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Towards a Just Solar Radiation Management Compensation System: A Defense of the Polluter Pays Principle

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In their 'Ethical and Technical Challenges in Compensating for Harm Due to Solar Radiation Management Geoengineering' (2014), Toby Svoboda and Peter Irvine (S&I) argue that there are significant technical and ethical challenges that stand in the way of crafting a just solar radiation management (SRM) compensation system. My aim here is to contribute to the project of addressing these problems. I will do so by focusing on one of S&I's important ethical challenges, their claim that the *polluter pays principle* (PPP) is too problematic to be useful in determining responsibility for SRM compensation. Their argument for the latter claim consists in a series of allegations, mostly in the form of questions, that are thought to indicate serious difficulties standing in the way of using the PPP to craft a just compensation system. I will argue that S&I fail to substantiate these allegations: the PPP is not as problematic as S&I suggest, and moreover, is a viable candidate for determining responsibility for SRM compensation. S&I raise five allegations against the PPP. I will discuss each in turn.

The first allegation against the PPP is the difficulty of determining the 'kind of entity [that] should be held accountable for providing compensation … for harm caused by SRM deployment'. S&I support this allegation by citing Caney (2005). Apparently, S&I take Caney (2005) to have shown that applying the PPP is made difficult by an uncertainty regarding whether we should hold individuals or collectives (e.g., state or corporations) responsible for pollution.

Unfortunately, Caney (2005) does not provide direct support for their allegation. This is because Caney's discussion directly concerns only what we might call *first-order pollution* and not *second-order pollution*.[1] The former results from familiar activities like driving cars, deforestation, etc. An example is anthropogenic greenhouse gas (GHG) emissions. In contrast, second-order pollution results from attempts to ameliorate first-order pollution. An example would be the harm that might result from SRM deployment. Although the difficulty Caney raises for the PPP is that of identifying the polluter, his cases only involve first-order pollution. In his primary example, Caney notes that there are numerous sources of GHG emissions: individuals who drive cars, corporations that

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deforest, and international institutions (e.g., the World Trade Organization and the International Monetary Fund) that encourage the copious consumption of fossil fuels by promoting economic growth (Caney, 2005, pp. 754–755). Thus, with respect to GHG emissions, it is very difficult both to identify *the* polluter and to determine the relative contribution made by each source (or type of source) of pollution. This makes it very difficult to apply the PPP in these types of cases.

S&I do not attempt to show that this type of difficulty extends to the second-order pollution that might result from SRM. Moreover, there are reasons to doubt that it extends. Arguably, the difficulty would extend only to the degree to which second-order pollution is relevantly similar to first-order pollution. But the cases are dissimilar in an important way. The familiar cases of first-order pollution have a long, complicated, and obscure etiology. In contrast, an instance of the type of second-order pollution at issue—a specific harmful result of SRM deployment—would have a relatively simple and short etiology, presumably tracing back to either a collective or individual agent. In such a case, it would not seem difficult to identify the polluter—whether collective or individual—and apply the PPP. At the very least, identification would be *much less* difficult than in cases of first-order pollution. Thus, there are reasons to think that the difficulty Caney raises for the PPP would not arise in cases of second-order pollution.

In sum, S&I fail to effectively support their allegation that applying the PPP is made difficult by an uncertainty regarding whether we should hold individuals or collectives responsible for harm caused by SRM deployment. Moreover, this allegation is shown to be unsubstantiated by the dissimilarities between first- and second-order pollution.

S&I's second allegation against the PPP amounts to the following question: 'If states are held responsible, how should they raise revenue for a compensation fund? May they tax citizens who initially opposed SRM deployment?' I will sharpen their question as follows:

> Q2: Is it just for a state to raise revenue for a compensation fund by taxing citizens—including those who initially opposed SRM deployment?

S&I mention Q2 in the context of supporting their main thesis about the PPP. Thus, presumably, S&I think (i) Q2 poses a difficult question and (ii) this difficulty is one of the obstacles standing in the way of using the PPP to craft a just compensation system. Unfortunately, S&I offer no support for (i) or (ii). Moreover, even if Q2 poses a difficult question, the difficulty does not, and should not, stand in the way of crafting a just SRM compensation system.

To see why, notice that Q2 is similar to other significant questions: Is it just for a state to pay for a war by taxing citizens—including those who oppose it? Is it just for a state to pay for socialized healthcare by taxing citizens—including those who oppose it? These are instances of a more general question:

> Q2*: Is it just for a state to pay for something by taxing citizens who oppose it?

Q2* is a familiar general question about the justice of intra-institutional arrangements—about economic justice, property rights, tax schemes, etc. Thus, because Q2 is an instance of Q2*, the former falls under the scope of a general question that is the traditional and proper subject of political theory and related fields. As such, it may be that Q2 is an instance of a more general difficulty for crafting a just theory of government and intrastate

taxation. It is worth noting that the difficulty posed by Q2* has not prevented governments from taxing citizens who oppose war or socialized healthcare, and there seems to be nothing relevantly different about the SRM case. More importantly, because Q2 is an instance of a more general problem, it is not the *kind* of problem that a just compensation system should be expected to solve. Thus, Q2 does not pose a difficulty for crafting a just SRM compensation system. Finally, it would seem that on pain of violating the sovereignty of states, a just SRM compensation system *must* remain neutral on intrastate economic policies. If so, then a compensation system is just only if it does *not* presume to answer Q2.

In sum, a just SRM compensation system need not, and arguably should not, include rules for intrastate economics. Thus, Q2 does not stand in the way of using the PPP to craft a just compensation system.

The third allegation against the PPP concerns whether an agent that is causally responsible for the problem SRM aims to solve should provide compensation for those harmed by SRM. To identify the issue more precisely, suppose (i) individual or collective agent S engages in some activity A that is causally responsible for P1, an instance of first-order pollution; (ii) parties other than S deploy SRM to mitigate P1; and (iii) the latter SRM deployment leads to second-order pollution P2. We can now put the question this way:

Q3: Is S ethically required to provide compensation for P2?

As S&I note, answering this question is important for determining who is to provide compensation. Thus, the PPP can be used appropriately only if Q3 admits of a reasonable answer. But S&I do little more than *mention* Q3. They certainly do not say anything that would suggest that Q3 lacks a reasonable answer, nor do they show that Q3 marks a problematic ethical uncertainty that stands in the way of developing a just SRM compensation system.

Moreover, a reasonable answer to Q3 seems ready to hand. The answer partly stems from a principle which is plausible, widely held, and, ironically, at play in discussions of the PPP (including Caney, 2005). In general form, the principle says that an agent whose action brings about some harmful result is morally responsible for that result only if the agent was able or culpably unable to foresee that type of result. Applied to the above case, the principle has the following bearing on whether it is reasonable to hold S morally responsible for the first-order pollution that SRM would target: it is reasonable to take S to be morally responsible for P1 *only if* it is reasonable to affirm that S was either able or culpably unable to foresee that A might very well bring about P1 or something similarly harmful.

In this context, the relevant type of first-order pollution is the kind that SRM would attempt to address, such as anthropogenic GHG emissions. As S&I point out, it is difficult to identify the individual or collective agents causally responsible for first-order pollution like anthropogenic greenhouse warming. However, even if the agents could be identified, it is not obvious that those agents were able or culpably unable to foresee that their actions would have likely brought about harmful greenhouse warming. In other words, we have grounds for *suspending judgment* on the claim that those agents were able or culpably unable to foresee those effects. Thus, given the above general principle, it is not reasonable to affirm that the agents causally responsible for greenhouse warming are also morally

responsible for it. Instead, we should suspend judgment. In terms of our example, it is not reasonable to affirm that S is morally responsible for P1; instead, we should suspend judgment. However, if it is unreasonable to affirm that S is morally responsible for P1, then it is unreasonable to affirm that S is ethically required to compensate for any second-order pollution that results from another agent's attempt to address P1. Thus, it is unreasonable to take S to be morally required to provide compensation for P2.

In sum, although Q3 is an important question, S&I fail to show why it marks a problematic uncertainty standing in the way of using the PPP to craft a just SRM compensation system. And, more importantly, a reasonable answer to Q3 is available.

The next two allegations are somewhat entwined in S&I's discussion, but they stem from their claims about what the PPP would require of a state that is (i) impoverished, (ii) threatened by sea-level rise, and (iii) part of an international coalition that deploys SRM. According to S&I, in such a case, the PPP 'could lead to implausible and unfair requirements'. Because conditions (i) and (ii) represent importantly different contexts, I will discuss them separately and present what S&I allege that the PPP requires in each case.

S&I's fourth allegation is that the PPP puts unfair requirements on impoverished states. Their argument appears to be this:

> Suppose state S is impoverished and belongs to an international coalition that deploys SRM. According to the PPP, because S is an agent of SRM, S is responsible for providing compensation to those harmed by that deployment. But because S is impoverished, it is unfair to require S to pay compensation. Thus, the PPP puts an unfair requirement on S.

Whether this conclusion follows depends on something S&I fail to specify: *how much* compensation the PPP requires S to pay. Caney's macro-version of the PPP provides a reasonable way to provide the specificity. According to this way of understanding the principle, 'if actors X, Y, and Z perform actions which together cause pollution, then they should pay for the cost of the ensuing pollution in proportion to the amount of pollution that they have caused' (Caney, 2005, p. 753). Although Caney discusses how the macro-version applies in cases of first-order pollution, it would seem to apply equally well in cases of second-order pollution. And applied to the above case, the macro-version provides a way to specify how much compensation the PPP requires S to pay: S should contribute to compensation in proportion to the amount S contributed to the second-order pollution caused by the SRM deployment. In this case, S was part of a coalition that deployed SRM. Thus, a reasonable way to determine S's relative contribution to the second-order pollution is in terms of S's financial contribution to the coalition. Given that S is an impoverished state, its financial contribution is presumably going to be relatively small. If so, then according to the macro-version of the PPP, S would be required to provide relatively small proportion of the compensation due. By my lights, this is not an unfair requirement. Thus, understood in terms of Caney's macro-version, the PPP does *not* impose an unfair requirement on S. More generally, *pace* S&I, the PPP does not necessarily lead to unfair requirements on impoverished states.

S&I's fifth allegation is that the PPP leads to implausible requirements. Their argument appears to be this:

> Suppose S is a state whose survival is threatened by sea-level rise and thus decides to join an international coalition that deploys an instance of SRM designed (in part) to mitigate this threat. According to the PPP, because S is an agent of SRM, S is responsible for providing compensation to victims of that deployment. But this assumes that it is ethically appropriate to require a state to compensate victims of a policy that was necessary for that state's survival. But the latter assumption is implausible.

The problem with this argument is that it fails to acknowledge the scope restriction built into the PPP. The PPP does not range over all agents *causally* responsible for pollution. It ranges over all agents *morally* responsible for pollution. In fact, as noted previously, it is precisely because of this scope restriction that the PPP is difficult to apply in cases of first-order pollution. Given the etiology of such pollution, it is doubtful that the agents who are causally responsible for it are also morally responsible for it. Thus, in the case at hand, the PPP implies that S is responsible for compensation *only if* S is morally at fault for the second-order pollution. But by itself the PPP says nothing about whether S is morally at fault. Furthermore, as S&I themselves indicate, it is unreasonable to take S to be morally at fault in this case. They seem to have in mind here the plausible and widely held ethical principle that an agent is morally responsible for what her action brings about *only if* she did *not* act out of compulsion. But arguably, given that S's survival was at stake, S was compelled to participate in the coalition that deployed SRM. Thus, there are strong reasons to deny that S is morally at fault for whatever harms might result from that deployment. To sum up: S&I allege that the PPP leads to implausible requirements. These requirements are indeed implausible, but the PPP, properly understood, does not lead to them.

My aim here has been to defend the PPP against the allegations made against it by S&I. To be sure, I have not provided a comprehensive defense of the PPP. However, I hope that my limited defense provides grounds for taking the PPP to be a viable and promising candidate for determining responsibility for SRM compensation.[2]

Notes

[1] These labels seem apt but they are not intended to correlate with the way others may have used these terms. For example, Patrick Dugan (1972) uses these labels to mark a different distinction than the one I am marking here.

[2] I wish to thank Clare Palmer and Amy Garcia for helpful comments and discussion.

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