odera. The Johannesburg conference could even be regarded as a partial vindication of the hopes expressed and raised at the Nairobi conference on futures beyond poverty that he had co-ordinated seven years earlier in 1995.

Odera would also have been aware of the shortcomings of the Johannesburg gathering. Big business was widely seen as having an undue influence, and the huge inequalities present in South African society supplied a paradoxical contrast to the aspirations of development and of poverty alleviation voiced by the summiteers. Around this time (2000-2), I was researching the implications of sustainable development for South Africa, jointly with Johan Hattingh of Stellenbosch University and with Manamela Matshabaphala of the University of Witwatersrand, with an emphasis on sustainable livelihoods and on the implications of the new constitution for land reform (Attfield and Hattingh 2002; Attfield, Hattingh and Matshabaphala 2004). Odera would have been likely to welcome these applications of philosophy to the introduction of sustainability to Africa.

What is more, Odera would have applauded the raising of the profile at the Johannesburg Conference of issues concerning the international distribution of resources, and concerning the need for investment and technology transfer to continents such as Africa. South Africa was then and continues still to be a rising star

on the international scene. Besides, the importance of research on tropical agriculture and tropical medicine (itself till then the Cinderella of the world of research) received new emphasis; and all this he would have welcomed in the cause of moving towards a future without poverty. Yet he would also have regretted (if that is not too weak an expression) the absence of progress on regulating climate change, or of progress towards an international regime that took it seriously.

Contraction and Convergence

By the stage of the Johannesburg Conference of 2002, Odera would also have been aware of the suggested criterion for the distribution of greenhouse gas emission entitlements, namely that every human being alive should have an equal entitlement to every other, and of the related programme for the application of this criterion to the international scene, that of Contraction and Convergence. This idea was conceived in the mid-1990s by the London-based Global Commons Institute (GCI), which had been founded in 1990 by Aubrey Meyer, a musician turned environmental campaigner, whose book *Contraction & Convergence, The Global Solution to Climate Change* was republished in 2005 (Meyer 2005). Contraction and Convergence has won the support of a number of governments, and remains a possible basis for a world agreement on climate change.

Essentially the proposal, based as it is on equal per capita entitlements, is that each country should be credited with entitlements corresponding to the size of its population, as measured at an agreed date. Thus China and India would receive the largest entitlements, and countries such as USA, which currently emits towards a quarter of total greenhouse gas emissions, would receive an entitlement in line with its proportion of the global population, of around 4%. Countries wishing to emit more than their entitlement would be able to purchase emission entitlements from countries whose entitlement was not fully being deployed. This system, then, combines an egalitarian basis (towards which the global system would gradually converge: hence ‘Convergence’) with redistributive tendencies. Another key feature of this system, however, is that the allowable total of emissions would gradually contract (hence ‘Contraction’), so that the average temperature increase above pre-industrial levels would be minimised, and (in recent versions of this scheme) prevented from rising

above 2 degrees Celsius. Even this order of increase is a hazardous one, but much less so than increases of 3, 4 or even 5 degrees.

The central overall impact of Contraction and Convergence would be the mitigation of levels of greenhouse gases in the atmosphere. Countries would, in addition, need to fund their own adaptation to irreversible aspects of climate change, but funding towards the costs of this would become available through the proceeds of the trading of emission entitlements.

One of the dangers of the proposal is that it could encourage population growth, which would make the problem of climate change greater still, and would also exacerbate other global problems, such as the problem of food-supply. A possible solution to this problem would be to agree an early rather than a later date for the censuses that would determine the entitlement of each country, thus removing both the incentive to promote population growth and the incentive to generate bogus census returns appearing to record a greater population than really exists. International verification of such censuses could form another element in this solution.

Another apparent danger is that impoverished countries might trade away their entire emissions allowance, leaving no entitlements to satisfy the basic needs of their people. This might appear a temptation facing heavily indebted countries. The most obvious solution to this problem would be to cancel all unrepayable international debt. But, short of that outcome, another solution, proposed originally by Henry Shue at an Inter-governmental Panel on Climate Change Workshop held at Nairobi in 1994 (Shue 1995), is to agree limits to the tradability of emission entitlements such that entitlements required to satisfy basic needs would not be tradable, and trading would be restricted to the entitlements that exceed these (ones elsewhere designated ‘luxury emissions’ by Shue). Amended in this way, the system appears capable of implementation without disaster, even in the absence of a global cancellation of unrepayable debt. (If Odera was present at this Workshop, he might even have heard Shue’s presentation in the year before he died. If so, it is difficult to imagine him disagreeing with the good sense and the fairness of Shue’s solution.)

There are, however, deeper objections to Contraction and Convergence, one of which can now be mentioned. This approach effectively disregards historical emissions, even when countries have benefited economically from them, and focuses entirely on

current populations and future outcomes. So it can be accused of being unfair, since countries that have not caused the problems are treated on a par with those whose industrialisation contributed both to the problems and to their own current prosperity. Replies that could be made focus on the need to find viable solutions in the present. Rather than delving into the history of emissions from the middle of the eighteenth century onwards (and attempting to divide, for example, the emissions of the former Austro-Hungarian Empire among the many modern states that occupy what were once its territories), what is needed is to devise a workable and sustainable system capable of persisting across the coming decades and of restricting the worst impacts of greenhouse gas emissions, however they were caused. As the example of the Austro-Hungarian Empire illustrates, not all the states that were historically responsible for significant emissions still exist, so as to be able to pay for their share in causing the problems. Besides, there is a difference between causal responsibility and moral responsibility. Emissions of the period prior to 1990 were mostly not known by their agents to be contributing to global warming, but were merely considered to be a way of making use of the environment to produce goods and a livelihood. It is only the emissions of the subsequent period about the agents of which issues of moral responsibility arise.

I will return to these issues at a later point, in connection with humanity's carbon budget. For the present, however, the responses just supplied appear, or at least appeared until recently, to offer a satisfactory rebuttal of the criticism relating to historical emissions, thus allowing the benefits of Contraction and Convergence to appear to outweigh such problems as remain. The implications for African countries, for example, would include receipt of entitlements in excess of current usage, and thus the ability to trade the surplus with industrialised countries wishing to make up for their own reduced entitlements. Revenues thus secured could be used for purposes of adaptation and of social and economic development. Meanwhile the overall system would be likely to reduce the expected rise in sea-levels, the expected increase in freak weather events, the predicted increase in the number of environmental refugees, and the foreseeable loss of species and of wild habitats such as forests, all of which would assist the tourist industry and, more importantly, enormously benefit the people of countries such as Kenya as a whole.

Odera, if able to follow the debate (as perhaps he actually did up to 1995), could well have found himself in favour of Contraction and Convergence as the best available global solution, criticisms notwithstanding. His focus, as a Kenyan and as an African, could well have been on the prevention of droughts and floods, and of the spread of vector-borne diseases such as malaria and dengue-fever, not achievable without Contraction, on equity (a principle upheld by Convergence), and also on the scheme's impact on the preservation of wildlife, partly because of its instrumental value (in the cause of tourism) and partly for the sake of its intrinsic value, as in the values widely characteristic of African thought and practice (Kelbessa 2011; Behrens 2011).

Greenhouse Development Rights

However, in 2007 a group of researchers put forward a different proposal for a global solution, which Odera might have found at least equally attractive, if he, as the Director designate of an Ecophilosophy Centre, had received it out of the blue as an e-mail attachment, as happened to me despite having written only two papers in this field. This was the scheme entitled 'Greenhouse Development Rights', proposed by Paul Baer, Tom Athanasiou and Sivan Kartha (Baer *et. al*. 2007). A revised edition of their text was produced in 2008, with Eric Kemp-Benedict as an additional author (Baer *et. al*. 2008). In this scheme, the problems of poverty and deprivation would be addressed simultaneously with the problem of climate change. All human beings would be credited with a right to development, and everyone living at above a certain threshold would be expected to contribute to a global fund intended to foster development, greenhouse gas mitigation, and adaptation to irreversible climate change. The threshold was tentatively set at the average income of the people of Spain. This would mean that contributions would be expected not only from people in industrialised countries with incomes above the threshold, but also from the rich of developing countries, who would be immune from such contributions within most versions of the Contraction and Convergence framework.

A further shortcoming of Contraction and Convergence which the proponents of Greenhouse Development Rights sought to rectify was the decrease of income for developing countries from trading emission entitlements that might be expected to ensue when, a few years after the inauguration of the scheme, the overall allowable total of emissions became significantly reduced, and thus the value of any remaining

surplus quotas was to be expected to dwindle towards zero. Some of the benefits of Contraction and Convergence for developing countries would thus be short-lived, in contrast to those of Greenhouse Development Rights, which would persist as long as that system continued to operate.

Further benefits for developing countries would be ongoing funding for their development, and thus a greatly enhanced prospect of a future 'beyond poverty', combined with the advantages to be derived from greenhouse gas mitigation and adaptation to irreversible climate change. The suggestion of the authors was that in the absence of funding for development, developing countries could not be expected to participate in any global scheme. This may have been a premature view, given that climate change currently threatens the climate and thus the viability of these countries as well as of developed ones, and thus that any acceptable scheme to counteract these tendencies would be capable of rescuing them from catastrophe. However, the promise of funding for development in addition to these benefits appeared to make Greenhouse Development Rights a superior solution.

Yet this scheme, which has the support of charities such as Christian Aid, appears not to have secured the support of governments, and we should now consider its disadvantages and what obstacles might prevent its acceptance. The suggestion within the scheme for taxation of everyone above the threshold in every country and for the deployment of the proceeds by an international authority is likely to be regarded by many countries (African countries included) as an undermining of their sovereignty. Even if it is a person's country of residence which collects this international tax, there could be objections to the criterion being externally determined. More crucially, objections are likely to such a high degree of delegation of power to an international authority, in the form of the body entrusted with allocating and distributing the relevant revenues for the triple purposes of development, adaptation and mitigation. What guarantees would there be, sceptical governments might ask, of the efficiency, equity and above all of the trustworthiness of this body? To whom would it be answerable, and why should democratically elected governments trust it to wield such large-scale powers on their behalf? What redress would there be in the event of global maladministration at this exalted level?

Some of these objections could be seen as nationalistic special pleading, but to some of them it might reasonably be felt that there is considerable substance. For there are genuine reasons to doubt that the international authority to be established within this scheme would invariably be both trustworthy and efficient perpetually and in principle for ever, and there are genuine dangers in such a concentration of power, however important the purposes of development, adaptation and mitigation might be agreed to be. A touch of tyranny from its head could apparently crush an entire continent. Further, these problems result from the broad scope of the scheme, intended as it is to tackle climate change and development simultaneously. While it can be argued that these themes are closely connected, programmes that addressed them separately could well be more widely acceptable. Odera would have been conscious of the large advantages for African countries of Greenhouse Development Rights, but would perhaps still not have withdrawn support for Contraction and Convergence. To place one's full trust in a so all-encompassing a scheme would involve the heavy risk that, in the likely event of its non-acceptance or non-implementation, all the rapidly accelerating problems of climate change would continue and accumulate unabated.

Geo-Engineering

Despite such admirable proposals as those described above, world governments have failed to reach an agreement on climate change. For many years this was largely attributable to the policies of the American President, George W. Bush and of the American Congress. Yet not even the election of Barack Obama to the Presidency in 2008 sufficed to break the log-jam. High hopes were invested in the Copenhagen Summit of 2009, but nothing was achieved beyond the continuation of the Kyoto agreement, and even that applied only to willing parties such as the European Union. The Cancun Summit of 2010 fared little better, apart from preparing for the Durban Summit of 2011 (Gardiner 2011). In view of this long-lasting deadlock, proposals of a new and different kind began to receive support. These were proposals to modify the planet in ways intended either to avert or to reduce the problem. These proposals have been given the name 'Geo-Engineering'.

There are two main kinds of geo-engineering, one intended to reflect solar radiation back and away from the Earth (Solar Radiation Management), and the other intended

to reduce atmospheric levels of carbon dioxide (Carbon Dioxide Removal) (Gardiner 2011). Let us consider Carbon Dioxide Removal (CDR) first.

Some varieties of CDR overlap with strategies either of mitigation or of adaptation. Thus one form is large-scale afforestation, designed to sequestrate carbon dioxide for the lifetime of the newly planted trees, and then to replace them with others. Such methods, however, are unlikely to be conducted on a sufficient scale to form a solution without being supplemented. Another strategy is to sequestrate carbon in the oceans through the introduction there of iron filings to seed the growth of algae; but the impacts of this measure, both ecological and aesthetic, suggest that, short of near catastrophe, and in view of the risks to ocean eco-systems, it should be firmly rejected. The thought of the waters of the Indian Ocean turning bright green would probably have been sufficient to assure Odera that measures of this kind were to be disowned.

The other apparently viable proposed strategy (widely praised but not yet operative) is that of Carbon Capture and Storage (CCS). If CCS could be rapidly and successfully introduced at all or most coal- oil- and gas-powered generating facilities, electricity could be harmlessly generated from fossil fuels without the foreseeable bad effects in the form of carbon emissions which currently attend the operation of such power stations. Apologists of conventional energy generation are prone to point to this possibility as if it was poised to render this activity unproblematic. Unfortunately the technology required for successful CCS does not yet exist, and problems have to be overcome such as discovering safe methods of leak-free underground storage; for if the buried carbon were to simply leak back into the atmosphere, humanity would be worse off than if no reliance had been placed on CCS in the first place. Odera would have both accepted the advantages of the widespread adoption of CCS once properly researched and secured from problems such as those just mentioned, and have recognised that reliance could not currently be placed on this technology to solve the intensifying problem of accumulating carbon dioxide concentrations in the atmosphere.

CDR, then, can generally be regarded as promising but having a long lead-time. If we had decades to solve the problem of global warming, CDR might form a key component of that solution. But in actual fact, as Odera would recognise if he were

alive and observing the current scene, the problem is so urgent that we may well be unable to wait that long, unless, of course, the countries of the world quickly reach a viable agreement on mitigation and related issues of verification and burden-sharing, alongside which techniques of CDR could be phased in without disaster, if the technical problems just mentioned about CCS could be overcome.

This helps explain the enthusiasm in some quarters for the other form of geo-engineering, Solar Radiation Management (SRM). One form of SRM would involve placing some thousand reflective discs in the stratosphere, to reflect back some of the incoming solar energy; but this form, quite apart from its side-effects, would cost trillions of dollars to implement, and is thus a non-starter. Another SRM option would involve the release over a considerable period of time of large quantities of sulphate aerosols into the stratosphere. This option can be made to sound acceptable when proposed as a supplement to powerful strategies of mitigation. But in the absence of such strategies, it would have to be continued indefinitely; and this makes it all the more important to consider its side-effects.

One side-effect is that the sky would cease to be blue. While this might seem to be merely an aesthetic problem, this change could turn out to strike at the heart of the living processes that have sustained Earth's species over the millennia. Maybe if blue skies were replaced by milky greyness, the incentive to persevere, in particular, with many of humanity's greatest projects would be attenuated or even undermined. Odera would have probably been appalled at the very thought of the characteristic skies of Africa no longer being seen. Another side-effect might be pollution. If the aerosols of the stratosphere came to affect the clouds of the atmosphere, precipitation could soon assume the form of dilute sulphuric acid, with disastrous effects for crops, coral reefs, animals and people. Other foreseeable effects include changes to rainfall patterns, involving risks to seasonal rains even greater than those experienced in recent years. Ways of life grounded in regular seasonal rains would be at risk, something that Odera would have been unlikely to welcome.

Another problem is that of reversibility. Imagine that this form of SRM has been introduced, but no agreement proved attainable about mitigation, and atmospheric warming continued apace. Our successors might then have to decide whether to continue casting sulphate aerosols into the sky or not. But to halt the SRM strategy

would be likely to mean a large sudden increase in atmospheric warming, due to an increase of solar radiation reaching the surface of the planet. Thus continuation might be the only option, together with an exacerbation of whatever the side effects might prove by then to be. Like most impartial observers, Odera would almost certainly be unwilling to take the risk of inaugurating a process that could bring us to such a dilemma.

Why, then, is this form of geo-engineering so popular in some circles? As Stephen Gardiner explains, it is relatively cheap, can be quickly implemented, and would have significant effects on the global climate once deployed (Gardiner 2011, 179). Besides, its implementation need not depend on reaching a global agreement first, or even on making provision for adaptation in countries suffering the effects of global warming. In other words, it comprises a technological fix, full of risks (such as to the Indian monsoon (Gardiner 2011, 179)), but it is apparently capable of solving some of the more troubling aspects of climate change without making concessions to international equity and without significant sacrifices being involved for Western economies, unlike all envisageable varieties of mitigation strategies.

The sulphate aerosol method of SRM was originally proposed as a supplement to climate change mitigation, but there is a danger (in the light of the above) of it becoming regarded as a substitute. This is the core of the 'moral hazard' argument (Gardiner 2011, 166-7), and refers to the danger that people with this form of SRM as an insurance against the worst impacts of climate change may take greater risks, and thus reduce the effort expended towards strategies of mitigation and adaptation. A recent report of the Royal Society raises doubts about whether this danger will be realised, arguing that a contrary effect (of increased effort) is possible instead, and maintaining that in the absence of empirical evidence this argument should be disregarded or at least de-emphasised (Shepherd *et. al*. 2009). However, Gardiner supplies grounds for taking the moral hazard argument more seriously than this, albeit as not decisive in isolation. Indeed, when this argument is combined with the evidence of climatic risks and the unavailability of an acceptable exit strategy, the case against it seems overwhelming, as Odera would doubtless agree.

The Royal Society report advocates research into the less risky kinds of geo-engineering, neither on a basis of cost-effectiveness, nor on a basis of last resort, but

in the name of buying time, or making up for lost time. The moratorium that they recommend on field trials of sulphate aerosol SRM and also of iron-filings CDR appears well-justified. Research on the remaining, less risky kinds seems appropriate as well, particularly on the remaining kinds of CDR. Even if this would fail to buy time, it would diminish the severity of the problem. But, as Odera would have agreed, none of this should be allowed to attenuate efforts (whether scientific, technological or political) to reach an agreement on mitigation and adaptation, or to divert attention away from those vital efforts.

Humanity's Carbon Budget

As Odera would probably have recognised if, having quite possibly heard Henry Shue's Nairobi presentation of 1994, he had encountered Henry Shue's even more striking presentation made at Oxford in 2011, the ethical situation is considerably changed by Shue's reflections on humanity's carbon budget. Granted the all-important goal of limiting carbon dioxide levels to 2° (Celsius) above pre-industrial levels, scientific research now discloses that, for a 50% chance of achieving this goal, humanity must limit itself to emitting (in the period from 1750, the dawn of the industrial revolution, into the present and the future) just one trillion tonnes of carbon, an amount which Shue call's 'humanity's carbon budget' (Meinhausen *et. al*. 2009; Shue 2011). 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 (Department of Physics, Oxford University *et. al*. 2011). Hence, carbon emissions need to be drastically curtailed; indeed for a 75% chance of avoiding a 2° temperature rise, the permissible total from 1750 would have to be limited to 750 billion tonnes. However, most of the emissions of the past have been generated by USA, Europe and other developed countries, whose development is largely due to these very emissions. So it would be irresponsible if these countries, having used up more than half of the maximum allowable total, were to suggest that the historical record be ignored and that equal emission quotas be allocated to everyone, their own peoples included, as if the past had not happened and we were all free to devise a system from scratch.

Shue recognises that, as well as curtailing carbon emissions, humanity needs to make it possible for developing nations to move away from poverty, and thus, so as to

satisfy the basic needs of their citizens, to generate increased amounts of electricity. But these increased amounts must be generated through renewable forms of energy generation, for carbon emissions must be halted altogether. 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. Hence transferring to those countries suitable technology (or 'technology transfer') is even more crucial than it has appeared in the past (Shue 2011).

Now it does not immediately follow from the facts of history and the extent of humanity's carbon budget that emission entitlements should not be equal, and that Contraction and Convergence thus becomes an inappropriate proposal. For Contraction remains vital, and even the citizens and residents of developed countries will still have needs of their own to be satisfied, despite the large emissions of their predecessors. Besides, as has been remarked above, until around 1990 the current near-consensus about climate change being anthropogenic did not exist, and so attributing responsibility for emissions prior to that date could be held to be unfair, since the impacts of emitting carbon were then neither known nor foreseeable. However, the same countries have continued to emit large quantities of carbon dioxide since 1990, and for these emissions they can more obviously be held responsible. The emissions of this twenty-year period are likely to amount to over one tenth of the 55% of humanity's carbon budget already consumed across the last 200 years (Shue 2011), and cannot fairly be disregarded.

Besides, countries that are technologically capable of making the transition to renewable energy generation should clearly take the lead in doing so, and these are largely the same countries as those that owe their development to emissions of the past. By contrast, developing countries such as India, China, Brazil, South Africa and Kenya often lack the capacity to make this transition quickly, but are still obliged to generate increased quantities of electricity to meet the unsatisfied needs of many of their citizens and residents. And this suggests that emissions entitlements should temporarily be weighted in favour of residents of developing countries, rather than being equal, and that the entitlements of developed countries, which are the ones that have either been emitting carbon dioxide in large quantities since the Industrial Revolution, or have at any rate been doing so since 1990, should be lower (per capita) than those of developing countries. This would be fair and equitable, as Odera would

be likely to agree, because, if emissions entitlements across time for the period from 1990 to (say) 2050 were made equal (a defensible principle of equality), developed countries turn out to have used up far more of their entitlements than the others already, and so their entitlements could reasonably be made less than equal for the coming decades.

What I have said so far relates mainly to what must be the central goal of climate policy, mitigation. Without mitigation, both future generations and most non-human species seem to be condemned to suffer the accumulated and increasing impacts of climate change. But mitigation alone is not enough, especially in developing countries, which are often the countries most vulnerable to climate change in the present, and have often contributed very little if at all to the activities that have caused it. Thus countries like Bangladesh are particularly vulnerable both to floods and to droughts, and at the same time lack the capacity to put in place adequate flood defences or to take steps to guarantee their water-supply, especially when other states impound the waters of their main rivers upstream for the sake of their own development.

In saying this, I am trying to illustrate the need for adaptation to the impacts of climate change, including rising sea-levels, as well as to the other problems mentioned earlier. Countries like Britain are able to afford their own flood-defences, but many developing countries (Bangladesh among them) need international assistance to achieve what is required. To give a further example, assistance for the construction of flood-defences in the Maldives and in Tuvalu could secure parts of those countries from inundation by the oceans, like the sea-defences that the Dutch have long since managed to install for their own territory, as would not have escaped Odera when he was visiting the Netherlands to raise funds for the 1995 Conference. Accordingly any satisfactory international agreement on climate change, as he would almost certainly have agreed, would have to make provision for adequate international funding for such purposes. Some steps towards such provision were taken at the conferences at Copenhagen (2010) and Durban (2011), but they need to be strengthened, and the details of their funding to be agreed.

Simon Caney distinguishes in such connections between compensation for harms resulting from past emissions, and adaptation, the point of which is to prevent future

climate-related harms, regarding both of these harms as infringements of human rights (Caney 2010). This is a useful distinction, as the case for compensation underlines the responsibilities of the developed countries that have caused the problems, and have continued causing them despite knowing they were doing so since at least 1990. Odera, who believed in compensation for historical wrongs, might well have wanted to explore and research this distinction further. Yet it is in practice difficult to distinguish compensation and adaptation, since the same infrastructural measures are required to prevent recurrences of, say, flooding and to prevent future flooding, even if compensation to the victims of past emissions would involve further measures, such as the resettlement of environmental refugees. To set up separate agencies for these two distinct purposes would probably be counter-productive, particularly when the need for action is as urgent as it is. However, the international funding of adaptation should reflect the case for compensation as well as the case to assist struggling countries to adapt. Thus it would be unethical for the funding of all the relevant measures to be based on loans from developed countries rather than grants, particularly as these same countries have caused the problems to be countered.

Accordingly, if a global system such as Contraction and Convergence were on the international agenda, a version of this system should be considered with significant adjustments made so as to take into account the way in which developed countries have already used up since 1990 a considerable proportion of what would be their fair share of permissible emissions of the six decades from that date. This kind of approach goes a long way towards satisfying van Hulten's remarks of 1995 (van Hulten 1997, 73-88), and it is difficult to envisage Odera dissenting.

Conclusion

As the eventual Director of an Ecophilosophy Centre, Odera would probably have followed many environmental issues, and not only that of climate change. For example, he would probably have followed the development of the Biodiversity Convention, signed at Rio in 1992, and its embodiment in the agreement reached at the Nagoya Conference of 2010. In all probability he would have been encouraged by this agreement about biodiversity preservation, and might well have embarked on research about its application to Kenya, and in particular its bearing on the country's biodiversity hotspots such as Amboseli and Masai Mara, and to the possibilities for

international funding for the actions and policies that would emerge as necessary for such preservation.

Nevertheless, Odera would also almost certainly have followed issues concerning the science, the politics and the ethics of climate change, including the ethical issues presented above. Themes that he would have been likely to consider include whether, as the Polluter Pays Principle maintains, it is all and only those causally responsible for pollution who should pay for what is needed to rectify the harms that it causes, or whether international agreements should focus rather on moral responsibility, and the related issue of what difference the facts about past emissions make to responsibilities in the present. He would probably have wanted to conduct research into finding sustainable solutions to issues of climate change, capable of being adopted and implemented for decades to come. He would also have been likely to study ethical aspects of issues directly affecting Africa, such as the increased numbers of environmental refugees, the loss of habitats and the geographical spread of vector-borne diseases, all probably resulting from climate change, and would have been all the more eager to identify remedies to the causes of these problems.

In addition, Odera would probably have studied, with some measure of approval, schemes for global remedies for climate change, such as Contraction and Convergence, and the modified version of such schemes presented above. He might well have been attracted by the scheme of Greenhouse Development Rights, but would also have taken into account the political problems that detract from its viability. He would probably have rejected the more radical kinds of geo-engineering, while being sympathetic to the large-scale planting of trees. He would also have probably been encouraged by the agreement at the Durban Summit of 2011 to negotiate a global climate change treaty, and would have been eager to foster proposals about the content of such a treaty, arguably along the lines suggested in this paper, which go a long way towards compliance with van Hulten's remarks made at Nairobi in 1995, but possibly on different lines that he would have regarded as improving on them. As he would also have recognised, there is, in any case, a pressing need for his living successors to continue researching the study of these matters, given his own unavailability to do so.

Note

When van Hulten wrote of the 'International Panel on Climate Change', he would have been referring to the Intergovernmental Panel on Climate Change, reports from which were issued from the early 1990s. The Fifth Assessment Report of IPCC is due to be published in 2014.

References

Attfield, Robin and Johan Hattingh. 2002. "Ecological Sustainability in a Developing Country such as South Africa? A Philosophical and Ethical Inquiry". *The International Journal of Human Rights*, Vol.6 No.2, pp.65-92.

Attfield, Robin, Johan Hattingh and Manamela Matshabaphala. 2004. "Sustainable Development, Sustainable Livelihoods and Land Reform in South Africa: A Conceptual and Ethical Inquiry". *Third World Quarterly*, Vol.25 No.2, pp.405-21.

Baer, Paul, Tom Athanasiou and Sivan Kartha. 2007. *The Right to Development in a Climate Constrained World: The Greenhouse Development Rights Framework*. EcoEquity. www.ecoequity.org/docs/TheGDRsFramework.pdf , accessed 31 December 2007.

Baer, Paul, Tom Athanasiou, Sivan Kartha and Eric Kemp-Benedict. 2008. *The Greenhouse Development Rights Framework: The Right to Development in a Climate Constrained World*, 2nd Ed. www.ecoequity.org/docs/TheGDRsFramework.pdf , accessed 10 September 2012.

Behrens, K. 2011. "African Philosophy, Thought and Practice, and Their Contribution to Environmental Ethics". Unpublished Ph.D. thesis at the University of Johannesburg.

Caney, Simon. 2010. "Climate Change, Human Rights and Moral Thresholds". In Gardiner, Stephen et al. eds. 2010, pp.163-177.

Department of Physics, Oxford University and Smith School of Enterprise and the Environment, Oxford University, 2011. http://trillionthtonne.org , accessed 10 September 2012.

Gardiner, Stephen M., Simon Caney, Dale Jamieson and Henry Shue, eds. 2010. *Climate Ethics: Essential Readings*. Oxford: Oxford University Press.

Gardiner, Stephen M., 2011. "Some Early Ethics of Engineering the Climate". *Environmental Values*, Vol.20 No.2, pp.163-188.

Grubb, Michael and Dean Anderson. 1995. *The Emerging International Regime for Climate Change: Structures and Options After Berlin*. London: The Royal Institute of International Affairs Energy and Environmental Programme.

Houghton, John. 2004. *Global Warming: The Complete Briefing*, Third Edition. Cambridge: Cambridge University Press.

Kelbessa, Workineh. 2011. Indigenous and Modern Environmental Ethics: A Study of the Indigenous Oromo Environmental Ethics and Modern Issues of Environment and Development. Washington, DC: Council for Research in Values and Philosophy.

Meinhausen, Malte, *et. al*. 2009. "Greenhouse Gas Emission Targets for Limiting Global Warming to 2° C". *Nature*, Vol.458, 30th April 2009, pp.1158-1163.

Meyer, Aubrey. 2005. *Contraction & Convergence: The Global Solution to Climate Change*. Schumacher Briefing no. 5. Totnes, Devon: Green Books.

Odera Oruka, Henry. 1997. "Opening Speech for the WFSF (sc. World Futures Studies Federation) XIV World Conference" (1995). In Ogutu, Gilbert et al. eds. 1997, pp.11-12.

Ogutu, G.E.M. 1997. "Weep Not … Philosophers Never Die", in Ogutu, Gilbert et al. eds. 1997, pp.ix-xi.

Ogutu, Gilbert, Pentti Malaska and Johanna Kojola eds. 1997. *Futures Beyond Poverty: Ways and Means Out of the Current Stalemate*. Turku: Finland Futures Research Centre.

Shepherd, John, et. al. 2009. Geoengineering the Climate: Science, Governance and Uncertainty. London: Royal Society.

Shue, Henry. 1995. "Equity in an International Agreement on Climate Change". *Proceedings of IPCC* (sc. Inter-governmental Panel on Climate Change) *Workshop, Nairobi, 1994*. Nairobi: ICIPE Science Press, pp.385-92.

--. 2011. "Climate Hope: Fair Shares in the Exit Strategy". Unpublished paper, presented to the Conference on 'Justice and Climate Change' of the Centre for the Study of Social Justice, Department of Politics and International Relations, University of Oxford, 9 – 10 September 2011.

Van Hulten, Michel. 1997. "Futures Beyond Poverty". In Ogutu, Gilbert *et. al*. eds. pp.73-88.