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Qui bono? Justice in the Distribution of the Benefits and Burdens of Avoided Deforestation

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Abstract In this paper, I explore the question of how the costs of undertaking an important type of climate change mitigation should be shared amongst states seeking an environmentally effective and equitable response to global climate change. While much of the normative literature on climate mitigation has focused on burden sharing within the context of reductions in emissions of greenhouse gas, I explore the question of how the costs of protecting tropical forests in order to harness their climate mitigation potential should be distributed amongst developing and developed states. In response to this question, I outline and defend a ‘beneficiary pays’ account of forestry mitigation burden sharing that requires affluent states to finance measures supporting avoided deforestation while less affluent states, within whose territory these forests tend to be located, implement these measures. The normative basis for this account, I argue, is a principle of ‘unjust enrichment’ according to which developed states must bear much of the cost of avoided deforestation for its climate mitigation potential because of the huge economic benefits their citizens have accumulated from productive activities that have contributed to climate change.

Keywords Climate justice · Global justice · Free riding · Beneficiary-pays principle · Unjust enrichment · Fair reciprocity

Introduction

Global climate change poses a severe threat to the welfare and security of present and future generations. Increases in global temperature and sea-level, and changes in the frequency or intensity of extreme weather events, will amplify existing global

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inequalities given that the populations most vulnerable to these changes will be those residing in developing states (IPCC 2014, p. 69). In response to such threats, the governments of over 190 states are now committed to adopting a mix of policies with the objective of ‘avoiding a dangerous anthropogenic interference with the climate system’ (UNFCCC 1992, p. 9; IPCC 2014, p. 84). These policies can be usefully separated into ‘mitigation’ (to limit the extent of climate change by controlling sources, and enhancing withdrawals, of the gases that cause climate change), ‘adaptation’ (to adjust human behaviour in order to reduce the disruptive effects of actual or expected climate change), and ‘loss and damage’ (to compensate vulnerable populations that endure adverse effects of climate change that cannot, or will not, be prevented through policies of mitigation or adaption). Although policies of adaptation and loss and damage have become an increasing focus of normative analysis, climate change mitigation remains a pre-eminent concern of climate justice theorists (Caney 2012, 2014; Blomfield 2013, 2016; Armstrong 2015).

In this paper, I address the challenge of determining how the financial and managerial burdens associated with undertaking a crucial form of mitigation should be shared amongst states committed to a global response to climate change. While much of the normative literature on climate mitigation has focused on how the burdens associated with reducing fossil fuel emissions should be distributed internationally, I explore here the question of how the costs of preserving and enhancing naturally occurring processes that withdraw greenhouse gases from the atmosphere should be distributed. I do this by exploring a novel approach to climate change mitigation requiring affluent states to *finance* measures designed to exploit the mitigation potential of tropical forests whilst poorer states, whose territory these forests occupy, *implement* these measures on a day-to-day basis. The normative basis for this approach to mitigation burden-sharing, I argue, is a ‘beneficiary pays’ principle of climate change justice according to which developed states should bear the financial costs of tropical forest-based mitigation policies implemented within the developing world to reflect the huge amount of benefit that agents operating within their territories have accumulated from productive activities since the beginning of the industrial revolution that are now known to cause climate change.

In the next section, I briefly outline the science of forest-based mitigation and the normative puzzle it poses for climate justice theorists in terms of fair burden sharing amongst rich and poor states. I then go on to explore how a ‘beneficiary pays’ account of climatic burden sharing might be used to solve this puzzle by, firstly, comparing it to two rival burden sharing accounts and, secondly, by exploring two versions of the account (the ‘policy beneficiary’ and ‘unjust enrichment’ accounts). I go on to argue that the ‘unjust enrichment’ account is superior to the ‘policy beneficiary’ account in the way it resolves the problem of burden sharing raised by forest-based mitigation and also that thinking of burden sharing in terms of unjust enrichment has advantages over rival perspectives such as ‘ability to pay’ or ‘contribution to problem.’ The penultimate section briefly responds to three objections to the ‘unjust enrichment’ account and a final section provides a brief summary of the paper.

Reducing Emissions from Deforestation and Degradation

The Earth's forests play a key role in the global policy response to climate change due to the critical role they play in the process through which accumulations of greenhouse gas are stored in the Earth's atmosphere (Pan et al. 2011, p. 992). The climate mitigation potential of forests is based on two pathways: the enhancement of greenhouse gas removals and the reduction of greenhouse gas emissions (Smith 2014, p. 816). In terms of *emissions reductions*, land use changes in global forests (primarily through forest clearing for agriculture, pasture and timber production) are a major component of these emissions (Pan et al. 2011, p. 991). Forests also release carbon into the atmosphere through natural processes of tree respiration, decomposition, and forest fires—and these natural processes are all influenced by human practices such as the conversion of forests into agricultural land, logging, and expansion of settlements (Nabuurs and Masera 2007, pp. 544–545). It has been estimated that forest-based emissions account for between 12 and 20 per cent of all global anthropogenic greenhouse gas emissions and, as a result, it is widely acknowledged that emissions from forestry must be reduced significantly if 'dangerous anthropogenic interference' is to be avoided (Van Der Werf et al. 2009, pp. 737–738). In terms of *enhancing removals*, the Earth's forests store huge amounts of carbon as a result of processes of photosynthesis that transform carbon dioxide in the atmosphere into biomass (UN-FAO 2010, p. xvii; Nabuurs and Masera 2007, pp. 564–566). Forests also store substantial amount of carbon in soil, dead wood and litter (Pan et al. 2011, p. 989). Forests, in removing significant amounts of greenhouse gas from the atmosphere, provide a unique 'ecosystem service' in the way they constrain processes of climate change when managed effectively (Nabuurs and Masera 2007, pp. 564–566). As much as 15 per cent of global annual emissions of carbon dioxide, for example, could be sequestered by forests through preserving existing forest cover (Pan et al. 2011, p. 992). *Tropical forests*, in accounting for roughly 70 per cent of carbon sequestered each year by the Earth's forest cover, have a particularly important role to play in climate mitigation policy (UN-FAO 2012, p. 14).

Policies designed to reduce forestry emissions, and enhance the carbon sequestration function of tropical forests, will involve significant costs accruing to those agents who undertake and finance these policies. Without international intervention, much of this cost will fall on the developing world since a substantial proportion of the remaining forest cover is located within low-income states that depend on forests for their economic development. Tropical forests located in developing states in South America and Africa, for example, accounted for over half of the total amount of carbon stored in the world's forests in 2010 (UN-FAO 2010, p. xvii). This special geopolitical feature of forestry-based mitigation raises a significant puzzle of climate burden sharing since forest-based mitigation will require significant investments within developing states (in institutional capacity, capital investment, and development of new forestry technology) whereas the benefits of exploiting the mitigation potential of tropical forests will be shared by all states.

The normative questions raised by policies to exploit the mitigation potential of tropical forests, though distinctive, otherwise mirror quite closely the general features of established climate burden sharing debates in that we can ask *which agents* should bear *what types of burden* if the burdens arising from implementation of these policies are to be justified. The burdens at the centre of the tropical forest mitigation problem, which for simplicity I will refer to as costs of ‘avoided deforestation’, are a mixture of direct and indirect costs accruing both locally and internationally (Smith 2014, p. 864; Armstrong 2015, p. 2). *Direct costs* include the costs of implementing policies that increase forest area, reduce deforestation, and maintain existing forests. They also include the costs associated with developing and implementing new forestry protection mechanisms at the international level, such as the United Nations REDD + initiative (Smith 2014, p. 864). *Indirect costs*, meanwhile, extend to the ‘opportunity costs’ of avoided deforestation such as forgone development opportunities of developing states that sacrifice economically productive activities that would otherwise impair avoided deforestation policy (UN-FAO 2012, p. 14).

The Beneficiary Pays Principle of Burden Sharing

Who should bear the predictable direct and indirect costs of exploiting the climate change mitigation potential of avoided deforestation? If we reject the idea that duties to manage tropical forests to exploit their climate mitigation potential fall exclusively upon the states where these forests are located, the literature supplies three alternative burden sharing principles that could solve this problem (Caney 2010; Page 2011). Here I interpret each as an account of the duties that states, rather than the agents that operate within their borders, owe to each other in respect of climate change mitigation burden sharing.

According to the ‘beneficiary pays principle’ (BPP), states that predictably benefit from policies designed to reduce the risk of ‘dangerous anthropogenic interference’, or from activities that created the environmental damage changes that these policies are now designed to address, should shoulder the principal burdens of financing, and where possible undertaking, mitigation policies. Each state, that is, should contribute to the mitigation effort in rough proportion to how much it has benefited, or will benefit, from the activities that caused climate change or policies that address climate change. The unfairness of existing arrangements concerning mitigation and avoided deforestation, on this view, is that developing states are forced to bear much of the cost of these policies while developed enjoy the fruits of the associated climate mitigation on top of the benefits they continue to enjoy that are associated with productive activities responsible for driving climate change.

According to the ‘contributor pays principle’ (CPP), states should bear the costs of managing climate change and its adverse effects in proportion to how much they contributed to the emergence of the climate problem as measured by the cumulative greenhouse gas emissions of each. The unfairness of present arrangements, on this view, is that developing states, due to the disproportionately high tropical forest cover located within their territories, bear the heavy burden of executing avoided

deforestation policies while developed states, on average, bear a far greater responsibility for climate change due to their greater share of cumulative greenhouse gas emissions released into the atmosphere since the beginning of the industrial revolution. The developed states should, therefore, take the lead in paying for policies of avoided deforestation to reflect the fact that they took the lead in releasing the greenhouse gas emissions that triggered the climate threat and therefore the need for such policies to be adopted.

According to the ‘ability to pay principle’ (APP), the costs of mitigating climate change should be borne in proportion to the capacity of each state to bear these burdens as measured by national income, national wealth, institutional capacity, mitigation capacity, or some combination of these metrics. The unfairness of present arrangements, on this view, is that developing states bear much of the cost of avoided deforestation policies while the institutional and financial capacity to sponsor these policies effectively, and without serious hardship arising within the sponsoring states, is disproportionately located in the developed world.

The strengths and weaknesses of the BPP, CPP and APP as principles of fair burden sharing have been well covered in the literature (Caney 2010; Meyer and Roser 2010; Page 2011). The APP and CPP continue to dominate the theoretical and policy debate, particularly where the focus of the analysis is the duty of each state to mitigate climate change through reductions in their annual greenhouse gas emissions (Caney 2012, 2014). By contrast, my aim here is to explore how the BPP may also offer a distinctive and persuasive justification for adopting policies that enhance greenhouse gas withdrawals by separating the duty to finance measures of avoided deforestation undertaken within developing states from the duty to take operational responsibility for the implementation of these measures.

The BPP, as we shall see, can be developed either as an account of duties of agents who have benefited from the productive activities that cause climate change (the ‘unjust enrichment’ BPP) or as an account of the duties of agents who will predictably benefit from policies that aim to prevent climate change (the ‘policy beneficiary’ BPP). Both accounts seek to explain why developed states should pay developing states to protect the tropical forests under their control from deforestation. Where the accounts differ is the way they approach the question of which *benefits* lie at the heart of the duty of developed states to surrender (or ‘disgorge’) some of their current wealth to finance policies of avoided deforestation and which *agents* enjoy, or will come to enjoy, these benefits. In what follows, I argue that the BPP should be interpreted in terms of ‘unjust enrichment’ rather than ‘policy benefits’ and also argue that understanding the BPP in terms of unjust enrichment helps clarify certain advantages that the BPP has, in theoretical and practical terms, over the APP and CPP.

Benefiting from Policies of Avoidable Deforestation: The ‘Policy Beneficiary’ BPP

The climate change mitigation benefits of avoided deforestation will be unevenly spread across states. All states will benefit to some extent, but some will gain more than others in terms of reductions in economic disruption, morbidity and mortality

relative to what they would have been had no climate mitigation response been adopted. Although developing states, such as those home to large tropical forests, will benefit from a weakening in all of the these pathways of climatic disruption, developed states will also benefit greatly from reduced disruption to assets located inside their territories. Due to geographical location, however, as well as historical deforestation in developed states, a large proportion of the Earth's remaining tropical forests is located within the territories of developing states who cannot afford to bear the burden of protecting these forests without sacrificing significant development opportunities (Pan et al. 2011, p. 990). The mitigation benefits of avoided deforestation, and the costs of undertaking avoided deforestation, are thus out of alignment and this misalignment will continue in absence of a mechanism that adjust the burdens of each state. According to the 'policy beneficiary' BPP, the justification for such a mechanism is that the costs of enhancing withdrawals of greenhouse gas through avoided deforestation should be shared amongst states according to the extent that each is expected to benefit from these measures. Given that the developed states have much to gain from (and the developing states currently face disproportionate costs in implementing) measures of avoided deforestation, the former should bear a much greater share of the financial cost than they do currently if relations between these states is to be fair.

The 'policy beneficiary' BPP is essentially a global application of the principle of 'fair reciprocity' (Page 2007, pp. 227–228; Armstrong 2015, p. 4). According to this principle, no agent can reasonably refuse to pay their fair share of the costs of realizing a policy goal, or endeavor, that they and other agents have freely endorsed so long as (1) other agents pay their fair share (or more than their fair share) and (2) each agent continues to benefit, and other agents can reasonably assume that they continue to benefit, from the realization of the policy goal or endeavor. The burdens associated with undertaking measures of avoided deforestation, here, should be shared out amongst states fairly and the extent to which each state is expected to benefit from these measures is a key indicator, if not the only indicator, of how much they should be prepared to pay. The basis of the duty to act is the connection between the mitigation benefits delivered by avoided deforestation and the burdens that these policies impose on those states that finance, and implement, these policies. If, as in the case of the United Nations Framework Convention on Climate Change, (UNFCCC 1992), a number of agents have come together and declared that they wish to contribute to a mutually valued cooperative venture then it would be unfair for one or more of their number not to bear a fair share of the cost of pursuing this venture while simultaneously benefiting from their international partners paying their fair share. The geographical location of tropical forests is not, on this view, a normatively relevant factor in the way that fair shares of costs of avoided deforestation are distributed since duties are allocated by the 'policy beneficiary' BPP on the basis of benefits predictably received, and presumptively welcomed, rather than on the location of the benefit producing practice.

The 'policy beneficiary' BPP has been endorsed recently by Chris Armstrong. Armstrong argues that agents that predictably benefit from the avoided deforestation efforts of developing states should bear much more of the financial burden of undertaking these efforts than they do at present (Armstrong 2015, pp. 6–10). Such

efforts, he argues, provide a valuable ‘ecosystem service’ of enhanced climate mitigation that all states have reason to value and from which no state can be excluded. Consequently, following the logic of the theory of public goods, any state that fails to contribute its fair share to avoided would be impermissibly taking a ‘free ride’ on all other states that accept these costs (Armstrong 2015, p. 4). The agents at the centre of Armstrong’s fairness-based approach to forestry mitigation are developing world ‘producers’, and developed world ‘non-producing recipients’, of benefits arising from avoided deforestation. The producers, as noted above, are states such as Ecuador that face a unique dilemma where their international commitments to tackle climate change impose costly burdens of avoided deforestation that conflict with their domestic commitments to tackle poverty amongst their citizens through productive processes that increase deforestation. The beneficiaries are states, such as the United Kingdom, that enjoy a ‘free ride’ on the benefits created by Ecuador’s avoided deforestation policy by refusing to pay their fair share of the production costs of these benefits while their citizens continue to profit from greenhouse gas emitting activities that make this novel form of climate change mitigation necessary (Armstrong 2015, pp. 6–7).

In the useful terminology introduced by Gosseries (2004, pp. 43–46), the free riding that Armstrong describes can be seen as ‘parasitic’ (harmful) rather than ‘benign’ (non-harmful) and is therefore doubly impermissible under the fair reciprocity principle. Developing states, burdened by fortuitous location of tropical forests within their borders, invest in avoided deforestation rather than economic development with the side-effect being that their populations continue to suffer from the global inequalities in wealth and power that can be traced to climate change producing activities in the past. As Armstrong (2015, p. 6) puts it, ‘[developed states] avoid sharing in the costs of provision [while exploiting] the difficulties of enforcing payment and thereby oblige others, inappropriately, to subsidise [their] own ends.’ Fulfilling the relevant duties, by contrast, would involve beneficiaries of measures to avoid deforestation ‘paying their fair share’ of the cost of the valuable eco-system service they predictably receive from avoided deforestation while providing direct financing for avoided deforestation measures in states such as Ecuador that request such financing. Alternatively, developed states might instead invest in other forms of climate mitigation that have an equivalent effect in terms of slowing, or reducing the magnitude, of climate change so that they would not be ‘free riding’ on developing states when they decline to invest directly in avoided deforestation measures. Engaging in such ‘mitigation offsetting’ would close the gap between how much a developed state benefits from, and how much it contributes to, the global climate mitigation response *as a whole* (Armstrong 2015, pp. 12–13).

On first inspection, Armstrong’s account offers a strong justification of international policies of avoided deforestation currently under development within the UNFCCC system that seek to close the gap between the avoided deforestation policy burdens of developed and developing states. Nevertheless, significant problems arise with the underlying idea that we can solve the avoided deforestation puzzle merely by requiring states to cover the costs of these policies in proportion to the benefits their populations predictably enjoy from their implementation. First, the

‘policy beneficiary’ approach seems too charitable to states that, for reasons of historical or geographical contingency, are less vulnerable to climate change and hence have less to gain from policies of avoided deforestation. Such states might conceivably enjoy higher levels of development than neighbouring states due to the accumulation of the benefits of carbon based industrialization while also avoiding many of the risks of climate change. It seems unfair to require a lesser sacrifice from such states if they have high mitigation potential, as measured by current income or wealth, particularly if they bear significant historical responsibility for climate change as measured by their historical greenhouse emissions records.

Second, emphasizing the importance of restoring fairness amongst ‘producers’ and ‘recipients’ of policies that reduce the risk of dangerous anthropogenic interference can easily lead to us ignoring a far greater injustice. This is that the citizens of some states continue to enjoy huge benefits as a result of enjoying a privileged position within an international system characterized by inequalities in wealth, status, income and power—while others living in less privileged states experience the negative consequences of these structural inequalities—that could not have arose in absence of the activities responsible for driving climate change. Acknowledging, and tackling, such inequalities requires an account of climatic justice that seeks not merely fairness amongst future beneficiaries of climate change policy but also to understand the injustice of existing institutional forms.¹

Third, Armstrong’s focus on rainforest protection benefits ignores an important stream of economic benefits that is even more closely connected to international injustice at the heart of the climate change problem and the need to exploit forests for their climate mitigation potential, namely, the benefits that arose from the practices that drive climate change. Human activities have released in excess of one trillion tonnes of carbon dioxide equivalent since 1750 (Boden et al. 2015). In the same period, global wealth has grown to over 700 trillion dollars, with over 80 per cent of this wealth now being in the hands of agents located in developed states (World Bank 2011, pp. 182–183). Whilst the relationship between past greenhouse gas emissions and present global wealth distribution is complex, it is clear that much of current world wealth would not exist ‘but for’ the climate changing activities that have underpinned international trade and growth since the beginning of the industrial revolution. To deliver a comprehensive account of fairness in the distribution of burdens of avoided deforestation, then, Armstrong’s account of burden sharing must embrace this broader range of climatic benefits. Not to do so would prioritize one sort of unfairness (unfairness amongst present and future beneficiaries of climate policy) over another (unfairness amongst beneficiaries and non-beneficiaries of productive activities that change the climate system) without argument. However, it is far from clear how Armstrong’s account could be broadened in this way without compromising its distinctiveness as a wholly ‘forward looking’ account of burden sharing.

¹ For further elaboration of the claim that citizens of developed states currently enjoy the benefit of an advantageous position within an unfair global distribution of wealth and power that owes its existence to the over-exploitation of the capacity of the atmosphere to absorb greenhouse gas, see Blomfield (2016) in this issue.

Benefiting from the Causes of the Climate Change Problem: The 'Unjust Enrichment' BPP

According to the 'unjust enrichment' BPP, developed states have a peculiarly strong responsibility to finance measures of avoided deforestation because much of the present income and wealth of their citizens can be traced back to activities in the past that are still contributing to climate change. The duty of each state to surrender *a certain amount* of the benefit under its control to finance avoided deforestation measures flows from the impermissibility, in the present, of any agent retaining all of the benefits it commands when at least some of these benefits can be traced back to activities that impose unjustified burdens on other agents (Meyer and Roser 2010, pp. 252–253; Page 2012, pp. 313–317; Butt 2009, p. 123).

The core argument proceeds as follows. The economic and social benefits that have arisen as a result of activities that released vast amounts of greenhouse gas into the atmosphere since the beginning of the industrial revolution have been spread unevenly across states in both aggregate and per capita terms. These benefits can be seen in the uneven global pattern of national wealth and income, as well as in inequalities in a range of individual-level indicators of human development and well-being. All states command benefits that can be linked in a morally relevant way to the causes of climate change but developed states command a far greater proportion of the wealth that is 'tainted' by the shadow of climate change than developing states. A duty of justice requiring each state not to profit from human activities that impose unjustified suffering on other agents means that each state should be prepared to surrender (or 'disgorge') a certain amount of its wealth that can be traced back to the anthropogenic processes that drive climate change in order to mitigate the threat of climate change. Such disgorgements can be required until the risk of dangerous anthropogenic interference has abated or the benefits traceable to activities that drive climate change are exhausted. The refusal to disgorge in this fashion would be to violate a duty not to benefit from the undeserved suffering of others without contributing to the ending of this suffering. Implementing avoided deforestation measures in the developing world, as we have seen, is a vital part of the global climate mitigation response since it tackles the causes, and not merely the effects, of climate change and so it is *one* of a number of key endeavors that should receive support through this channel of funding.

For the 'unjust enrichment' BPP, the focus of the duty to pay for avoided deforestation is not on historical wrongdoing but on presently held benefits that should have been shared with others more fairly if they should have been created at all. As Klimchuk (2004), p. 1274 explains, 'one can understand the unjust enrichment claim as reaching no further than the impermissibility in the present of the past justification for the impugned transfer.' Unjust enrichments, although they always follow some deviation from a just arrangement of resources, neither require that we retroactively blame past generations for harms they had absolutely no way of predicting nor identify specific past *wrongdoers*, or *wrongdoing*, in the standard sense. It is merely unfair, and unjust, that the costs of avoided deforestation policies accrue wholly to impoverished states when so much economic benefit exists in other

states that can be traced back to the activities that generated the need for such policies.

There are several reasons for thinking that the ‘unjust enrichment’ BPP is a more attractive interpretation of the BPP than its rivals while also retaining some general features of BPP reasoning that finesse some disadvantages with the CPP and APP. First, the ‘unjust enrichment’ BPP identifies a potentially extensive revenue stream for the funding of avoided deforestation without implying that all present-day benefits should be surrendered for this purpose and without reducing mitigation burden sharing to one of fairness amongst beneficiaries of mitigation policy. Second, the ‘unjust enrichment’ BPP coheres with the intuition that injustice arose in the creation of the climate change problem but in a way that does involve blaming the inheritors of benefits or seeking direct restitution or compensation from them for the harms caused by climate change. Third, the ‘unjust enrichment’ BPP provides a deeper explanation of the intuitive principle that the rich states should shoulder the primary burden of avoided deforestation even though the avoided emissions and enhanced removals are under the territorial jurisdiction of other states: since the rich states currently enjoy benefits that are not rightfully theirs in the sense that they have not been justly produced and transferred through the generations, a principle of strict liability arises for the disgorgement of the benefits. Fourth, the ‘unjust enrichment’ BPP does not rely on a ‘thick’ cosmopolitan ethic (where national or generational boundaries have no normative force) and therefore may be more politically feasible and less morally controversial than the APP. To the extent that unjust benefits will be transferred inter-generationally, and inter-nationally, this account will advocate that different states bear different climatic burdens, but it does not presuppose any strong duty to assist other states cope with disadvantages that cannot be connected to the former’s income or wealth.

Three Objections

The preceding account has attempted to shift the focus of rainforest protection burdens away from familiar principles of climate change burden sharing (such as ‘historical responsibility’ and ‘ability to pay’) towards the principle that the beneficiaries of climate change should bear the financial burdens of avoided deforestation in proportion to how much present benefit they enjoy that can be traced to productive activities that alter the climate system. Whilst the ‘beneficiary pays’ approach to burden sharing raises a number of normative puzzles in any context (Pasternak 2014; Butt 2007), I respond here briefly to three challenges for its application to the problem of avoided deforestation.

Questioning the Disgorgement of Involuntary Benefits

Properties of the process through which benefits were transmitted down the generations to their present-day beneficiaries may seem to block the generation of duties of fairness in many cases. Many benefits passed on by earlier generations that would not have been created ‘but for’ the release of large amounts of CO₂, for

example, appear to have the quality that they could not have been refused by their current owners. It might seem unfair, therefore, to require the current owners of such benefits to disgorge (some of) these benefits for the sake of financing avoided deforestation since this seems to involve holding the current beneficiaries responsible for rectifying environmental problems that arose from activities that created benefits that no owner received voluntarily. If this reasoning is correct, then a developed state could, on behalf of its citizens, reasonably reject the request that it surrender a proportion of its current wealth that can be connected to climate change (its ‘climatic benefit’) to fund avoided deforestation measures undertaken in the developing world even if developing states could be found that were willing to take responsibility for operational control of the relevant policies. This is the problem of involuntary (or ‘forced’) benefit (Meyer and Roser 2010, p. 243).

The involuntary benefit problem clearly has a bearing on what can legitimately be asked of states on the basis of unjust enrichment. However, it seems an exaggeration to say that it fatally weakens the unjust enrichment BPP. Successive generations have inherited benefits for which they had little, or no role, in creating. They have also, since the 1980s, when the basic science of climate change became well understood internationally, continued to enjoy the benefits of industrialization without undertaking significant measures of climate mitigation. It seems plausible, then, to argue that for at least 30 years, in which time over half of the current stock of anthropogenic greenhouse gas has accumulated, existing states have benefited *knowingly* from the activities that cause climate change. It is consequently unclear how it could be reasonably maintained that benefits in this period created by climate change exacerbating activities have been ‘forced upon’ the present generation for, while the benefits may have been involuntarily received in some cases, the retention of the benefits appears all too voluntary. Next, it might be claimed that, even if each generation has little opportunity to offer its explicit consent to the benefits it inherits from the past, it does not seem plausible to argue that it would have declined to enjoy the benefits of industrialization had it been given the opportunity given the huge boost offered by these benefits in quality of life terms. Many benefits of industrialization (such as increased longevity, sanitation, leisure time, material affluence) are ‘presumptively beneficial’ in the sense that they are so clearly an advantage to a wide range of lifestyles that their acceptance can be treated as voluntary (Page 2007, p. 237; Armstrong 2015, p. 10). Finally, while it might be questioned whether such a hypothetical standard of consent should play any role in our account of climate burden sharing, it is surely relevant that no more than a very select group of states have acted to intercept the continuous line of benefits their citizens have enjoyed as a result of activities that cause climate change since understanding of the problem became widespread. The actual behaviour of beneficiary states since 1990 undermines claims that they would have declined the associated benefits had they been given the choice (Butt 2007, p. 151; Caney 2009, p. 209).

Questioning the Isolationism and Atomism of the Account

The ‘unjust enrichment’ BPP, drawing upon Simon Caney’s useful terminology, is an *isolationist* and *atomist* account of climatic justice (Caney 2012, pp. 258–259). That is,

it ‘isolates’ questions of climate change justice from other problems (or ‘spheres’) of justice and ‘atomizes’ (or, in other words, *further isolates*) questions of climatic justice concerned with mitigation from connected questions of adaptation, loss and damage.

Isolationist accounts will be viewed with suspicion by integrationist theories of global justice (such as theories of equality, sufficiency, utility, basic needs, or human rights) which hold that benefits and burdens arising from mankind’s shared use (and abuse) of natural resources should be distributed in line with a preferred pattern of justice and not a climate-specific burden sharing arrangement that could disrupt the preferred pattern. The question arises, then, how the ‘unjust enrichment’ BPP could be rendered compatible with a range of views on the appropriate pattern of distributive justice that should hold within and between generations. One response to the problem of isolationism would be to claim that reasonable disagreement over the appropriate pattern of global and intergenerational distributive justice means that endorsing the ‘unjust enrichment’ BPP would mark a reasonable compromise between rival moral outlooks, including cosmopolitans and nationalists who disagree on whether natural resources belong to the states in whose territories they are located. The ‘unjust enrichment’ BPP finesses the problem of whether there is an ideal distribution of benefits and burdens that would be more appealing than the present distribution by emphasizing that, at present, many agents are committing an injustice by forcing others to bear the costs of damaged by activities that have benefited these agents. As a principle of corrective rather than distributive justice, the ‘unjust enrichment’ BPP is by nature ‘isolationist’ since it seeks to rectify a specific past injustice rather than establish a new and favoured distribution of resources in some jurisdiction. However, it is non-isolationist in the sense that the principles of unjust enrichment can be applied in any sphere of human activity where benefits have been created and enjoyed by some at the expense of others.

Turning to the ‘atomism’ of the account, it is undeniable that the ‘unjust enrichment’ BPP is atomist in its handling of the duties associated with financing and executing avoided deforestation measures since its account of duties is applied to (one form of) climate change mitigation in isolation of climate change adaptation or compensation. The account may be subsequently applied to these challenges or it may not but this further application is not seen as relevant to its strength as an account of just avoidable deforestation.² This narrow focus might be justified to the extent that it helps us develop a scientifically informed and policy relevant account of one aspect of justice that can be later integrated with a broader account of what users of the atmospheric commons owe to each other. However, it could be argued further that the ‘unjust enrichment’ BPP is hyper-atomist in the sense that it explores fair burden sharing in the context of avoided *tropical* deforestation in isolation of other terrestrial greenhouse sinks (such as the oceans and non-forest soils) as well as other types of forest that sequester carbon (such as boreal and temperate forests). Why treat fairness in the distribution of avoided deforestation in isolation of other activities under human control that mitigate climate change? And how, if this

² As Fabian Schuppert (2016) puts it usefully elsewhere in this issue, atomist accounts of just climate mitigation such as the ‘unjust enrichment’ BPP reject the claim that the duties of states to contribute to the costs of avoidable deforestation are reducible to ‘a wider, more general duty to contribute towards global climate justice.’

particular ‘eco system service’ is treated as unique and therefore requiring a unique burden sharing solution, should it be integrated into a comprehensive solution to mitigation, adaptation and compensation of climate change? There is an interesting parallel here between the ‘policy beneficiary’ BPP and ‘unjust enrichment’ BPP versions of the BPP. Armstrong suggests that the ‘policy beneficiary’ version can be integrated into a broader account of climate change mitigation by permitting states to choose how they fulfill their burden sharing duties either by financing forestry sequestration in developing states or by undertaking some other mitigation activity of equivalent effect that would not have been undertaken otherwise (Armstrong 2015, p. 13). This option of ‘mitigation burden offsetting’ also arises for states bound by duties generated by the ‘unjust enrichment’ BPP so long as these states also recognize the existence of a deeper, residual, injustice, ignored by the ‘policy beneficiary’ BPP, that the inhabitants of the developed world continue to benefit disproportionately from an unequal distribution of global wealth and income made possible by the pathway of fossil fuel industrialization now blocked to developing states.

Identifying the Beneficiaries of Climate Change: The Non-identity Problem

One problem in linking a duty to contribute to the cost of avoided deforestation with the receipt of the benefits of fossil fuel industrialization is that it might be objected the activities that contributed to the emergence of climate change played a minor, if necessary part, in the coming into existence of citizens of all states (Page 2011, pp. 423–424). Few if any individual persons who currently live, then, can be coherently be said to have *benefited* from past activities that cause climate change since they could not have *existed* in the state where they did not enjoy these benefits. The claim that the current denizens of developed states have benefited, unjustly or otherwise, from climate change is, consequently, puzzling on standard accounts of what it means to be benefited and as a result it seems *unjust* to require ‘enriched’ states to surrender ‘benefits’ enjoyed by their populations in order to preserve a climate system untouched by the threat of dangerous anthropogenic interference. To finesse this ‘non-identity problem’ by insisting that *states* are the subjects of climate change justice and should therefore surrender climatic benefits under their control to fund avoided deforestation does not solve the puzzle of how any agent can be obliged to disgorge a benefit to tackle a social problem with which this benefit shares a common origin if no beneficiary can be identified.

The non-identity problem raises complex issues far beyond the scope of the paper, but there are reasons to doubt that it poses a strong challenge to beneficiary pays reasoning in this context. Though it may not be possible to benefit *someone* by bringing them into existence into an affluent society whose affluence has origins in fossil fuel-based industrialization, it is still the case that *benefits* have been produced and transferred over generations to generate this affluence. Members of less affluent states which have not industrialized in this way can still say to their richer neighbours: ‘you would not be enjoying these benefits if it was not for the carbon emitting activities that caused the climate problem to arise that less privileged agents such as myself now have to tackle through avoided deforestation within our

state and, as a result, you should surrender these benefits to the climate change mitigation response.’ The unjust enrichment BPP can be conceived as a way of transferring burdens between these two societies without being tied to the ‘person-affecting’ requirement that acts and social policies are only permissible if they make at least one individual person better off than they would have been. It may be true that no individual in the developed world is better off than they would have been, all things considered, had industrialization not occurred since they would not have existed had it not occurred. However, the inhabitants of developed states are undeniably currently in control of trillions of dollars of accumulated wealth—not to mention political power and influence—that would not exist ‘but for’ processes of industrialization responsible for climate change. A small proportion of this wealth, according to the ‘unjust enrichment’ BPP, should be surrendered to fund measures of avoided deforestation in developing states as this wealth owes its existence to climate changing activities and not because the inheritance of this wealth from previous generations made its current owners better off, or victims of climate change worse off, than they would have been. The ‘unjust enrichment’ BPP is, in this sense, a species of *impersonal* corrective justice in the sense that it requires developed states to disgorge benefits that their citizens cannot rightfully retain to correct an ongoing injustice with which these benefits share a common origin. It is not a valid reason to resist such disgorgement, on this view, that no particular citizen of a developed state could coherently be said to have benefited from being brought into existence into a community whose affluence could only have arisen in a world characterized by the threat of dangerous climate change.

Conclusion

One novel approach to climate change mitigation generating increasing interest amongst policymakers and normative theorists involves developed countries financing measures adopted within the territories of developing states to protect and enhance natural processes, such as managed tropical forests, that withdraw substantial amounts of greenhouse gas from the atmosphere so that they can play no further role in changing the Earth’s climate. One normative justification of such an approach is that developed states have benefited far more than developing states from activities that cause climate change and so the former should bear a much greater share of the costs of designing and implementing measures of climate change mitigation, such as avoided deforestation, than they currently choose to bear. In the paper, I investigated some of the normative questions that arise in making sense of this ‘unjust enrichment’ account of climate change mitigation burden sharing before defending the account against some prominent objections raised in the literature.

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