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Subsistence versus Sustainable Emissions? Equity and Climate Change

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Introduction

In this essay, I will sketch the serious implications that global climate change has with regard to social justice. Secondly, I discuss two proposals concerning equity and global climate change – the "sustainable per capita" approach (Athanasiou and Baer 2002, Singer 2002, Jamieson 2006) and the "subsistence per capita" approach (Shue 1993, 2001, Paige 2007, Baer et. al. 2008). Third, I consider cases where these two proposals conflict. Finally, I argue under plausible considerations, the two proposals will imply very similar policies.

The Problem

One quantity that interests climatologists is termed "climate sensitivity" (ΔT). Climate sensitivity is what the average surface temperature will be at equilibrium when there is a doubling of CO_2 emissions relative to pre-industrial levels. Though there is debate over their exact relationship, generally speaking such a doubling will lead to a temperature increase of 1.5°C – 4.5°C. Here is a graphical representation of climate sensitivity.[1]

[1] This estimate is from the Third Assessment Report of the Intergovernmental Panel on Climate Change (AR3); however, the Fourth Assessment Report of the IPCC suggests an estimate of 2°C – 4.5°C (AR4, 133).

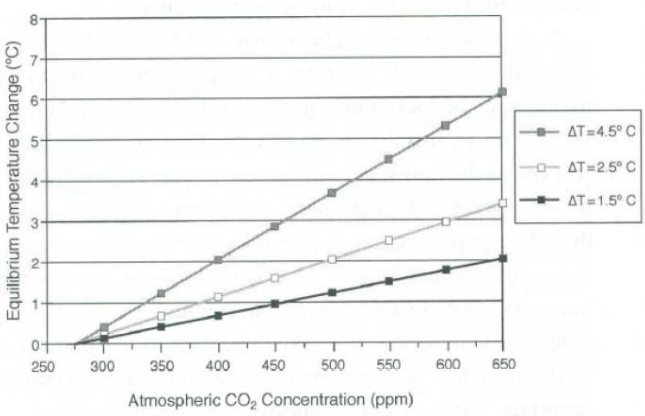

Figure 1. Climate Sensitivity (Athanasiou and Baer (2002))

Thus, on the most precarious hypothesis in Figure 1, holding temperature increases below 2°C implies CO_2 concentrations must remain below 400 ppm (parts per million). Many now believe to meet the 2°C target we must keep our emissions below 350 ppm; hence, the popular "350" movement (http://www.350.org/).[2] For the purposes of this essay, we needn't worry about the *exact* value so long as its roughly 350 ppm. Now, let's look at another graph.

[2] It is worth noting at the Copenhagen meetings in 2009 there was debate over whether 2°C is an adequate target since many vulnerable island states such as Tuvalu wanted a target of 1.5°C.

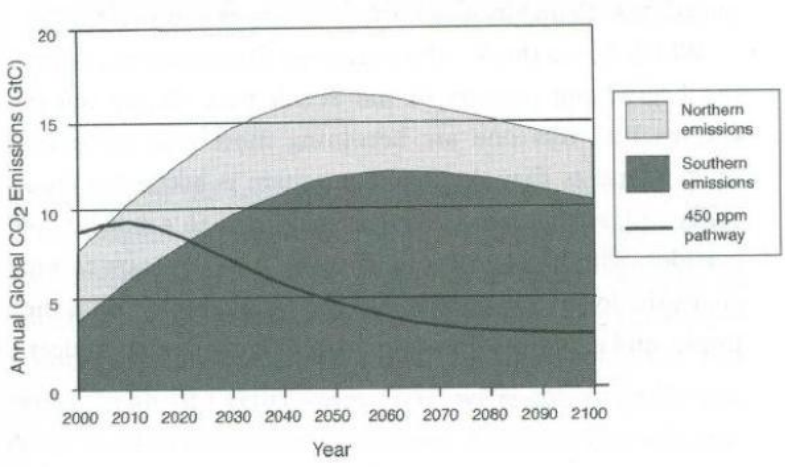

Figure 2. Annual Global CO_2 Emissions (GtC) (Athanasiou and Baer (2002)

In Figure 2, our current global emissions are approximately 8 GtC/yr (gigatons of carbon per year) and in order to stay below 2°C, we must reduce our global emissions to 5 GtC/yr by 2050 and 3 GtC/yr by 2100. It is important to note that Southern emissions (those of the developing world) *by themselves* will be at 8 GtC/yr around 2020. Finally, here is another updated graph depicting more recent information.

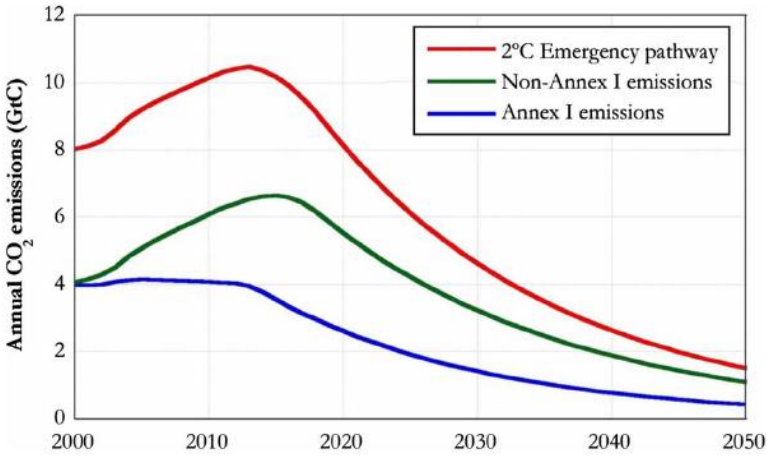

Figure 3. Annual Global CO_2 Emissions (GtC). The red line shows the 2°C Emergency Pathway, in which global CO2 emissions peak in 2013 and fall to 80 percent below 1990 levels in 2050. (Baer et. al. 2008)

In this graph, our global annual CO_2 emissions must peak in 2013 and be under 2 GtC/year by 2050 in order to stay in the safe 350 ppm corridor and avoid an increase of 2°C average surface temperature.[3] Thus, clearly we must greatly reduce our global emissions and very soon if we want to prevent the harmful effects of global climate change including increases in sea levels, heat waves, spread of diseases, species extinctions, wildfires, melting glaciers, and so on.

However, how *should* we distribute GHG emissions if we are to reach our goals by 2050 or 2100? In the ethical literature, there are a variety of proposals but two stand out; that of philosophers Peter Singer and Henry Shue respectively.[4] In this essay I consider these two different approaches to climate equity, the circumstances in which they may conflict, and

[3] Even under this set of projections there is a non-trivial probability this won't be successful; the IPCC scientists assert that it could be as great as 32%.

[4] I select Singer and Shue because they are clear proponents of these views; however, they are not necessarily the originators of these views. For example, prior to Singer's work, Dale Jamieson proposed something very similar which itself was similar to the work of Anil Agarwal and Sunita Narain (1991). Thanks to Dale Jamieson for this point.

whether they can be reconciled.

Before we continue, we should examine one worry political "realists" have – why should largely self-interested nations care about social justice regarding global climate change?[5] First, if the government and citizens of the United States are treating individuals from other countries unfairly, then all things considered morality demands that we alter our behavior. Thus, if one cares about one's moral obligations (or more specifically those regarding the nation to which one belongs), then all things considered one should also care about one's individual and collective duties regarding climate change. However, suppose one either isn't motivated by said moral considerations or denies they exist across nation states. Second then, if individuals or a nation recognize the serious threat of global climate change and desire some international framework for reducing GHG emissions, then that framework must allocate benefits and burdens in a manner that is *seen as fair*. Otherwise, it will not be agreed to, implemented, or enforced by those who understand themselves as being treated unfairly. But, the most effective way to achieve such an international regulatory framework is to distribute the benefits and burdens of GHG reductions *in a fair manner*.[6] For example, in the recent Copenhagen meeting discussions, China was hesitant to have its GHG emissions monitored in a public manner and this was challenged because it was seen as unfair by the United States and other countries.

[5] A political realist in this context is someone who is skeptical of moral claims of fairness or justice between nations though not necessarily so regarding such claims within a nation.

[6] Steve Naderheiden (2008) has an interesting argument that this pragmatic rationale for fairness in GHG reductions will also include issues of procedural justice as well. Developing nations will only consent to agreements about which they have had a role in its formulation. (ibid, 60) Also, Dale Jamieson writes, "The view that duties do not transcend national boundaries (unlike lawyers, guns, and money – not to mention drugs and immigrants) is really equivalent to denying people in the developing world a place at the table. It is the global equivalent of the domestic denial of rights to woman and minority populations" (Jamieson 2006, 37).

Thus, even political realists should take climate justice seriously at least when it is in national self-interest (this is consistent with believing that political realists are not taking climate justice seriously enough of course). So, let's explore different proposals regarding climate social justice.

Two Equity Proposals

When considering equity and global climate change, there are generally two types of proposals considered, *historical* and *time-slice principles*.[7] The articulation of a historical principle essentially proceeds as follows: suppose a party has some holding, did they acquire this holding in a justified manner? If they did not acquire it justly, then they owe compensation to the rightful owner (if any there be). Many ethicists and activists have argued that developed nations have emitted more GHG than was their rightful share and developing nations are thus prevented from similar development via similar emissions. Thus, the developed nations owe the developing nations compensation of some form or other.

Some ethicists, activists, and governmental officials decidedly avoid using historical principles for two reasons. First, even if true, it is extremely difficult to get the global North to provide this compensation; that is, historical principles would not be agreed to by the developed nations like the United States. Second, many ethicists accept that one is only morally responsible for effects one could have reasonably known would occur. Given the uncertainty surrounding climate science until the last few decades (say the first IPCC report in 1990), it can be argued that developed countries are not responsible for the benefits and burdens of the

[7] Of course, one could look at hybrids between the two types of principles discussed. This distinction also appears in Martino Traxler's (2002) discussion of *backward-looking* and *forward-looking* principles.

global GHG emissions but only some relatively recent fraction. As the top US negotiator at Copenhagen Todd Stern said,

> I actually completely reject the notion of a debt or reparations or anything of the like. For most of the 200 years since the Industrial Revolution, people were blissfully ignorant of the fact that emissions caused a greenhouse effect. It's a relatively recent phenomenon. (http://www.nytimes.com/2009/12/10/science/earth/10climate.html?_r=1)

Third, one can argue that developing nations are actually better off since developed nations have emitted the GHG they have. As such, we don't owe them compensation (or it has already been paid as it were). For example, consider what the entrepreneur Jim Manzi writes,

> [W]ould you rather be born at the median income level in Bangladesh today or at the median income level in Bangladesh in the alternative world where the entire Northern Hemisphere had never escaped life at the subsistence level. That is, to live in a world of lower carbon emissions, but no Western science, none of the economic development inside Bangladesh that would not have occurred had the West not developed, no hospitals, no foreign aid, no meaningful chance of ever changing your life? For me (but not necessarily for everyone), the answer is obvious. (http://www.theamericanscene.com/2008/06/17/scientific-american-and-climate-change-i-distributional-ethics)

In response to these arguments, I would offer the following. First, given the pragmatic argument offered above to political realists it seems that historical responsibilities cannot be wholly ignored. Second, though there is not the space to argue the point in detail, there are good reasons to believe that we understood the basics of climate science well before 1990 (see Spencer Weart's (2004) for the relevant history). Through the work of John Tyndall, Charles Keeling, Gilbert Plass, Roger Revelle, and many others, we experimentally discovered that some gases absorb infrared radiation and re-radiate it toward the Earth, changes in the amount of these gases could warm the planet, and accurate measurements clearly showed the amount of CO_2 increasing in the atmosphere. This scientific basis was secure enough that as historian

Naomi Oreskes noted, in 1965 the Environmental Pollution Board of the President's Science Advisory Committee warned President Lyndon Johnson that we "will modify the heat balance of the atmosphere to such an extent that marked changes in climate . . . could occur" (http://www.washingtonpost.com/wpdyn/content/article/2007/01/31/AR2007013101808.html). In that same year, President Johnson issued a letter to Congress which stated "This generation has altered the composition of the atmosphere on a global scale through . . . a steady increase in carbon dioxide from the burning of fossil fuels" (ibid). Finally, Manzi's contrasts are misleading. Suppose it is true that if the industrialized nations never developed economically, then the median income level of Bangladeshis would be much lower. This does not entail that developed nations did not emitted GHG recklessly (which they have) and that they have allocated the benefits from those emissions justly (which they have not). Nevertheless, let's turn to the other sort of principle since it is often the main focus of current discussions.

A second type of principle are time-slice principles. These principles don't consider past actions and possible restitution or compensation. Rather, given the distribution of some good, it is fair if it is permissible given a correct moral principle of justice independent of how that distribution came about. As a simple example, suppose there is a pie which has six equally sized slices and there are six individuals. It is plausible to suppose that for a good to be fairly shared, each individual is entitled to an equal share of that good. That is, fairness dictates each of us receives a equal per capita share of that good. Peter Singer's and Henry Shue's proposals are each an instance of a equal per capita share proposal with regard to the atmospheric sink. Let's now turn to their specific proposals.

Peter Singer writes, “Why should anyone have a greater claim to part of the global atmospheric sink than any other? No reason at all” (2004, 35). That is, any individual or nation should have a greater than equal share only if they have some moral justification for possessing a greater than equal share. However, there is no such justification since the atmospheric sink is a common resource at best owned by all; it is “self-evidently fair” (ibid, 35). Thus, if the atmosphere can harmlessly absorb say *n* metric tons of carbon and there are *m* individuals, then a fair distribution of carbon emissions is *n/m*. Singer accepts the above principle as a default but does provides several arguments for his “egalitarian” view. First, he argues from his assumed utilitarianism that a per capita equal shares proposal would promote the greatest well-being (or strictly speaking, satisfaction of preferences) when there is great uncertainty (ibid, 41). Second, historical principles such as “polluter pays” would not promote the greatest well-being for reasons we discussed above. Finally, insofar as an alternative like the Rawlsian-inspired view that we ought to aid the worst-off seems correct, it is because of utilitarianism implies that it is correct in specific circumstances (ibid, 42). For example, given the phenomenon of diminishing marginal utility, utilitarianism would imply that we ought to proceed by giving to those who are worst-off more of some resource than those who are better-off since it will improve their well-being even more than the latter. Of course, each of these claims are very controversial. One cannot assume utilitarianism is correct since many ethicists and political philosophers believe that it is not. Similarly, there are pragmatic arguments mentioned for accepting historical principles like the “polluter pays”. Finally, principles involving aid to the worst-off can be understood in terms of diminishing marginal utility; however, diminishing marginal utility can only serve as a justification for aiding the

worst-off when it is reasonable to assume for a given level of a good, each individual will have the same level of preference satisfaction – when there are no "utility monsters".

Nevertheless, whether the above objections can be answered, let's consider Singer's proposal. Clearly, total global emissions are not consistent with the 350 ppm pathway discussed above and so we must reduce our collective emissions to a sustainable level. Likewise, the per capita emissions that are currently occurring are wildly inequitable. Using data from the International Energy Agency, per capita emissions in metric tons of carbon (mtC) in the US, China, and India are 5 mtC, 1 mtC, and 1/3 mtC respectively.[8] So, the average American emits four times more than the average person living in China and sixteen times more than the average Indian. Singer's proposal can be summarized here:

> Sustainable per capita proposal: A fair distribution of global GHG emissions is to allocate the sustainable total emissions on a per capita basis (adjusted for population size).

He suggests that a fair approach would be to reduce our per capita emissions globally to one metric ton per person per year (though this figure is out of date) (ibid, 35).

There are two common objections to Singer's proposal which he himself notes. First, when viewed from a national perspective, if a country has a larger population size, then they are entitled to a larger share of total emissions. Thus, in order to increase one's atmospheric entitlement, a nation could simply increase its population size. To avoid this conclusion, Singer

[8] In *One World*, Singer claims that in the United States, China, and India the per person per year metric tons of C emissions respectively are 5 metric tons, 0.76 metric tons, and 0.29. These numbers are older and new calculations based on 2007 data are as follows. The IEA records per capita emissions in terms of CO_2 which is heavier than C. Thus, we can use the following equality, $5tC = 19tCO_2$, to determine how much carbon is emitted per capita. In the US, China, and India the respective per capita CO_2 emissions are is 19.1, 4.6, and 1.2 and thus the respective per capita C emissions are 5.026, 1.21, and 0.315. Thanks to Paul Baer and Stephen Gardiner for discussion of these issues.

suggests the following:

> I propose, both because of its simplicity, and hence its suitability as a political compromise, and because it seems likely to increase global welfare, that we support the second principle, that of equal per capita future entitlements to a share of the capacity of the atmospheric sink, tied to the current United Nations projection of population growth per country in 2050. (ibid, 36)

The second objection is this.

> The real objection to allocating the atmosphere's capacity to absorb greenhouse gases to nations on the basis of equal per capita shares is that it would be tremendously dislocating for the industrialized nations to reduce their emissions so much that, within 5, 10, 15 years, they were not producing more than their share, on a per capita basis, of some acceptable level of greenhouse gases. (ibid, 45)

In order to deal with this problem, Singer suggest that a cap-and-trade program be adopted. There should be a set of allocated emission permits such that if a countries emissions are above their per capita share then they must purchase credits from those whose per capita emissions are below their total per capita shares. Over time, emissions from different countries will converge as credits are reduced through time and this also has the advantage of allowing developing nations to utilize these funds to increase their own development in a sustainable manner.[9] Let us now turn to Henry Shue's proposal.

Shue notes that global climate change can result it two sorts of harms (2001, 449 – 451). First, moral agents *cause* changes in weather which lead to negative impacts on well-being (i.e., water resources, infectious disease, etc.) and if a moral agent causes a harm, then they are morally responsible for that harm. Second, moral agents *prevent* people from obtaining the

[9] Of course, as we are seeing in the United States, it is very difficult to accomplish a cap-and-trade system in one country much less a global emissions trading scheme.

necessary minimum of a resource vital for their survival. Each human needs a minimum amount of the planet's "atmospheric sink" to survive (i.e., raising livestock, transportation, etc.).[10] For example, more than one billion people have poor access to fresh water, approximately 800 million are chronically undernourished, and two million children die per year from diarrhea. Concerning this latter sort of harm Shue writes,

> Our unnecessary emissions are blocking their vital ones, except at the price of speeded up climate change, which will be most unmanageable for them. We are depriving them of a necessity for their survival, given the fossil fuel regime, which the poor, unlike the affluent, cannot change… The energy regime that makes life opulent for Belgians and Saudis makes it impossible for Rwandans and Haitians, who are helpless victims of a complex global social institution in which they have absolutely no voice. (ibid, 452)

The only morally permissible allocation of emissions is one that guarantees the availability of the minimum necessary emissions to every person.

> Subsistence per capita proposal: A fair distribution of global GHG emissions is to allocate total emissions on a subsistence per capita basis.

That is, each person should receive at least the amount of GHG emissions that are required for their survival and the excess above this can be divided equitably and managed through a cap-and-trade scheme.

As we have seen, the United States per capita emissions are far greater than that of developing nations such as China and India and the atmospheric sink is limited in its absorptive capacity consistent with our living well. Shue thus would argue in the following manner. Every person is entitled to their fair share of emissions and many are below their fair share not due to

[10] I am suspicious that these harms are distinct. That is, both causal chains involve an increase in emissions which leads to some changes in weather or climate which leads to some decrease in well-being. However, in the later sort of Shue-harm, there is a decrease which leads to death of an individual. Thus, the second type of harm is indentified in virtue of nature or size of its effects.

their own choice. If every person is entitled to their fair share of emissions and some are below their fair share not due to their own choice, then those who are above their fair share should reduce their emissions. Hence, those who are above their fair share should reduce their emissions. Industrialized nations are above their fair share. Therefore, they should make reductions – and in fact the highest reductions.

Recently, Baer, Anthanasiou, Kartha, and Kemp-Benedict (2008) have articulated a *greenhouse development rights* approach which is a instance of the more general subsistence proposal. This approach defines national obligations with regard to a *development threshold* where individuals with incomes and emissions below that threshold are allowed to invest that money in development. This operationalizes subsistence rights. However, for those individuals with incomes and emissions above the threshold be they in the developed or developing countries, they are morally obliged to pay for the costs of a climate stabilization program.

To more exact, Baer et. al. suggest that the development threshold should be at 25% above the global poverty line which is considered to be $16 a day. Thus, the threshold is $20 per day or $7500 per year adjusted for purchasing-power-parity (PPP). We can then define a nation's obligatory share of the global mitigation and adaptation costs based on their capacity and responsibility. A nation's *capacity* to pay is that amount above the threshold level and their *responsibility* is their contribution to the atmospheric sink (from say 1990 on) excluding subsistence emissions corresponding to consumption below the threshold. This approach then attempts to articulate what was written in the United Nations Framework Convention on Climate Change.

> Acknowledging the global nature of climate change calls for the widest possible cooperation by all countries and their participation in an effective and appropriate international response, in accordance with their common but differentiated responsibilities and respective capabilities. (http://unfccc.int/essential_background/convention/background/items/1350.php)

The responsibility and capacities of nations can be quantified using empirical data and we can thus determine how to fund emissions reductions while yet taking poorer individual's right to develop or right to subsist seriously.

Of course, not everyone will be convinced of subsistence proposals. First, one might deny that there are "basic subsistence rights" because either there are either no rights or because these specific rights do not exist. For example, libertarians are skeptical of economic rights and some utilitarians are suspicious of rights since they appear to be inherently deontological notions. Second, one might deny that there is some objective measure of basic subsistence with regard to GHG emissions (a point to which we will return below). Nevertheless, I now want to turn to issue of conflict. Ideally, these two proposals would not conflict; however, there are circumstances in which they as stated would.

Conflict of Proposals

In order to understand the possible conflict between Singer's and Shue's respective proposals, we need to consider three "numbers". I will hereafter discuss Singer's proposal as the *sustainable proposal* and Shue's as the *subsistence proposal*. Here are the relevant quantities.

- The *sustainable* maximum total = per capita maximum which does not produce dangerous climate change (i.e., emissions under 350 ppm)
- The *subsistence* minimum total = per capita subsistence minimum × the global population
- The *actual* total of current emissions

In the best case scenario, we should find the following relationship:

Sustainable maximum total > actual total of emissions > subsistence minimum total

In the second best scenario, we should find the following relationship:

Actual total of emissions > sustainable maximum total > subsistence minimum total

However, in the worst case scenario, we have:

Actual total of emissions > subsistence minimum total > sustainable maximum total

The rationale for the ordering above is as follows. In the best case scenario, the sustainable amount of emissions is greater than our global total and thus we avoid the worst effects of global climate change. Moreover, our total emissions ensures each person can meet the subsistence needs all things being equal.[11] In the second best case, our actual emissions must be reduced to avoid the worst effects of global climate change but fortunately after the reduction individuals can still meet their basic subsistence needs. Finally the worst case scenario insures that we must reduce our emissions but to meet our sustainable maximum we can do so only at the cost of some individuals not meeting there subsistence needs.

To see this more concretely, let's put some "fill in" the analysis. According to the IPCC, if we are to reduce our emissions and hold average surface temperatures to 2°C, the amount of sustainable emissions in 2050 will be 2 GtC and the United Nations projects 8 (low), 9 (medium), or 10 (high) billion people in 2050. Thus, we have the following sustainable per capita emissions adjusted by global population: 8 billion (0.25 mtC/yr), 9 billion (0.22 mtC/yr),

[11] By "all things being equal" I specifically meant that there are not additional issues of unfair distribution with regard to those emissions.

and 14 billion (0.2 mtC/yr).[12] Remember, the per capita emissions from China is 1 mtC/yr and from India is 1/3 mtC/yr. Thus, in order to have sustainable emissions levels given IPCC projections, the average global citizen will be *exceptionally poor*. We have reason to believe that in 2050 we will be in the worst case scenario if we continue as we are. If the above analysis is correct, or even if it is approximately correct, then we must find some equitable way to deal with the distribution of burdens and benefits bequeathed to those in 2050 and 2100. How do we make fair or just choices regard our emissions reductions?[13] As should be apparent, when the sustainable maximum is less than the subsistence minimum, Singer's and Shue's proposals as stated will conflict. Singer would have us reduce our global emissions until we meet the 350ppm pathway while Shue would have us stop short to ensure that each individual's basic needs are met. However, the latter if followed will not prevent the worst impacts of climate change while the former will leave many people barely able to survive if at all though avoiding the worst impacts of climate change. How should we choose then between these two proposals?

Reconciliation

In this section, I argue that the two proposals when carefully and plausibly articulated are much more similar than they seem at first. Hence, the acceptance of either will lead to similar conclusions.

[12] In 2010, the UN projects a low estimate of 5 billion, medium estimate of 9 billion, and a high estimate of 14 billion people. With these numbers and the same emissions target 2 GtC, we have 0.4 ton/yr, 0.22 ton/yr, and 0.14 ton/yr.

[13] One might argue that consumption levels and population are both morally salient variables. I agree. However, for the purposes of this paper I am ignoring them. One might argue that green technologies can raise subsistence levels with low emissions. Likewise, one might argue that global population should be reduced by quite a bit.

First, utilitarians – or, more exactly, consequentialists – like Singer suggest that an action, relative to a set of available alternatives, is morally right when it has the greatest expected consequences in terms of well-being.[14] He proposes the equal per capita rule with the following justification.

> I propose, both because of its simplicity, and hence its suitability as a political compromise, and because it seems likely to increase global welfare, that we support the second principle, that of equal per capita future entitlements to a share of the capacity of the atmospheric sink, tied to the current United Nations projection of population growth per country in 2050. (2004, 43)

However, Singer himself implicitly realizes that this rule need not produce the greatest expected consequences when he writes,

> One of the 1.2 billion people in the world living on $1 per day will get much more utility out of an additional $100 than will someone living on $60,000 per year. Similarly, if we have to take $100 from someone, we will cause much less suffering if we take it from the person earning $60,000 than if we take it from the person earning $365 a year. (ibid, 42)

Of course, here we are not considering money per se but the allocation of GHG emissions, but it is just as plausible to suppose diminishing marginal utility applies to GHG emissions as it does to money. A gain of *x* emissions will improve the of poor's well-being much more than the loss of *x* emissions will reduce the rich's well-being. Given the poverty under consideration and the disparity in emissions, it would be more like to produce better consequences for well-being to give priority to the least well-off until a equitable distribution of emissions is achieved subject to a sustainable maximum total avoiding dangerous climate change. As an approximation then,

[14] Utilitarianism is a species of consequentialism where the latter is the view that actions, rules, motives, and character traits are to be directly or indirectly evaluated in terms of the consequences for well-being and the utilitarians claim well-being is to be understood in terms of pleasure and pain. Consequentialism is a house with many rooms; for example, some forms of virtue theory are instances of consequentialist views.

the equal per capita rule would produce the most well-being when and only when well-being was equitably distributed. Thus, a utilitarian should agree with Shue that the worst off should be given priority regarding GHG emissions.

Second, the disparity between the sustainable maximum and the subsistence minimum will become larger as we do nothing and continue with business as usual. As we continue to emit GHG unabated, our descendants will have to reduce their per capita emissions even more than us now. Moreover, as we do less and less, the effects of anthropogenic climate change will become worse and worse. Consider the following projected changes resulting from increases in average surface temperature (Lynas 2008). If temperatures increase by approximately 2.4°C, then coral reefs will almost be extinct, there will be new dust bowl conditions in the high plain states in North America, the Greenland ice sheet will irreversibly melt, and approximately a third of species will face extinction. If temperatures increase by approximately 3.8°C, then the Amazonian rainforest will largely have been destroyed through fire, the interior of Brazil will be desert, the Arctic ice cap will disappear during the summer months, and the snowpack in the Sierra Nevada will be gone leaving water shortages throughout California. If temperatures increase by approximately 5.4°C, then the West Antarctic ice sheet will break apart adding five meters to global sea levels (and possibly ensuring the planet is ice free), glaciers will no longer be present in the Himalayas, monsoons will threaten millions in India and Bangladesh, and tens of millions of refugees search for safe havens from extreme weather and try to find food. Finally, if temperatures increase by approximately 6.4°C, then warming seas will release methane hydrates trapped in sediments which causes further warming, oceans will lose their oxygen and will not support life as we know it, deserts will extend to the Arctic, and

"hypercanes" travel the globe with humanity being reduced to a relatively small number of survivors.

I contend that Singer's and Shue's is a species of a familiar conflict – one between deontology and consequentialism. Specifically, Shue defends the notion of subsistence rights which serve as constraint on promoting well-being. A constraint is a prohibition against an act even when it would be more likely to produce better consequences than the available alternatives (Shue 1996, Kagan 1989, Nozick 1974). Singer and other consequentialists argue that there are no such constraints. Or, put differently, consequentialists see these constraints *teleologically.* All things being equal, if violating the subsistence rights of one person is a loss, then the violation of the subsistence rights of two or more people is even worse. In effect, teleologically understood, this is precisely what Shue's proposal would recommend.

Of course, Shue very well might reject this teleological reading of subsistence rights. In fact, he might suggest that they provide an absolute prohibition. Strictly speaking, if there are *m* people, then any allocation which does not meet the subsistence needs of those *m* people is morally wrong. Moreover, consider two states of affairs – A) a state of affairs where *n* people's subsistence rights are not met and B) a state of affairs where *m* people subsistence rights are not met and where $n >> m$. On this reading, Shue's proposal would say they are equally bad even though many more people's rights are violated in A) than in B). As global emissions increase in a business as usual manner, the sacrifices that must be made will look just like this

and I would suggest that most of us would only accept Shue's proposal teleologically understood.[15]

Third, it is clear that our subsistence is vague and variable . It is vague since one can subsist over a wide amount of goods such as food, water, clean air, etc. It is variable because we differ over what amount of any good on which we can subsist. Thus, only in the case of extremes will one not be able to subsist whatsoever. Another way of seeing this point is that subsistence is usually not construed as a purely biological notion but also as an evaluative one as well. Baer et. al. (2008) allocated their development threshold above the poverty line for moral reasons but clearly individuals can survive below it.

When we combine each of these points of refinement we can see that Singer's and Shue's proposals would exhibit much more similarity than we first thought. First, both proposals recommend that we give priority to the worst off. Second, both proposals recommend we give priority to those whose collective subsistence is most greatly threatened. Third, both recognize that the subsistence of people is vague and variable – well-being is not a "sharply edged" thing. The main difference between the two proposals properly articulated is the emphasis placed on subsistence rights and whether this is a substantive difference remains to be seen.

Conclusion

[15] One might respond to this argument by claiming that there is some *threshold* such that the two states of affairs are the same morally until that threshold is reached. For example, A) and B) differ morally only when $n >> m$ otherwise they are equally bad. However, one must supply a *reason* for suggesting the threshold is at n as opposed to $n - 1$ or $n + 1$. If given more space, I would argue that no non-arbitrary reason can be given for n as opposed to $n - 1$ or $n + 1$.

In this essay, I have discussed two proposals concerning equity and climate change – the "sustainable per capita" and the"subsistence per capita" approaches from Peter Singer and Henry Shue respectively. Likewise, I have considered circumstances in which those proposals conflict; namely when the subsistence minimum is greater than the sustainable maximum. Likewise, I have argued that the proposals when properly refined and articulated would recommend very similar courses of action.

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