Climate Change and Political Philosophy: Who Owes What to Whom?

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ABSTRACT

Climate change poses a serious problem for established ethical theories. There is no dearth of literature on the subject of climate ethics that break down the complexity of the issue, thereby enabling one to arrive at partial conclusions such as: 'historical justice demands us to do this…' or 'intergenerational justice demands us to do that…'. In contrast, this article attempts to face up to this complexity, that is: to end with a synthesis of the arguments into what can be considered to be the most reasonable and fairest approach to the politics of climate change on a global scale. A significant part of the paper is devoted to the questions whether or not a) historical emissions and b) population changes are relevant to how emissions rights should be distributed. I discuss the merits and drawbacks of each perspective and briefly outline the normative justifications.

KEYWORDS

Climate change; climate ethics; political theory; distributive justice; international justice; intergenerational justice; historical justice; population growth

INTRODUCTION – WHAT IS FAIR WHEN IT COMES TO CLIMATE ISSUES?

On 19 December 2010, the last day of the global climate conference in Copenhagen, several countries with high greenhouse gas emission levels proposed a painstakingly negotiated compromise paper to the plenary assembly. The chief negotiator of the developing countries, the Sudanese Lumumba di-Aping, called this 'a solution based on values that funneled six million

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people in Europe into furnaces'.[1] This comparison to the Holocaust caused a worldwide sensation. One cannot reach more deeply into the console of moral arguments. But is such a comparison justified?

This is a question neither for empirical political science, nor for economics, nor for natural science but for the new and developing field of 'climate ethics'. Within this field, moral philosophy discusses how an individual person should act with regard to climate change. Political philosophy debates distributional regimes for greenhouse gas emissions and who owes what to whom.

Gardiner calls the ethics of climate change 'a perfect moral storm' (Gardiner, 2006), emphasising the especially intricate nature of the problem of climate change for political philosophy, a Pandora's Box involving questions of pure distributive justice, international justice, historical justice, intergenerational justice and compensatory justice. There is no dearth of literature on climate ethics breaking down the complexity of the issue, thereby enabling one to arrive at partial conclusions such as: 'historical justice demands we do this…' or 'intergenerational justice demands we do that…'. This article, in contrast, attempts to face up to this complexity, that is: to end with a synthesis of the arguments into what can be considered to be the most reasonable and fairest approach to the politics of climate change on a global scale.

However, before addressing the question of justice at all, we must first establish the object of contention.

2. JUSTICE WITH REGARD TO WHAT?

It has convincingly been argued that we should regard the climate system as a 'global common' (Barry 2005, 266-268; Page 2006, 61). The atmosphere is possessed by no particular people, groups or countries. As such, every human being is entitled to use of the atmosphere. In other words, each person has the right to emit greenhouse gases (carbon dioxide equivalents = CO_2^e) into the atmosphere. The capacity of the atmosphere to absorb these substances, however, is limited. The demand for atmospheric resources exceeds the supply. From a moral point of view, it makes no difference whether the commodity in question is a resource or a sink. Principles of distributive justice among individuals can be applied just as well to emission distribution rights as to the sharing of other scarce goods (food, water, living space). So, prima facie the good to be distributed is the capacity of the atmosphere to absorb greenhouse gases.

On an axiological level, one could imagine debates about the distribution of alternative goods, for example a) the wellbeing produced by greenhouse gas emissions or b) the economic growth they generate. The former is at the

1. http://www.guardian.co.uk/environment/2009/dec/19/copenhagen-reaction-delegates-speak. Last accessed 9 September 2013.

very least atypical terminology. If we are talking about the just distribution of a load of rice in a refugee camp, then on an axiological level, we normally regard the rice as the distribution object, not the changes in wellbeing it brings about for its recipients. We usually calculate in sacks or kilograms, because we cannot know how much personal wellbeing comes from a sack of rice. Of course, we distribute the rice because we are concerned about the wellbeing (or even survival) of the refugees, but we count the ration that everyone receives in a physical measurement. This is so because incremental changes in most goods, and certainly emission budgets, cannot be directly translated into changes in human wellbeing. On a country level, human wellbeing can be measured, for example, by the Human Wellbeing Index, the Weighted Index of Social Progress, or the Human Development Index (HDI), which is the most accepted indicator of human wellbeing.

The ranking of countries with the highest current greenhouse gas emissions differs significantly from a ranking of countries according to their citizens' wellbeing, as Figure 1 shows. It is thus inadequate to replace the absorptive capacity of the atmosphere (one of its functions, measured with a physical metric) by the wellbeing we draw from it.

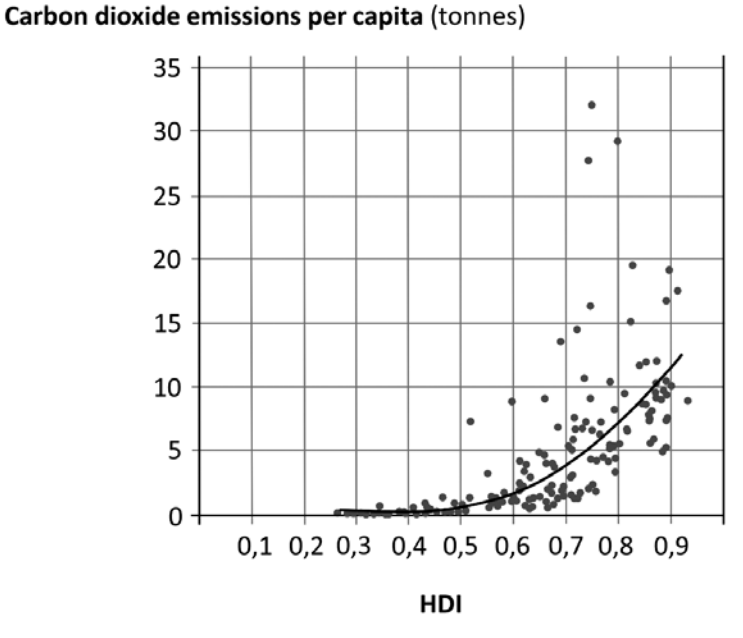

Figure 1: Relationship between Quality of Life (HDI) and current CO_2 emissions per head. Source: UNDP (2011): *Human Development Report 2011*. Basingstoke: Palgrave Macmillan, p. 26.

Option b), that is, to view 'economic growth' or 'chances for development' as the object of distribution, is even more problematic. As demonstrated below, the relationship between greenhouse gas emissions and chances for development are complicated. Economic growth does not result from greenhouse gas emissions alone; other ingredients (hard work, for example) are necessary as well. And, most importantly, a high Gross Domestic Product (GDP) has no intrinsic value in philosophy; rather, it is a means to an end. In welfarism, this end would be human wellbeing.

A further suggestion is to not distribute greenhouse gas emissions, but rather to distribute the costs of mitigation as measured by lost GDP-growth (Miller 2009, 145-151). Miller calls this 'the principle of equal sacrifice.' Despite some positive secondary effects, this proposition must also be repudiated. First of all, Miller's premise 'that the reductions required will in almost all cases be costly in terms of foregone economic growth and personal consumption' (Miller, 2009: 145), is disputable because it ignores population change as a major factor in climate change. As long as couples in many parts of the world are forced to have more children than they want due to a lack of contraceptives, one cannot classify 'having fewer children' as 'costs' (be it direct costs or opportunity costs or costs in a symbolic way in the sense of sacrifice). Secondly, how high the GDP in a particular country during a given reporting period would have been without measures of climate protection is hardly legitimately quantifiable (as Miller admits). It is even possible that such measures increase the GDP, because some goods (e.g. CO_2-capture complexes) and services (e.g. advising the population with respect to building insulation) would be included in the GDP calculation.

After scrutinising these options it may be said: greenhouse gas emissions, or its correlate, the 'absorptive capacity' of the atmosphere should be regarded as the climatically relevant object of distribution. Of course, they are no synonyms, but in the context of the object of distribution they are interchangeable, as one is the sink, the other one is the thing that fills the sink.

The following chain of reasoning applies:

1) Human and environmental suffering as a result of climate change should be avoided. Consequently:
2) A global temperature rise, a rise in sea level and an increase in extreme weather events must be minimised. Consequently:
3) The cumulative amount of greenhouse gases in the atmosphere must be stabilised in the long term.

To stabilise the accumulated amount of greenhouse gases in the atmosphere in the long term, the global emissions budget for greenhouse gases between 2010 and 2050 is 560 billion tons of CO_2^e (560 Gt CO_2^e).[2]

2. Scientists use complex computer models to convert CO_2^e-emissions into CO_2^e-concentrations in the atmosphere and then predict its effects on temperature, sea level and weather. Although

3. INTERGENERATIONAL JUSTICE

How should atmospheric resources be divided between the members of present and future generations? As stated above, the presently living generations should not fill up the atmosphere with more than 560 billion tons of CO_2^e between 2010 and 2050 if a dangerous rise in global temperature is to be avoided. This notion of a safe emissions budget is a restriction for the current generations' consumption of atmospheric resources during their lifetimes. Theoretically, we could arbitrarily set this available budget to 1,000 billion tons and gain more leeway for distribution schemes in the present, e.g. between North and South. This manoeuvre – beneficial for the existing generations, but at the expense of future generations – would contradict what intergenerational justice demands from us. Our moral obligation to stick to the safe emission budget[3] and thus to prevent dangerous climate change, rests on two arguments: the potentially cataclysmal consequences of climate change and the low costs of a second-order error.

The problem of uncertainty is crucial in this puzzle (Page 2006; Partridge 2008). Each generation faces the problem that they can only vaguely predict how effectively and efficiently the next generation could reduce emissions and adapt to changing climatic conditions. The time-delayed nature of the consequences of our climate-related actions compounds the problem. However, there is strong evidence that the greenhouse effect may occasion many additional deaths and enormous costs for coming generations.[4] Of particular relevance are the so-called tipping points of climate change. This refers to changes that begin when a certain concentration of greenhouse gases in the atmosphere is reached and, once instigated, are self-accelerating and irreversible. The climate system is a non-deterministic system with an almost infinite number of variables, in which processes occur according to the chaos theory. In such a system, one cannot predict with certainty what will happen, but rather only probabilistically with a higher or lower degree of certitude. One of the most feared consequences of human-induced temperature rise is the melting of the Greenland ice sheet. This would cause the sea level to rise 6–8 metres;

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these calculations are much more precise than ten years ago, they are still fraught with uncertainties. Estimates of how much greenhouse gas the atmosphere can tolerate, that is, how high the cumulative surge caused by people can be, vary significantly. For the time span until 2050, 560 Gt CO_2^e is a plausible mean value. The physical correlations are important but not decisive for the ethical debate. The conclusions derived here apply regardless of whether the environmentally sustainable mass of accumulated CO_2^e -emissions is 200 or 800 Gt CO_2^e.
A related point: in the political and ethical debates, one often hears and reads 2 tons of carbon dioxide, not carbon dioxide equivalents. For the ethical chain of arguments in this essay, however, this differentiation is not important.

3. The exact size of the safe emissions budget can and should be redefined by natural scientists whenever new findings arise.

4. There is broad consensus that the greenhouse effect will incur human costs, especially in southern countries, see e.g. Kovats/Campbell-Lendrun/Matthies (2005).

several countries would completely disappear from the map and others would permanently lose large coastal cities. No serious scholar can eliminate this possibility or definitively prognosticate its occurrence. From an ethical standpoint, mid-level magnitude damage with a medial occurrence probability has to be judged differently than highly destructive damage with a small probability of occurrence, even if both scenarios produce the same expected value. To sum up, the expected value principle is suitable for the medium range, the precautionary principle for the extreme.

Another argument for the precautionary principle is the low cost of a second order error. In other words: if we remain idle because we assume that there is no man-made climate effect/temperature increase/rise in sea level and we are wrong, the consequences are catastrophic. If we change our behaviour because we believe that there is a man-made climate effect/temperature increase/rise in sea level and we are wrong, the consequences are not dramatic. Fossil fuels will be exhausted in the foreseeable future; therefore, it does not make much difference whether we expedite the transition to the post-fossil age by a few decades. Ethicists agree almost unanimously that the protection of future generations requires the application of the precautionary principle.[5]

In this context, the hypothesis of a 'rich future', which states that the future will always be better than the present, is interesting. As early as 1785, Kant wrote the following on generational relationships: ' What remains disconcerting about all this is, firstly, that earlier generations seem to perform their laborious tasks only for the sake of later ones, so as to prepare for them a further stage from which they can raise still higher the structure intended by nature; and, secondly, that only later generations will in fact have the good fortune to inhabit the building on which a whole series of their forefathers (admittedly, without any conscious intention) had worked, without themselves having been able to share in the happiness they were preparing.' (Kant 1949, 6). Rawls also assumed an 'autonomous social savings rate' (Rawls 1971, 319–335) and thereby a quasi-natural constant improvement of the living conditions of future generations. Caney explains what the 'rich future' argument means with regard to climate change: 'The thought here is that future generations will be wealthier than current generations and hence more able to pay; as such an 'ability to pay' criterion should allocate duties to them. This, in effect, amounts to a policy of not preventing climate change for now and then trying at some point in the future both to prevent further climate change and also to adapt to the changes that have occurred.' (Caney 2010, 220). According to this view, the argument that because of the abrupt climate change future generations will be worse off than they would have been without it (Shue 2010, 150) has little weight. Because the lot of currently living generations in sum is worse than that of future generations, it would be unfair to demand a sacrifice from the

5. On behalf of the commonality, see Shue 1999. For an opposing view, see Hillebrand/Ghil 2008.

current generation for the sake of future generations. The deferral of ecological burdens – such a global warming – is considered to be legitimate, since the capacity to pay of future generations is believed to be greater than that of today's generation (Lomborg 201, 323).

There are certainly empirical facts to support the view that the global standard of living is currently increasing. For instance, the Human Development Index (HDI) has increased globally in recent decades despite the onset of climate change. For the average citizen of the world, who is the subject of intergenerational justice, per capita income, life expectancy and level of education are higher today than in the previous or pre-previous generations. The HDI of Bangladesh, particularly hard-hit by the greenhouse effect, rose between 1980 and 2011 even faster than average, from 0.303 to 0.500.

In spite of this, the 'rich future' argument remains unconvincing, because it implicitly suggests that it would be fair if a future generation were exactly as well-off as its predecessor. But intergenerational justice means making possible not an equally good but rather a *better* life for future generations. This is the result of an application of the 'Veil of Ignorance' in the intergenerational context (Tremmel 2009). We should leave a better world to our descendants and reject the view that it suffices morally to leave behind a world that is as good as it was. Intergenerational justice means that the members of the next generation, on average, must be able to realize not just an equal level of well-being, but a higher level. As our normative obligations to future generations are greater than many ethicists assumed, the 'rich future' argument loses its basis. The concept of 'intergenerational justice as making improvement possible' (Tremmel 2009, 196) does not mean, however, that the current generation should make sacrifices for the next generation. If a resource has to be distributed between two generations of equal size, it is absolutely legitimate that each generation is guaranteed half of the good. But then how can a higher standard of living evolve for the later generation? This apparent paradox dissolves when one considers the autonomous factors of progress. Even if earlier generations neither save nor sacrifice, inventions and innovations that increase resource productivity will inevitably be discovered or created. The members of generation A do not have to give members of the next generation B more than they received; if they give them just as much, they implicitly enable their descendants to fulfil their own needs better than A. The precondition, however, is that catastrophes that could lead to rapid and extensive losses for human well-being be averted by the current generation. It is therefore the most important duty of every generation to avoid war and environmental, social and technical catastrophes (Tremmel 2009, 170).

Climate change is one of the potential catastrophes that could descend on coming generations. The above cited assertions from Kant and Rawls concerning the betterment for posterity do not constitute laws of nature – on the contrary, the fate of coming generations hinges on our actions. In the case

of climate change, future generations' costs for assimilation are presumably much higher than the current generation's costs for prevention. And as Caney points out, it would be immoral to knowingly cause harm to future generations (Caney 2010, 220). The fact that someone is in a position to redeem himself, for example in the case of theft, to personally replace the stolen good, does not legitimise the theft itself. In fact, because of the tipping points depicted above, it is very probable that acclimation by financial means will not be possible at all, and the high numbers of dead and injured can only be deplored.

4. PURE DISTRIBUTIVE JUSTICE

Keeping in mind our provisions for future generations, how can atmospheric resources be fairly distributed among members of present generations? According to the maxim of pure distributive justice (without further assumptions), the 'presumption for equality' applies: Everyone gets an equal share of the pie, i.e. every person has the same greenhouse gas emissions budget. For a (static) world population of approximately 7 billion people and a 'safe emissions budget' of 560 gigatons, this results in a per capita emissions budget of 2 tons per year between 2010 and 2050.[6]

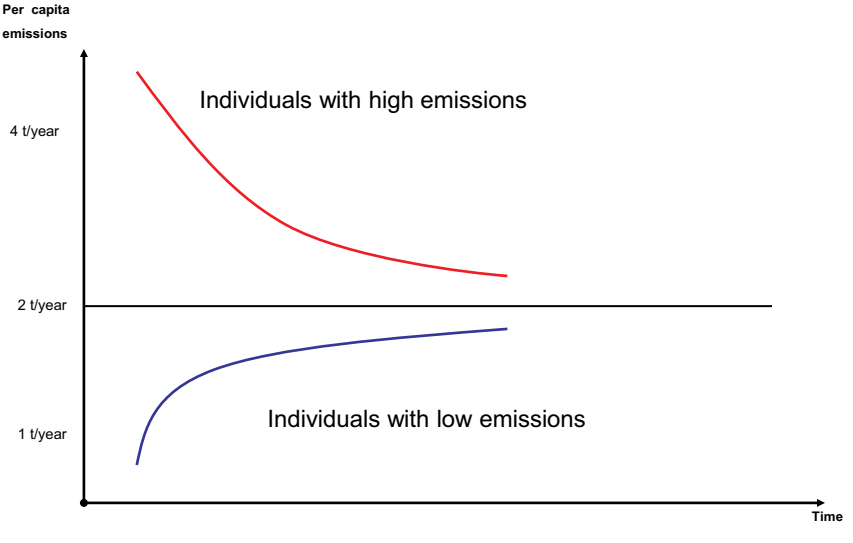

Figure 2: Contraction and Convergence: Emission Egalitarianism assuming a constant population of 7 billion

6. 560 Gt divided by the number of people (7 billions) and years (40 years).

As Figure 2 demonstrates, this concept calls for individuals with high consumption levels to adapt their behavior to comply with an emissions limit of 2 tons per year, while individuals with lower than 2 tons of emissions per year are allowed an increase. This is also the target value used in political negotiations to limit the average global temperature increase to 2 degrees.

Dividing the limited budget by the number of individuals corresponds to the ethical stance of emissions/certificate egalitarianism. It grants each person on the planet an equal share of the atmospheric resources. This approach, also called 'Contraction and Convergence', is currently the concept that is probably the most advocated in ethics.[7] According to Page, it 'seems congruent with both 'contribution to problem' and 'ability to pay' arguments for differential responsibility, yet it does not depend on either of these for its essential justification. The approach does not assume that those that must make the biggest changes in their environmental practices were responsible for the climate problem either historically or contemporarily.' Moreover, it

> seems consistent with a range of theories of the profile of justice. It will be attractive to egalitarians ... as it will reduce inequalities between developing and developed countries, and between generations ... It will also tend to improve, relative to rival approaches, the position of the worst off ... Finally, it will be attractive to those who wish to bring as many people as possible to the point where they have enough since the measures it will introduce will benefit many millions of people in developed and developing countries who lead, or will lead, lives lacking in what is needed for a decent life without bringing more than a very limited number of people below the sufficiency level. (Page 2006, 178).

One could bring forth the 'climate region argument', contending that this allocation is too simplistic: people in temperate climates who, objectively speaking, need less energy for heating or cooling, are given the same budget as people who live at the equator or in polar regions. However, it would be incredibly complex to calculate how much more energy per person is needed for people in extreme climate zones than for those in moderate climate zones. After all, people often migrate during their lives. And moreover, climatic zones also change, precisely because of climate change!

A further objection is based on John Rawls' 'difference principle':[8] 'Social and economic inequalities ... are to be to the greatest benefit of the least-advantaged members of society'.[9]

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7. Proponents are, for example: Page 2006, 177–179; Singer 2002, 39–40; Meyer 2001; Paterson 1996. The concept of equal distribution per person has been advocated in international politics in the last few decades most notably by developing countries. Of late, even the German chancellor Angela Merkel has committed to this policy; however, she does not want to see it enacted until 2050.
8. I credit Ernest Partridge for this hint. Although I don't share his intuition, it is an important argument.
9. This is the wording in Rawls 2001, p.42.

For example, if everyone were compensated equally, who would expend the time and energy necessary for being educated as a doctor? In this case, differential salaries for such fields also benefit the society's weakest members. If we were to apply this to 'climate logic', this would mean that resource- or emissions-intensive professions may sometimes benefit all of humanity. In these cases, according to the difference principle it would be allowed, indeed morally imperative, to deviate from the principle of egalitarianism. Like the 'climate region argument', this argument based on the difference principle is intellectually appealing but hardly viable on a practical level. The actors requiring more emissions than average would have the burden of proof. An audit authority would have to be established to determine whether their CO_2-intensive activities actually benefit the weakest members of society. That seems hardly feasible.

Prioritarianism, on the other hand, awards a higher CO_2^e budget to people with little wealth or resources precisely for this reason. Several NGOs as well as developing countries put forth the 'Greenhouse Development Rights Model' as an alternative to 'Contraction and Convergence', because it combines development aid with climate related adaption aid for the Less Developed Countries (Heinrich Böll Foundation 2008). They say that 'Contraction and Convergence' alone is not fair enough, and furthermore, with their model one can kill two birds with one stone (Baer/Athanasiou/Kartha/Kemp-Benedict 2010). This, however, confounds the climate problem and the general problem of poverty, thus confounding two different reasons for redistribution between the rich global north and the poor global south. I focus here on climate-ethical considerations. Poverty, sickness, malnourishment and high infant mortality rates are important concerns for the international justice debate and were so before climate change became an issue. I see no reason to incorporate these issues with climate ethics theories.

Given these inconsistencies of prioritarianism, the concept of 'Contraction & Convergence' (C&C) seems to be the better vantage point for considerations concerning the distribution of greenhouse gas emissions.

Politically, the question of the transition timetable is highly controversial. From an ethical point of view it should be relatively short, because circumstances deemed fundamentally immoral should be remedied as quickly as possible. The argument that some individuals who currently consume at rates much higher than the 2 tons/year goal would have to rapidly and radically alter their lifestyle is a correct but for ethics inconsequential counter-argument.

5. INTERNATIONAL JUSTICE

International justice addresses justice between countries, regardless of distribution practices within the respective countries. Pure distributive justice could only be applied if we had one world government that allocated resources fairly among its citizens. The international domain, however, is divided into countries vying for influence and in possession of various bargaining powers, many of whom strictly pursue national interests.

According to emission egalitarianism within the concept of international justice, high-emission countries and low-emission countries should meet in the middle (2 tons per capita per year). States whose citizens currently release too many greenhouse gases into the atmosphere must reduce their emissions (or buy the relevant certificates). States with low emissions levels have room to breathe – or emit.

As a rejoinder, one could argue in favour of a 'Rawlsian difference principle' on a country level. According to this view, we should first ask what the high-energy usage in developed countries is accomplishing – in particular, for underdeveloped countries. One could argue that the high energy use in the developed countries supports scientific and technological R&D which, with wise policies, might provide solutions to the energy and population based emergencies ahead. It follows that there may be an 'international difference principle' at work, whereby (following Rawls) unequal national per-capita energy use is justifiable if that unequal distribution works to the advantage of the low-use nations. As mentioned in the section on pure distributive justice, I find this thought plausible but I believe that the burden of proof lies with the high-emitting countries. At the moment, these countries do not appear to be using their extra emissions to the benefit of mankind, rather they maximise their own wellbeing at the expense of other nations.

Figure 3 shows carbon dioxide emissions of various countries per person per year. Of the industrialised countries, the USA leads with 19.74 tons per capita, followed by Australia (19 tons/person). Germany and the UK are around 10 tons per person, while France emits approximately 6.5 tons per capita and China just under 5 tons/person. It is important for the political debate that many developing countries also exceed 2 tons/person. For example, the average person in Mexico emits 4.4 tons/year and in Jordan 3.6 tons/year. Those under the 2 tons/capita limit are the citizens of approximately 100, predominantly African, South American or Southeast Asian countries, e.g. Costa Rica (1.8 t/person), Zimbabwe (0.8 t/person) or Bangladesh (0.3 t/person).

Implementing international justice, however, can conflict with principles of pure distributive justice. Let us assume that a citizen of a high emissions country, say a Londoner, lives extremely energy consciously. She foregoes trips that require flying,[10] commutes only by bike and seldom turns the heater on in

10. For instance, a one-hour flight (economy class) amounts to about 0.1 tons of CO_2/person.

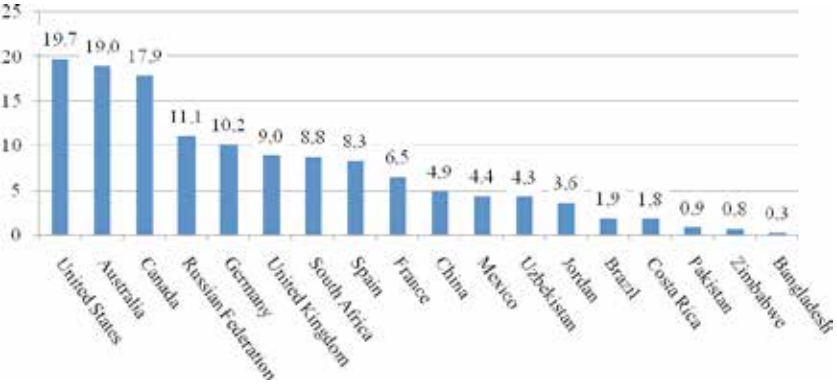

Figure 3: Carbon dioxide emissions per capita per year compared by country (2007). Source: UNSD Millennium Development Goals Indicators database (see http://mdgs.un.org/unsd/mdg/Data.aspx).

Technical Note: This figure is a calculation of CO_2 emissions only, i.e., without other greenhouse gases.

the winter. Because this person has the misfortune to live in a country where the majority of her fellow citizens waste a lot of energy, then she might, in the context of a climate treaty based solely on the concept of international justice, nonetheless have to participate in a financial transfer from the UK to developing countries, at least in some institutional designs.

CO_2 emissions limits are not only about the output of each individual, but also how many people live on earth altogether. The Fourth Assessment Report of IPCC (2007) states,'gross domestic product per capita and population growth were the main drivers of the increase in global emissions during the last three decades of the twentieth century' (Rogner et al., 2007).

In the twentieth century, the world population rose from 1.6 to 6.1 billion, i.e. it almost quadrupled. The biggest part of this increase – 80 per cent – took place in the second half of the 20th century. Now, there are more than seven billion people on earth.

According to the UNFPA, 40 to 60 per cent of the rise in CO_2^e emissions can be attributed to population growth (UNFPA, 2009: 21). In terms of absolute emissions, countries with a growing population will generate an ever-growing proportion of global emissions, whereas the share of total emissions of nations with decreasing population trends will decrease. Table 1 illustrates this phenomenon by comparing population trends in Germany and Pakistan.

Table 1: Development of the absolute climate gas emissions of Germany and Pakistan

	2010	2020	2030	2040	2050	2060	2070
Germany							
CO_2/person/year	9·5	9·5	9·5	9·5	9·5	9·5	9·5
Population (in millions)	83	81	79	76	72	68	64
Absolute CO_2	788	769	750	722	684	646	608
Pakistan							
CO_2/person/year	1·8	1·8	1·8	1·8	1·8	1·8	1·8
Population (in millions)	173	203	231	254	271	278	282
Absolute CO_2	311	365	415	457	488	500	507

Source: UN Population Division (2013). Medium variant. Alternative data sources present slightly different numbers, but the trend does not change. The CO_2-emissions per person per year are held constant to show the ceteribus paribus effect of population changes. In reality, there may be rebound effects.

Can or should population size be taken into account in a concept of international justice? It is clear that given current population growth trends, emissions limits will have to be less than the current limit of 2 tons per person.[11]

Given this phenomenon, the ethical-political question arises as to whether population growth should be taken into account in determining emission limits for individual countries. It is conceivable to 'reward' a country with a constant or declining population by allowing it to produce more greenhouse gas emissions than a country with rapid population growth. The acceptability of factoring in population changes largely depends on our general stance on population policy. Those who view population policy as something that is not and should not be influenced by politics would argue against including population as a variable in determining emission limits of individual nations.

11. By the way, this shows that there cannot be inalienable rights to a certain amount of greenhouse gas emissions, not even those emissions indispensable for a minimum standard of living (cf. Tremmel/Robinson 2014). With a growing population, the ration of a scarce resource per head must be constantly re-calculated. A proclaimed absolute right to the atmosphere in general, however, is not amenable to the continually fluctuating amount of emissions to which each person is entitled.

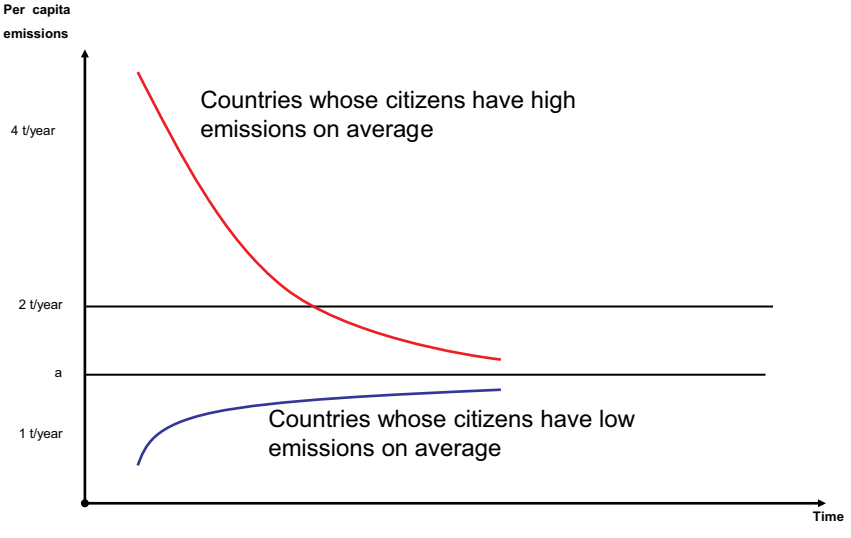

Figure 4: Contraction and Convergence for international justice: Population 9 billion, population policy inadmissible.

To illustrate this view, Figure 4 assumes that population is an exogenous variable that is not and should not be influenced by governments. Those countries which presently consume a lot must therefore reduce their emissions even more drastically than in Figure 2 which assumes a static population. The leeway for increased emissions in countries currently consuming less would also be diminished. With the premise that the safe emissions budget remains 560 Gt, the morally legitimate per capita emissions move towards 1.5 t.[12]

In Figure 5 it is assumed that a government of a country can and should influence its population size, which in turn becomes an endogenous variable. If population policy is seen as ethically and politically admissible, then it is appropriate to factor in population trends in the determination of national emission budgets. Should the allocation of emission allowances occur today, with a world population of around 7 billion people, countries with subsequently constant population counts would have in a world with 9 billion people in 2050 more emission allowances per capita than those of growing countries. If the average morally legitimate emission budget were, say, 1.5 t/head in 2050,

12. Line a is drawn as a parallel to the x-axis for reasons of simplicity. In reality, the population only eventually grows from 7 to 9 billions between now and 2050, making the morally legitimate per capita emissions an eventually shrinking variable as well.

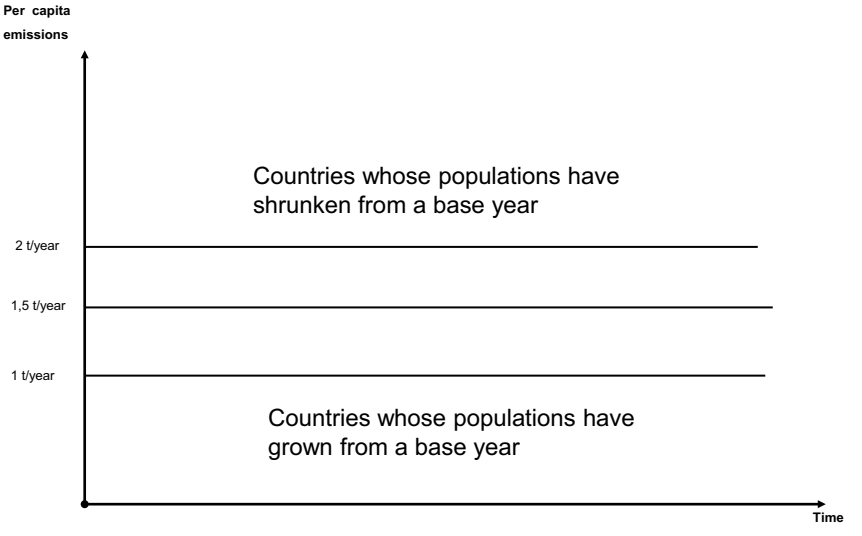

Figure 5: Contraction and Convergence for international justice: Population 9 billion, population policy admissible.

countries whose populations have grown from now would have for instance 1 t/head whereas countries whose populations have shrunken would be allocated 2 t/head. If the distribution (grandfathering) were to take place at an earlier date, 1990 for example, the ratio would shift further to the advantage of those countries whose population has not grown or even shrunk since then. In any case, population changes going forward from some base year are relevant to how emission budgets should be distributed. The population policy debate is too complex to be included here, but as I argued elsewhere, not all population policies are immoral per se (Tremmel 2008). On the contrary, the state is free, within reason, to implement incentives to promote an anti-natalistic approach to fertility among its citizens.

6. HISTORICAL JUSTICE

Historical justice is often grouped with intergenerational justice since both concepts deal with 'justice in time'. This, however, is an analytical deficiency. Historical justice divides a generation into groups, namely, at least one injured party and one at-fault party. Intergenerational justice, on the other hand, deals

with justice between members of different generations each represented by an average individual of its epoch.

Historical justice is (thus far) a highly controversial ethical concept in which there is much less consensus among ethicists than in many other areas. 'Historical injustice' is usually defined as a violation of the rights/interests of deceased people by other departed. Those currently claiming injustice and those accused are descendants of the perpetrators or victims (Meyer, 2004: 10). Key questions of 'historical injustice' are: How should we deal with immoral deeds of deceased individuals, the negative effects of which are felt to this day, especially such acts committed under the aegis of a rogue regime?[13] Do the descendants of the by this time deceased perpetrators still have obligations to the descendants of the victims of historical misdeeds, for example the return of stolen objects (usually territories) or compensatory payments? How far back in history can we go to atone for past misdeeds?

As it relates to climate change, emerging countries demand recompense from industrialised countries for emissions as far back as the Industrial Revolution (ca. 1850). Between 1850 and 2002, industrialised countries emitted three times as many greenhouse gases as developing countries (Baumert et al, 2005: 31). Consequently, more than half of the sanctioned greenhouse gas budget for all mankind according to current targets has already been consumed. Industrialised countries (North America, Europe and the former Soviet bloc) are responsible for the lion's share of this consumption. Based on this, one could support a right to 'overshoot' for low-emission countries.[14]

As shown in Figure 6, the citizens of low-emission countries (often but not always developing countries) would be allowed to exceed the level of 2 tons per year initially, but then must converge down to this mark. Countries with the most emissions, on the other hand, would have to significantly reduce their consumption until the historical encroachments of their countries have been compensated. They may then raise their emissions limit to 2 tons/person/year.[15]

However, the question arises in general as to whether the concept of historical justice can be applied to climate change. Let us discuss two analogies that facilitate the developing of ethical conclusions.

Analogy 1: Two hikers have a ration of ten litres of water and twenty apples available for a walk. Halfway through the hike, one traveller (the North) has consumed half of the rations. Now he begins aggressive negotiations with the other traveller (the South) to decide how the remaining five litres of water and ten apples should be allocated.

13. See among others Miller/Kumar 2007; Meyer 2004; Caney 2005.
14. In the context of historical justice, the term 'low-emissions countries' refers to the accumulated historical emissions, not the current absolute or per capita emissions.
15. During the Kyoto negotiations in 1997, Brazil proposed to include historic carbon dioxide emissions starting in 1840 in a climate treaty.

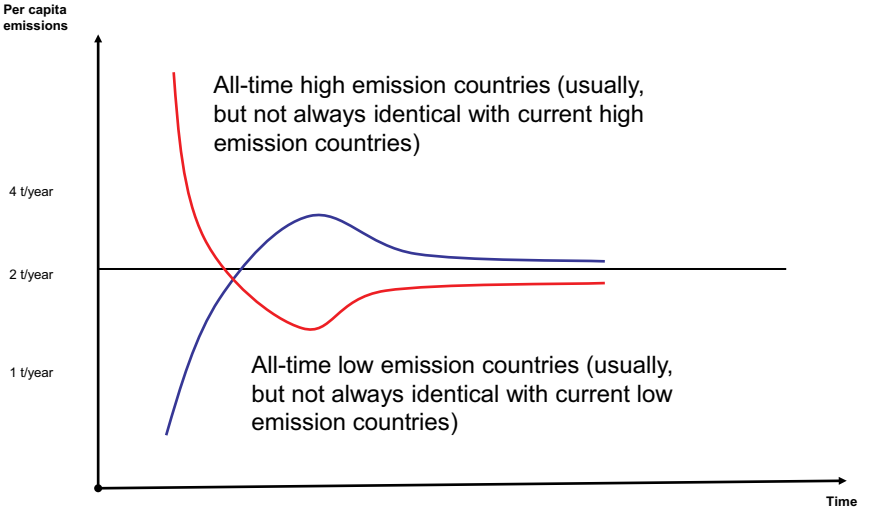

Figure 6: Historical justice, 'overshooting' for countries with low accumulated emissions

It is understandable that dividing the rest of the rations equally seems completely unfair to the hiker who has not yet had anything to eat or drink. Consider, though, a reverse analogy:

Analogy 2: A hiker is alone on a trip and gets hungry. When he discovers an apple tree, he shakes the ripe apples from the tree and eats until he is full. A little while later, a second hiker arrives at the same place and complains that he cannot stave off his hunger. He would have liked to have had half of the apples.

In this example, no one would claim that the second hiker had a right to the apples from the start and can therefore demand compensation.

Imagine two generations of US-Americans and Pakistanis – one living at the end of the nineteenth century during the Industrial Revolution, the other in the present.[16] The Pakistani generation in the nineteenth century produced virtually no greenhouse gases; the American generation, however, did. Let us further assume that the Americans derived benefits from their CO_2^e production, e.g. in the form of a significant increase in the standard of living. This advantage was passed down through generations, guaranteeing Americans today a level

16. Example taken from Gosseries, 2004.

of prosperity well above that of today's Pakistanis. Furthermore, let us assume that the historical emissions of the deceased Americans are directly responsible for damages concerning today's living Pakistanis, for instance through flooding or crop failures. Do the current U.S. citizens owe the current population of Pakistan compensation for the emissions of their American ancestors? Should the present inhabitants of the largest polluting nations compensate the victims of the greenhouse gas emissions of their ancestors generally?

Before we begin to answer these questions, a few assumptions should be formalised and clarified. The relationship of wellbeing between two parties can exist in the following forms:

- Actions that increase the wellbeing of party A while diminishing the wellbeing of party B (Win/Lose).
- Actions that increase the wellbeing of party A and have no effect on the welfare of party B (Win/0).
- Actions that have no effect on the wellbeing of party A but diminish that of party B (0/Lose).

We must clarify whether a lose-situation exists in conjunction with climate change and if so, to whom and to what extent. According to current research in the natural sciences, historical emissions are at least partially causally responsible for current natural disasters – this is an example of 0/Lose, as affected regions undoubtedly incur damages due to such incidents. From a moral point of view, however, these cases of loss are fundamentally different from the distribution of the 'absorptive capacity' of the atmosphere. Consider a modification of Analogy 2, the following Analogy 3:

Analogy 3: A hungry, solitary hiker (A) happens upon an apple tree. To satiate his hunger he begins to harvest the apples. In the process, he shakes the tree and unintentionally sends an apple rolling. With great momentum, it falls on the head of a second hiker (B) much further down. This injures the second hiker quite badly.

A has two moral issues to resolve with B: First, he (without guilt and indirectly) ensured that the second hiker had nothing to eat (a question of distributional justice). Second he (likewise without guilt, however directly) inflicted pain on B (a question of compensatory justice). As concerns climate change, these should be addressed as two separate moral issues as well. It is not helpful to couple both concepts in statements like, 'The North filled up the atmosphere with its greenhouse gases more than was admissible, and now the South has to endure the consequences in that it especially suffers under global warming and heavy flooding.'

What, then, is the status of the distribution of the 'absorptive capacity' of the atmosphere? Is the historical depletion since 1850 an example of Win/0,

that is, that A's situation improves while B incurs no damages (and therefore ethically irrelevant)? Or does the use of fossil fuels by nations industrialised early on illustrate case 1 (win/lose)? Someone who discovers and uses a resource on his own, in my example an apple tree, does not *prima facie* inflict harm on anyone else. Objectively, however, hiker B cannot eat precisely because A satiated his hunger a few hours earlier. As it concerns the absorptive capacity of the atmosphere, even if earlier generations' consumption thereof was legitimate at the time of use, the current situation does not fulfil John Locke's dictum, 'as much and of the same quality may remain'.[17] Though indirect, a worsening of the situation occurred/is occurring all the same. In conclusion, we are faced with a win/lose situation and therefore one that falls into the jurisdiction of the ethicists.

In the following, we will consider whether the global North is obligated to offer some sort of compensation for its early access to the absorptive capacity of the atmosphere. What counter-arguments may be cited? First, the general question arises as to what extent responsibility or fault can be carried over from an earlier to a later generation. In liberal concepts of political theory, each generation of citizens is to be regarded as his/her own demos and not as part of a generational chain. Most liberals deny any inheritance of guilt on the individual level, from father to son, from mother to daughter. It is debatable whether the inheritance of guilt postulate can be applied to countries. On this level, changing national borders present a strong counter-argument to the concept of the inheritance of guilt or responsibility. Should the Uzbek state be accountable for greenhouse gases emitted in the Soviet Union in the region that is now Uzbekistan, though it was not founded until 1991? This seems unfair. A further problem emerges when a land was not democratically governed at the time of its emissions: South Africa is a substantial all-time emitter. However, this is largely because of the policies and actions of the Apartheid government – the black (majority) population profited little. Should the now democratic government be held responsible for all of South Africa's historical emissions? Hardly. These examples show that, on a national level, current generations should not always have to take responsibility for the deeds of earlier generations.

A second argument against compensation is the innocuousness of the burning of fossil fuels, i.e. the absence of immorality in the act of utilisation. The burning of fossil fuels was and is not deemed inherently bad by any society at any time. A warming fire, a car drive, even a flight are decidedly different from murder, theft and homicide. Only for the latter group of undertakings does the term 'reparations' seem appropriate. A further aspect of innocuousness, largely ignored in the literature, is the evaporation of greenhouse gases over

17. Locke 1965, Part IV 309, 328–333. Locke postulates that God gave men in their natural state equal rights for the use of the earth and its resources. He concludes that under this condition, every single person can acquire as much land as he/she wants, given a) he/she uses what she has appropriated and b) he/she leaves enough of the same quantity and quality for others.

time. When calculating historical emissions, it makes a big difference whether every ton is equally weighted or if one considers that some greenhouse gases have already partially evaporated, thus making the countries' share of the current concentration of greenhouse gases in the atmosphere due to their historic emissions different from their share of historical emissions.

A related but not identical counterargument against compensations, thus the third, is the ignorance of the consumers. At the time of the Industrial Revolution, climate science did not exist, and the global warming effect of carbon dioxide and other gases was unknown. Scientists discovered the essential correlations of anthropogenic climate change by degrees. In the first IPCC report in 1990, the majority of scientists around the world supported the hypothesis that the current climate change was man-made. This hypothesis was solidified in the second IPCC report in 1995. Today, the accumulation of CO_2^e in the atmosphere is no longer seriously doubted. Therefore, the publication of the first IPCC report in 1990 can be seen as the point in time from which the argument of ignorance is no longer valid.

A fourth argument: The premise for any legitimate claim of the South against the North is a betterment or advantage for the currently living due to the historical emissions of the North. The essential question of whether people living today have an advantage as a result of historical emissions is ultimately an empirical question: Can the developmental head start of certain countries be attributed mainly to their copious greenhouse gas emissions in the past? Or do other factors such as work ethics and diligence, dexterity and creativity play a more important role? Can the comparatively slow development of other countries be traced back to low past levels of greenhouse gas emissions? Or are other factors (partially) responsible?

It seems to me that further empirical research is necessary to assess the relationship between a country's historical emissions and its citizens' current quality of life. If however, empirical research were to show that this correlation is strong, the following Analogy 4 would apply:

Analogy 4: Hiker A and hiker B are hungry and go for a walk. They see an apple tree. Hiker A has a basket and fills it up with apples; hiker B has no basket and is only able to take enough apples to cover the energy used for the walk. Once back in the village hiker A and his daughter eat half the apples and hiker A saves the other half for later. Hiker B takes the hint and spends the evening making a basket. Unfortunately, both hiker A and hiker B die during the night and leave all they have to their daughters. Daughter A gets a basket and half a basketful of apples while daughter B gets a basket. Daughter A and daughter B go on a walk with their baskets. They see a second apple tree. They come to learn that there are only two apple trees in existence (making this second tree also the last one).[18]

18. I credit an anonymous reviewer for this example.

In this case, it would be fair to let daughter B alone harvest the second apple tree.

What is the upshot regarding historical justice? The weight of the four counterarguments (only the fourth yielding an unclear result) against claims based on historical emissions is so considerable that there is no moral obligation for the North to compensate the South for initial access to the scarce 'atmosphere' (before 1990). The concept of retributive compensation does not apply. Countries with low historical emissions have no rights to reparations, since they were not wronged in any way. They were harmed, but not wronged. Caney (2010) or Meyer/Roser (2010) arrive more or less at the same conclusion. Meyer/Roser (2010: 235) restrict it to 'those emissions that belonged to people who are now dead and which yield no benefits for the currently living'. Regarding the emissions that do yield benefits for the currently living, Meyer and Roser hold that these benefits have to be shared between the North and the South because justice (distributive justice, not compensatory justice, but still justice) demands this from us. I advocate the view that the idea of justice is not suitable for this cause, but that supererogatory duties demand us to compensate the South for the North's excessive use of atmospheric resources before 1990. Morality is not exhausted merely in complying with mandates of justice. The scope of morality also encompasses good-naturedness, benevolence, sympathy, compassion, altruism, generosity and other such qualities. But of course there is no moral obligation to these supererogatory duties, whereas it would be immoral not to fulfil obligations of justice.

Let us come back to Analogy 2. It was assumed that hiker B did not find any more apples because hiker A had consumed them earlier (without incurring any guilt). Hiker B is at the same point as he would have been had the apples not been available due to a natural cause, e.g., they rotted before he got there, or lightning destroyed the apple tree before the hiker discovered it. Tough luck, one could say. This, however, is not the end of the story. Analogy 2 can be told further, making it Analogy 5:

Analogy 5: After the initial event (A filled himself up on apples, B did not), the two hikers decide to go forward together. In the evening, both are hungry again (B more so than A). They find a second apple tree. A could now let B eat more than half of the apples.

This would be a generous, benevolent gesture though not imperative for the sake of fairness. One hears often from developing countries that countries industrialised early on should cut back on future utilisation of emissions so the developing countries can 'catch up'. Hiker B's higher consumption in the apple tree example corresponds to the overshooting that developing countries would like. There is much to be said for at least partially fulfilling their request out of altruism.

In any case, the question of current emissions remains. Strictly speaking, this is no longer a question of historical justice, because the causal agents as well as those suffering belong to the currently living generation. Therefore, the question of the inheritance of responsibility does not apply. For emissions after 1990, pleading ignorance is no longer a viable argument either. For these emissions, it seems fair that those who have over-consumed up to now are allocated fewer emission rights in their remaining lifetime (Meyer/Roser 2010: 234). Conveniently, in the case of greenhouse gases the solution identified as 'fair' can be based on a person's entire lifespan. From an ethical perspective, therefore, there is a good case for 'undershooting' for the citizens of industrialised countries.

7. CONCLUSION AND OUTLOOK

The bottom line of this article is that:

First, there is a lot to be said for heeding the precepts of intergenerational justice as presented above. This notion of a safe emissions budget is a restriction for the current generations' consumption of atmospheric resources and it limits the leeway for distribution schemes in the present, e.g. between North and South.

Second, the cumulative emissions between 1850 and 1990 should not be taken into account for the purpose of considerations of justice; compensation can (and should) ensue on the grounds of supererogatory duties such as benevolence.

Third, for the sake of justice, countries are accountable for their entire emissions since 1990. This should occur by means of overshooting-rights for a limited time granted to the South from the North.

Fourth, for direct damages caused by greenhouse gas emissions between 1990 and the present, the 'polluter pays principle' applies. All damages to the South that came to pass as a result of the actions of the North are to be compensated to the best of one's knowledge and belief.

And lastly, population changes from 1990 should be taken into account in a climate treaty. 1990 is the year from which climate change – and therewith the contribution of population growth to climate change as well – became known to the global public.

I don't claim that this answer to the question 'What is just with regard to the climate?' is the only possible one. Long (2011) pointed out that disagreement in climate ethics can be reasonable (not founded in error, but in difference) if the empirical evidence bearing on a case is conflicting and complex, and thus hard to assess. This is certainly true for the association between historical emissions and current wellbeing. However, I do assert that my account of climate justice is comprehensive and without self-contradiction.

The effects of climate change pose a serious threat to the needs and interests of those living today and in the future, and this means that we must call for reforms beginning with existing political institutions. There is a growing consensus that the existing institutions are inadequate to prevent climate change (Thompson 2010; Eckersley 2004). A new institutional framework that incorporates the interests of future generations into current decision-making processes is necessary in creating sustainable political systems. This also applies to the established Western democracies: Their development into sustainable political systems is a Herculean task that has nevertheless to be dealt with in the coming decades, because time is getting short. So far, however, not only the practical reforms, but also the theoretical approaches are inadequate. Therefore, there is not only an implementation but also a theoretical deficit. In this respect, new challenges are in store for political science.

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