Let's Be Rational: A 'Fair Share' Approach to Carbon Emissions

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The climate crisis represents a serious threat to our way of life. Without drastic changes to our carbon emissions, we will see considerable and irreversible harm to the environment. There is a growing literature regarding the moral obligations of states, sub-state actors (such as local governments) and industries to curb their carbon emissions (see, for example, Moss 2015). There are also arguments that we, as individuals, have similar obligations to curb our own emissions. Usually, such arguments are based on the claim that our emissions cause or increase the likelihood of harm to others (see, for example, Lawford-Smith 2016 and Broome 2019). But detractors raise questions about how much – if at all – our individual actions truly make a difference (see, for example, Sinnott-Armstrong 2005). This chapter focuses on a relatively novel approach to individual carbon emissions; an approach that sees these emissions as a scarce communal resource, that, like other scarce resources such as a food, water or medical supplies, needs to be rationed. Under this approach, the wrongness of our individual carbon emissions does not depend on harm being caused. Instead, it requires that an individual has consumed more than her 'fair share'.

1. The Problem with Harm

The simplest way to point out the moral wrongness of an action is, perhaps, to demonstrate that it causes harm. Such a move relies upon the harm principle, which – at its simplest – is the presumption that (all other things being equal) we have a moral obligation not to perform an act that causes harm to others. Put another way, actions are *prima facie* morally impermissible when they make a negative difference in the welfare of other people. But while the collective emissions of a country's coal-fired power industry, for example, may clearly affect people's welfare in this way, it is much more difficult to establish that our individual emissions are capable of making such a difference. This is due to the fact that, in most cases, our personal emissions do not directly cause harm in any robust sense. Suppose I engage in what Kingston and Sinnott-Armstrong (2018) refer to as 'joyguzzling' – that is, going for a wasteful Sunday drive in my gas-guzzler. Even if I do so, climate change – and thus harms related to climate change – will not occur unless many other people engage in the same kind of behaviour. Given this, my high-emitting choice is neither necessary nor sufficient for climate change, and therefore makes no difference to the welfare of others. Joyguzzling – like any high-emitting individual activity – is, to use Sinnott-Armstrong's (2005, 290–291) analogy, like pouring a quart of water into a river that is going to flood downstream due to excessive rains. My individual action makes little-to-no difference.

One way around this problem might be to adopt a more general harm contribution principle, according to which we have a moral obligation not to make problems worse. But, as Sinnott-Armstrong (2005, 293) notes, this principle does not get us much further. Climate change only becomes worse if the harm it causes becomes worse – in other words, if more humans or animals are harmed or harmed to a greater extent. But there is no reason to think that my single joyride will make any particular human or animal worse off, so once again the problem of difference-making arises.

Perhaps, however, our moral responsibilities regarding our individual carbon emissions need not rely on them making a demonstrable difference in others' welfare. While an individual high-emitting action (like joyguzzling) might not actually be harmful, the expectation of harm associated with this action might be enough to make it wrong. As John Broome (2019, 114) puts it, '[W]hen you consider whether or not to joyguzzle that Sunday afternoon, you cannot know what good or harm will actually result from what you do. The result may be a typhoon or a child's death, or it may be good'.

Holly Lawford-Smith (2016, 68) explains how this uncertainty of outcomes arises from the highly probabilistic connection between greenhouse gas (GHG) concentrations and global temperatures. Further, the existence of micro-level thresholds (the GHG concentrations required to cause an extreme weather event like a flood, drought, bush fire or typhoon) and macro-level thresholds (the GHG concentrations required to cause irreversible climate- related catastrophes like massive tree death in the Amazon or the thawing of Arctic ice and the Serbian permafrost) makes it even harder to pinpoint which specific individual's actions made the difference (Lawford-Smith 2016, 68-70). But this does not entail that nobody's action makes a difference. Lawford- Smith (2016, 76, emphasis added) notes that duty must instead be understood probabilistically in such cases, so that individuals 'have duties not to perform the actions that can be reasonably expected to cause certain kinds of harms'. Emitting carbon makes the planet warmer, and the warmer the planet gets, the higher the likelihood of extreme (harm-causing) weather events becomes. Indeed, while methodologies differ, one calculation estimates that the average American causes – through her GHG emissions – the serious suffering and/or death of one or two future people (Nolt 2011, 9). Suppose, to use entirely artificial numbers, that my Sunday joyride is shown to have a 0.0002% chance of triggering a catastrophic weather event that will cause one million deaths. If this is so, then the expected cost of my joyguzzling is two human lives. When couched in these terms – and when the paltry benefit I gain from my joyride is truly considered – it becomes difficult to see how there could be any argument for the moral permissibility of such behaviour.

However, applying this argument to individual contributions to climate change in the real world is much more difficult. For one, it is worth considering whether we really wish to accept this kind of argument at all. Garrett Cullity (2015, 152–153) makes a parity argument, noting that there is a correlation between ambient noise levels and the incidence of aggressive behaviour. Given this observation, it is therefore possible for me to reduce the probability of a violent incident by being quieter. Despite this, it seems hard to accept the claim that I act wrongly if I do not do all I can to minimise my noise levels. Of course, as Cullity (2015, 153) notes, there are important factors that distinguish between these two cases: specifically, the expectation of harm (which is much greater in the case of carbon emissions), the associated of cost of offsetting (which is much less in the case of carbon emissions) and the remoteness of the causal contribution (which is less in the case of carbon emissions, since the ambient noise example relies on an additional third party to actually *engage* in the violent behaviour being causally contributed to).

Nevertheless, these factors complicate matters. While there may be a better case for a moral obligation to reduce individual contributions to carbon emissions than to reduce individual contributions to ambient noise, is it good enough? In order to answer this question, we would need to compare the relative size of the expected harm with the cost of offsetting and arrive at some kind of conclusion regarding when the scales are tipped in favour of a moral obligation to offset. At what level of expected harm are we expected to act? Precisely what kind of cost can we be fairly expected to pay for this offsetting? Further, we need to consider what effect the strength (or weakness) of our causal connection to the expected harm will have on our moral obligations. Does it discount the amount of offsetting expected from us? Given these complexities with a harm-based approach, it seems prudent to consider whether there might be another way to provide us with a moral reason to avoid excessive personal carbon emissions. That is what I examine in the remainder of this chapter.

2. Zeno's Punch Bowl

The fair share approach is perhaps best illustrated with an analogy. Suppose there existed a magical item called Zeno's Punch Bowl – so named for its ability to complete an infinite series of philosophical social events. The exact mechanism by which the punch bowl operates remains a mystery, but its characteristics are universally known among philosophers. The bowl is an ornate copper receptacle, etched with the faces of academic titans. It is capable of holding 101 250-millilitre cups of the most delicious beverage ever enjoyed by man. Herein lies the magic: if, at the

end of any social event, at least one cup of punch remains in the bowl, the bowl will magically replenish its entire reserve of punch in time for the next social event.

The bowl is dutifully transferred from one philosophical event to the next: from the Annual Convocation of Free Will Compatibilists to the Central Meeting of the Rawlsian Veilers. At each event, the attendees make sure to leave at least one cup of punch remaining in the bowl, so that future assemblies of philosophers can continue to enjoy this wonderful resource. Demand is so high for the bowl, however, that no academic can expect to come across it more than once in their lifetime.

The bowl has now found its way to my local regional philosophy conference – its magical properties known to all in attendance. There are precisely 100 individuals (including myself) present at the conference. During the lunchtime frivolities, I pour myself a single cup of punch from the bowl. I taste it and am overwhelmed with joy at the flavour. I quaff my cup, then look guiltily at the still half-filled bowl. What harm could one more taste do? I quickly refill my cup, then hurry from the scene.

What, precisely, is wrong with my action? We might claim that by taking a second cup for myself, I am causing harm to other individuals by causing a reduction in their welfare. The punch bowl holds precisely 101 cups of punch, one of which must remain in order for the punch bowl to retain its magical abilities. There are, then, 100 'consumable' cups of punch in the bowl. Since there are one hundred attendees, there is only sufficient punch for one cup per attendee. By taking a second cup, I harm the other attendees by limiting the punch that they might enjoy.

But does this explanation really capture what is wrong about my actions? The punch is a continuous, not discrete, resource, so by enjoying a second cup I am not necessarily removing the ability of any other individual to enjoy the punch. Where the remaining 99 attendees could once share 99 cups between them, they can now only share 98. Where each attendee would have received 250 mL of punch, now they can only receive 247.5 mL. Does it even make sense to label such a miniscule reduction as harmful? Would there even be any appreciable difference in each attendee's experience of their cup of punch and therefore their welfare? It would seem not. In fact, given the discrepancies in different individuals' cup-pouring techniques, this small reduction most likely falls well within the margin of error of a standard cup pour, meaning that many individuals may still drink exactly the same-sized cup of punch they would have drunk had I not even acted. For this reason, claiming that my action is wrong for reasons of causing harm is flawed. We must look for an alternative analysis.

Maybe we could claim my behaviour is wrong because it amounts to something called free-riding. This occurs when an individual fails to contribute to a public good that she herself benefits from, like riding the bus without paying for your fare. The public good here being contributed to is the sustained magic of Zeno's Punch Bowl so that the bowl can be used by future assemblies (and, indeed, future generations) of philosophers. Since the bowl holds 101 cups, and one cup must remain, each individual's contribution should amount to restraining themselves to drinking one cup of punch at most. I, on the other hand, show a blatant disregard for the required restraint. But while it is clear that I fail to contribute, it is less clear whether this amounts to a case of free-riding. By stipulation, we have made it clear that no individual will be able to enjoy the wonders of Zeno's Punch Bowl twice in their lifetime. As such, the benefit to which I am expected to contribute – the sustained magic of the punch bowl – is one that I will never enjoy. My action, then, is not wrong by virtue of free-riding.

3. The Wrongness of Taking More than Your Fair Share

Why is it wrong for me to take a second cup of punch? One answer might be that it is wrong because it involves taking more than my fair share of the punch. If there are 101 cups of punch in the bowl and one of these cups must remain, then there remain 100 'available' cups for attendees to drink. If there are only 100 attendees, then all else considered, it would seem that a fair division of the resource would be an *equal* division of the resource. Any individual who appropriates more than an equal division of the resource would be acting *unfairly* towards their colleagues. They would be breaching a duty to take on the burden of restraint. This is the very thing that makes my action wrong.

We can apply the same reasoning to climate change and carbon emissions. In order to avoid the most catastrophic effects of climate change, the average global temperature increase must be kept below a certain level. Doing this requires that our total carbon emissions are capped. Once the volume of previous emissions is taken into account, this leaves us with a remaining, finite carbon budget representing the total carbon emissions we can create while avoiding catastrophic climate change. Once we recognise carbon emissions as a scarce communal resource we must, by necessity, engage in rationing. Presumably, there is some equitable way of rationing between states, sub-state actors, industries and individuals. Once this is done, it is merely a case of looking to whether or not any individual is emitting more than their 'fair share' of those emissions.

This approach differs from most other approaches to individual carbon emissions as it moves away from focusing on whether or not individual emissions actually make a tangible difference to climate change, and instead focuses purely on whether individuals are overconsuming a scarce resource – a considerably easier question to answer. This approach is, in many ways, the same one we might take in considering any kind of scarcity-of-resources scenario. When food is rationed, the immorality of taking more than your fair share is not found in the fact that you might be causing harm to others (though you very well may be), but merely in the fact that you are exceeding your own fair allocation.

A further advantage of this approach is that it places moral restraints on our behaviours regardless of the actions of others. If several other conference attendees also decide to drink multiple cups of punch, this does not suddenly excuse my actions. Likewise, any other attendees who have up until this point shown restraint are not suddenly licensed to take all they want. Every one of us who decides to drink a second cup of punch is in the wrong for breaching our duty to take on the burden of restraint. Non-compliance by others is immaterial to our own obligation to take no more than our fair share.

4. Fair Shares and Carbon Emissions

How do our actual carbon emissions match with our fair share? If the former exceed the latter, then we are acting unfairly and have a moral obligation to curb our emissions in any way possible. Unfortunately, performing such a calculation is notoriously difficult. While discovering our actual individual carbon emissions per year is relatively straightforward, ascertaining precisely what amounts to our 'fair share' is much more difficult. This is largely due to the arbitrariness of many of the lines we must draw, such as, for example, the amount of harm from climate change we are willing to tolerate (some harm is already occurring and therefore inevitable) and the likelihood we are willing to accept of this harm occurring. However, even under the most generous approach, our moral obligations regarding individual carbon emissions are plainly clear.

In 2011, nearly all countries agreed to limit the global average temperature rise to no more than 2°C above pre-industrial levels – the maximum global temperature rise we can tolerate while avoiding the most catastrophic effect of climate changes (2011 United Nations Cancun Agreement). According to the Intergovernmental Panel on Climate Change, having a >66% chance of achieving this would require us to keep our global carbon emissions below 2,900 gigatonnes of carbon dioxide (GtCO2) (IPCC 2014, 10). As of 2021, only 607 GtCO2 remain in the global carbon budget (Evershed 2017). Divided equally amongst the 7.9 billion people on Earth, this comes out at lifetime carbon allowance of 76.8 tonnes of CO2 per person – or around 0.895 tonnes per year over an 85-year lifespan.

It may, of course, be the case that an equal division of a resource is not necessarily a *fair* division of that resource. Suppose a university departmental meeting is catered with 20 cupcakes and that 10 professors are in attendance. Absent any other relevant factors, it seems that the fairest division of these cupcakes would be an equal division – that is, two cupcakes per professor. The introduction of other factors may modify this, however. Suppose that there were, in fact, 25 cupcakes, and that one professor arrived earlier and has already eaten five of the cupcakes. Such evidence may affect the fair division of the remaining 20 cupcakes. Suppose, alternatively, that one professor has forgotten his lunch that day and has nothing else to eat and that two other professors brought ample lunch and have no need for the catering. These may also factor into what would count as a fair division.

Calculating precisely what amounts to a fair share of a scarce communal resource is no easy feat. As seen above,

factors such as (1) an individual's responsibility for the shortage of a resource, (2) an individual's need for the resource, and (3) an individual's ability to forego a resource will all be relevant. The first of these factors is particularly relevant in the context of carbon emissions. Fairness might demand that individuals living in historically high-emitting countries receive a smaller share of carbon emissions going forward, while those in historically low-emitting countries receive a larger share. Further criteria can also be found in the literature on the distribution of scarce medical resources, where the fairness of an allocation might be influenced by contribution, ability to pay and merit (Maddox 1998), as well as temporal priority (i.e., first come, first served), chance, utility (i.e., who can make best use of the resource), social worth and effectiveness (Bringedal 1992). In fact, philosophical discussions of climate change are already familiar with many of these factors, as they are the very same kinds of criteria that are considered when establishing how to divide the global carbon budget between countries.

For those living in traditionally high-emitting countries, the most generous budget can be arrived at by mapping current carbon usage against the proportional reduction required of the 2°C target. Put simply, the attainment of this target requires that emissions peak around 2020, drop 50% by 2045 and fall below zero by 2075. Carbon Brief provides an analysis of individual carbon budgets based on this metric – that is, past emissions reduced according to proportional targets. On this analysis, a child born in the United States (US) in 2017 will have a lifetime carbon budget of approximately 197 tonnes of CO2 – or 2.31 tonnes per year over an 85-year lifespan – in order to keep to the 2°C target (Hausfather 2019).

So, how does this compare to our actual individual emissions? In 2017 (the most recent year for which data are fully available) those in the US emitted 16.16 tonnes of CO2 on average – almost seven times the fair share proposed above (Ritchie and Roser 2020). This means that an individual born in 2017 will have used up their lifetime share of carbon emissions before their thirteenth birthday.

There is one important wrinkle in this data, however. Specifically, these emissions figures are based on per capita, not necessarily individual, emissions. In other words, theis number represents the sum of emissions in the US divided by population. It pays no attention to whether these emissions are produced by individuals personally (say, by going on a leisurely Sunday drive), by infrastructure (e.g., bitumen production for roads) or by private industry. There is a good chance that a large portion of that per capita budget is contributed to by activities over which individuals have little-to-no direct control (how electricity is produced, how public transport is fuelled, what kind of industries our economic structure incentivises, etc.). While excessive systemic emissions might provide us with moral impetus to engage in political action to change those systems, we are here concerned specifically with our moral responsibility for those emissions over which we have direct control.

However, even if the emissions over which we have direct control only make up some small part of per capita emissions, it is significant enough to lead to some strong moral conclusions. A first point of focus is often those emissions deemed 'luxury emissions' (Shue 1993). A one-way flight from Los Angeles to Auckland will contribute 1.48 tonnes of carbon – more than a US individual's annual budget – in the space of a single day (figure calculated via Carbon Footprint). But we need not even look to luxuries to raise serious concerns. The average person living in the US releases 2.83 tonnes of CO2 per year through residential energy use alone (Goldstein et al. 2020). This puts most Americans over budget before even considering other necessities like food, transport, clothing and pharmaceuticals. If you opt to have a child, then any hope of remaining under-budget is entirely forfeit. Ignoring any other carbon emissions created in their lifetime, a US individual who chooses to have a single child will exhaust their entire lifetime's carbon budget in less than three years (Murtaugh and Schlax 2009).

Does this mean that we should disconnect our homes from the power grid, reduce our food consumption and give up on having children? Not necessarily. For one, it is important to note that while the above sources of emissions are listed as those over which we most likely exercise direct control, this is not necessarily the case for all individuals. Consider the example provided by Christian Baatz (2014, 10) of,

an (elderly) person living in a rural area in the US who depends on her car to buy food and to participate in social and cultural activities because no public transport system is available or she is not able to use it. Let us further assume that she lives in a poorly insulated house, lacks the means to invest in improved insulation and there are no

governmental programs subsidizing credits etc.

In such a case, Baatz (2014, 10) argues, expecting this woman to lower her emissions would be asking too much, given the burdensome hardship resulting from such a reduction. Put simply, 'her life would not be decent anymore'.

This much is certainly true, and expecting this woman to reduce her emissions by foregoing food or participation in social and cultural activities would no doubt be entirely unreasonable. It is hoped, however, that whatever metric we adopt for calculating a 'fair share' of emittable carbon would take into account these very needs. Indeed, we might argue that any purportedly 'fair share' that did *not* accommodate needs such as these would not in fact be fair at all. Such a case may, for example, be a strong counterexample to the presumption that a fair share is an equal share (since an equal division of emittable carbon is unlikely to give her enough to fulfil these necessities of life).

All of that aside, just because *some* emissions of *some* individuals cannot be reduced under any that just theory, that does not mean that many if not most individual emissions are open to scrutiny. While there are many things we cannot do without, there are many things that we can. In this way, the fair share approach requires us to seriously reconsider how we live, how we consume, how we travel and even how we reproduce. We can no longer avoid blame by claiming that we are already doing our part by merely recycling (reducing our emissions by 0.21 tonnes of CO2 per year on average), washing our clothes in cold water (a reduction of 0.25 tonnes of CO2 per year on average) or upgrading our lightbulbs (a reduction of 0.10 tonnes of CO2 per year on average) (Wynes and Nicholas 2017). While such measures are important, they must be coupled with far greater behavioural changes.

It is also unacceptable to say that in the grand scheme of things our individual carbon emissions 'make no difference'. Writing in *The Guardian*, Leah Stokes (2019) argues:

The next time you feel that you are to blame for climate change – because you forgot to hit the light switch, or you took that flight to see your ailing mother – remember the Ohio electric utilities and their coal subsidies. Remember the politicians who gave them… [a] billion-dollar bailout after receiving personal favors, like a flight to Trump's inauguration on a corporate jet. And know that one day after signing this bill, Ohio Governor DeWine attended a Trump fundraiser hosted by coal baron Bob Murray. Fighting the climate crisis is not about purifying yourself. It's about dismantling corporate power. Electric utilities are a great place to start.

But this is the very mindset against which the fair share approach is directed. While effective action on climate change will require the dismantling of corporate power, we cannot point exclusively to this solution and excuse ourselves of moral blame. Even if our emissions cause a miniscule amount of harm in comparison to the emissions of large industries, we are still morally blameworthy for the lifestyle choices we make that lead to excessive carbon emissions. The upshot is simple: even on the most generous account of what an individual carbon budget might be, those of us in developed nations like the US are – simply by virtue of the individual emissions over which we have direct control – currently producing far more than our fair share of carbon emissions. In this way, we are treating other members of our global community unfairly and, for this reason, are in breach of our moral obligations towards others. While the realities of infrastructural and political systems might make it impossible for us to completely avoid this breach for now, the onus on us is to do all we can to minimise it by reducing our individual emissions in any way possible.

5. Three Potential Objections to the Fair Share Approach

So far, we have examined the argument that excessive individual carbon emissions are wrong because they use more than one's fair share of a scarce communal resource. This means, however, that the entire argument rests on the very important first premise that emittable carbon is a scarce communal resource in the first place. One objection to the fair share argument might therefore be that this is simply untrue. 'Emittable carbon' is not a consumable resource. It is not finite let alone scarce in the same way that food, water or medicine might be. Every individual could, in theory, emit an infinite amount of carbon without removing from any other individual his or her right to also emit an infinite amount of carbon.

When we discuss the scarcity of the resource of emittable carbon, we are instead discussing something like a finite 'right to emit'. Emittable carbon is not scarce for factual reasons (as say, water is scarce when the town supply tanks are close to depletion), but rather for *moral* reasons. Given this, an independent moral argument is required for why this is the case – that is, *why* we must keep our global carbon emissions below a certain level.

This, however, is not a problem that is unique to the fair share approach. In fact, any argument that argues for a reduction in carbon emissions – be it by individuals or, more likely, by states and industries – will have this same first premise. Even those who argue against any kind of moral obligation to reduce individual carbon emissions usually grant the premise that there are independent moral reasons to establish an international carbon budget (see, for example, Sinnott-Armstrong 2005). They merely argue that this does not lead to any corollary obligation for individuals, since individuals do not make a difference.

The fair share approach argues from this same widely accepted first premise (that we have a moral reason to keep our total global carbon emissions below a certain level) that we each have a moral obligation to minimise our individual carbon emissions not because we make a difference, but because it is what fairness demands when dealing with a scarce communal resource. I contend that the existence of an exceedingly small (and rapidly diminishing) carbon budget automatically places an obligation on individuals to not exceed their 'fair share' of emissions, however miniscule that fair share might be and however little effect those emissions might have on the welfare of others.

A second potential objection has been raised by Ewan Kingston and Walter Sinnott-Armstrong (2018, 182), who claim that the fair share approach must be based on either the principle that:

(A) When an existing political or social structure encourages cooperation and discourages defection in a collective action problem, individuals have a moral requirement to obey the rule of that existing institution.

Or the principle that:

(B) When no existing political or social institution adequately encourages cooperation and discourages defection in a collective action problem, individuals have a moral requirement to obey the rules of a hypothetical institution that would be adequate or ideal.

Principle A, they note, seems true – but no such institution currently exists that has formally apportioned fair shares of emittable carbon. All that remains then, is Principle B, and it is this principle to which Kingston and Sinnott-Armstrong object. They note that this principle fails in certain cases, citing one specific example: 'Imagine a country with an inequitable health-care system, that places the lives of many vulnerable people in jeopardy, increasing inequality. The inequities would be removed if everyone paid 3% more for taxes, and that money funded equitable health care for all' (Kingston and Sinnott-Armstrong 2018, 182–183). In the absence of such a system, they argue, there would be no moral requirement for an individual to contribute the same amount of money to the government in the hope that the government would provide such services. In this way, Principle B is refuted.

This, however, may be too hasty. The example provided by Kingston and Sinnott-Armstrong shows that Principle B sometimes fails to generate specifically positive duties (that is, duties to actively do something). It seems, however, that it successfully generates negative duties (that is, duties to refrain from doing something). Suppose, to modify their example slightly, the inequity of this particular healthcare system was due to the active drug- seeking behaviour of a small portion of the population. These individuals exploit a loophole in the medical system that allows them to receive duplicate (and unnecessary) prescriptions, leading to a shortfall in the system's thinly stretched medical resources and subsequently creating inequities for other citizens. The legislature is currently attempting to close this loophole, but in the meantime it would seem there is a moral obligation on drug-seeking individuals to adhere to a negative duty to refrain from seeking extra medication.

In light of this observation, we might modify Principle B as follows:

B*: When no existing political or social institution adequately encourages cooperation and discourages defection in a collective action problem, individuals have a moral requirement to assume the negative duties of a hypothetical institution that would be adequate or ideal.

Principle B* is narrower than Principle B, but is all that we require in order to motivate the fair share approach. Better yet, it is not vulnerable to the types of problem cases raised by Kingston and Sinnott-Armstrong.

A final potential objection surrounds what we are to say about those individuals who already emit less than their fair share of carbon. Would fairness not dictate that those individuals be permitted to emit more carbon than they currently do? A potential response to this objection is two-fold. First, we must carefully consider whether or not such individuals even *exist*. There are, to be sure, countries whose citizens emit carbon at a very low rate. Pakistan, for example, emitted 1.12 tonnes of CO2 per capita in 2017 – a mere fraction of what the US emitted (Ritchie and Roser 2020). However, if the carbon budget of individuals living within Pakistan is arrived at via the same process as the carbon budget for individuals living in the US (that is, by mapping their current carbon usage against the necessary proportional reduction required of the 2°C target), individuals within Pakistan are still coming in over budget, with those born in 2017 receiving an annual carbon budget of only 0.11 tonnes (Hausfather 2019).

But suppose that under-budget individuals *do* exist. On the fair share approach, would it be morally permissible for them to emit more? The simple answer is 'yes'. If an individual with a carbon budget of 1.5 tonnes were only emitting 1 tonne of carbon per year and decided to increase their emissions up to 1.1 tonnes, then they would still be taking less than their entitlement and, as such, there could be no fair share-based moral objection to their behaviour. Nevertheless, this would not be the end of the discussion. Their decision to increase their emissions purely on the basis that they are entitled to more may be morally blameworthy for a raft of other reasons external to the assessment we have outlined here. Perhaps their actions would be morally blameworthy because they were wasteful: consuming resources and emitting carbon when they did not need to. Alternatively, there may be a compelling case for some kind of 'slack-taking' principle, according to which any individual who *can* consume less than their fair share should consume less than their fair share, in order to offset those individuals who inevitably consume more than their fair share. In any case, the fair share approach will not and does not purport to exhaust all grounds for the moral impermissibility of intentionally increasing one's individual carbon emissions.

Conclusion

The fair share approach to individual carbon emissions is based on considerations of what is fair when rationing a scarce communal resource. It does not require us to point to actual or potential harm caused to current or future persons. Instead, it derives the moral impermissibility of excessive individual carbon emissions from the fact that it is unfair to take more than one's fair share of a scarce communal resource. Given even the most generous allowances for an individual carbon budget, it appears that most if not all of us are already exceeding our 'fair share' of carbon emissions. Given this, there is an onus on us to do all we can to reduce our future emissions by any way possible.

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