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4 Climate adaptation, moral reparation, and the baseline problem

Benjamin Hale, Adam Pérou Hermans, and Alexander Lee

> The purpose of the Strategy is to inspire and enable natural resource professionals and other decision makers to take action to conserve the nation's fish, wildlife and plants, ecosystem functions, and the human uses and values they provide in a changing climate.
>
> (US FWS, NOAA Fisheries, and AFWA 2012: 16)

Though tiny, the American pika (*Ochotona princeps*) is tough. The diminutive lagomorphs inhabit challenging alpine ecosystems – ecosystems that support only the hardiest of animals. Alpine winters are long and cold; vegetation and nutrients limited. Few other species persevere. Yet the pika is well adapted. During the short summers, they build and create stores of vegetation, essentially hay piles, providing food for the rest of the year. The alpine ecosystems that they call home are essentially "sky islands." Given that pika rarely disperse more than a kilometer, if their mountaintop habitat changes, they are as stranded as if they were at sea. With climate change, this is exactly what's happening (Beever *et al.* 2003; Grayson 2005; Mazer 2009; NPS 2012).

Climate change affects alpine ecosystems in ways that directly threaten the survival of the pika. It increases temperatures in the summer, allowing lower-elevation species (including predators) to move higher up the mountain, and alters snowpack in the winter, eliminating essential snow tunnels (Beever *et al.* 2003). These threats are so severe that the Center for Biological Diversity proposed in 2007 that the pika be the first species to be listed as endangered due to climate change, and thus protected by the US Endangered Species Act (Mazer 2009).[1] Saving the most vulnerable pika populations, such as those in the US Great Basin, may require moving them North to mountains in Montana or Canada in a process called "assisted migration" or "managed relocation."[2] Without such assistance, they are sure to die off (Grayson 2005).

There seems to be no great solution. The native pika in Montana and Canada are a different subspecies (*Ochotona princeps princeps*) than those in the Great Basin (*Ochotona princeps schisticeps*). Moving the Great Basin pika will alter the northern ecosystems, but not moving the pika will likely result in their extinction. No matter how one approaches the problem, one thing is certain: the Great Basin pika will go extinct in its native range. So here a familiar conundrum arises: ought

we to privilege the species or the ecosystem? Should we help these pika populations survive, or ought we to maintain "natural" alpine ecosystems in less vulnerable areas, while accepting that such ecosystems will be composed of slightly different species (Parmesan 2008)? The question is not only about which features of nature we assist in adaptation, but also what a successful adaptation might look like in the absence of a comparative baseline.

This "baseline problem" is familiar to restoration ecologists, but here it has a slightly different implication. Generally, the baseline problem is taken to be an historical and conceptual conundrum, mostly temporal in nature. Do we restore back to 1992 levels, 1892 levels, 1492 levels or 1092 levels? But there is another aspect to the baseline problem that emerges in the face of global climate change and that is reinforced by the implications of resilience theory (Holling 1973). Climate change will create no analog-futures, i.e. ecosystems with no historical counterpart (Fox 2007). For species-level evolution to continue, we must relocate those species in like-habitats to secure their continued survival (Hoegh-Guldberg *et al.* 2008). The baseline problem here is that we do not and will never have a baseline to restore conditions back to (Davidson and Simkanin 2008). The universality of climate change places us on a trajectory toward a state of the world that will be radically different than it ever has been. As a consequence, we can never restore "nature" to its original state, but will forever be assisting nature in adapting to new climatic states. Most importantly, this *new* baseline problem poses a potentially crippling challenge to arguments for adaptation that conceive of our obligation to assist in adaptation as emergent out of a responsibility to right the wrong of climate change.

In this chapter, we argue that adaptation obligations extend beyond simple adjustments in our own communities to include non-human species and wild ecosystems. We limit our discussion to the "Argument from Reparation," which suggests that our obligations to assist in adaptation stem from a moral obligation to right prior wrongs. For the purposes of brevity, we only tangentially discuss matters of intrinsic value of species and moral status. Our claim is that the argument from reparation gets off the ground not through the generally presumed line that one must repair damages or harms caused to victims. Instead, it rests on a prior failure to justify one's actions.[3] Our guiding suspicion here – a suspicion that we do not have the space to defend – is that obligations to aid and assist species and ecosystems track the ease or difficulty with which preliminary acts can be justified. Below, we will argue that obligations to aid and assist species and ecosystems in adaptation, in particular, follow from a failure to adequately justify – either by absence, neglect, omission, or malice – actions that caused, or coalesced to cause, climatic change. This position, we believe, effectively recasts the argument from reparation so that it no longer depends on the identification of a clear baseline, thus obviating the baseline problem and salvaging one line of argument for assistive adaptation.

The new baseline problem

There are, of course, many ways to justify assisting a species or an ecosystem in adapting to climatic change. One of the more prevalent is the argument from reparation, which goes as follows:

> Because climate change, and the consequences stemming therefrom, is a predicament of our own making, we have an obligation to assist nature with adaptation.[4]

This argument is sometimes also referred to as the "Causal Argument," though it has multiple instantiations and appears throughout the literature (Burkett 2009; Cairns 2003; Caney 2006; Gosseries 2004; Hale 2012; Hale and Grundy 2009; Neumayer 1999; Schüssler 2011; Shue 1999).

The baseline problem is tightly wound up in the argument from reparation, as it is generally thought to be a technical and a conceptual problem associated with an obligation to repair a wrong done. In the punishment literature, it is well accepted that many reparations are temporally asymmetrical, meaning that no reparation can ever fully return the world to its original state. One cannot un-murder the murdered and one cannot un-rape the raped, for instance. A victim cannot be made whole. One can, however, offer restitution to injured parties or their proxies. Thus, some punishments require that reparations be made to wronged parties by way of restitution.

In the restoration and remediation literature, however, the problem of reparation is complicated by several factors. First, there is the presumption that wrongs to nature can be mostly, if not entirely, reversed (Elliot 1982). Second, it is often presumed that wrongs require victims. And, third, some argue that future generations do not rightly offer up victims that are easily harmed (Parfit 1986). So, for instance, polluting companies are often required to restore polluted environments, perhaps also in conjunction with payment of restitution to victims. Almost always the victims of pollution to whom restitution is paid are human. If somehow the non-human animals are included in the victim category, there is still the problem of harm to species and ecosystems. Those responsible for the eradication of a species, for instance, do not necessarily victimize the individual members of that species. Despite the above conceptual complications, it is easy to assume that, after successful remediation efforts, and after restitution has been paid to victims, the polluting company has repaired the wrong and made the world whole again. Talk of repairing nature to its original state is what gives rise to the baseline problem.

When intermingled with practically irreversible global climate change, the baseline problem introduces the challenge that under no circumstances will we ever be able to return an ecosystem to an initial baseline state. Since we will never be able to return an ecosystem to its original state, we cannot possibly have an obligation to do so. While one could argue for some kind of restitution for the loss of the original ecosystem, the baseline problem is potentially crippling for the argument from reparation.

Complications in practical contexts

There are more practical worries about the baseline problem as well. For example, the US Endangered Species Act (ESA) imposes legal obligations to save endangered species. In addition to the requirement that the species themselves be preserved, the ESA requires that managers designate and preserve critical habitat *so that* the species be preserved. As the climate changes, such habitat may no longer exist. In some cases, the only way to prevent extinction for a species without a viable habitat is to assist their adaptation, be it in the form of relocation or habitat manipulation (Shirey and Lamberti 2010).

Traditionally, ecologists have thought of ecosystem states as changing with other conditions in a linear manner. If the conditions change, the ecosystem state can and will follow. The change could be a constant, gradual shift (Figure 4.1a) or a more drastic shift (Figure 4.1b), but both shifts might still be reversed just by reversing the conditions that gave rise to them (Scheffer *et al.* 2001). For example, a global temperature increase may cause the ecosystem state to degrade, but lowering the temperature back to the historically "normal" level would permit the ecosystem to improve back to the previous state.

Resilience theory suggests something more startling. Tipping points, or "ecological surprises," caused by climate change, may shift ecosystems to an "alternative stable state" (Paine *et al.* 1998). If this happens, returning the ecosystem to the previous state is all but impossible. In this case, an ecosystem state may suddenly shift to an entirely new stable state (Figure 4.1c). It may no longer shift back to its baseline. With a change in conditions such as temperature (and perhaps with extensive assistance), it may find a new stable state, even though little else may have changed. This existence of two stable states under the same parameters is called hysteresis (Scheffer *et al.* 2001). Climate change will bring about many such cases of hysteresis, resulting in an inability to appeal to a baseline as any sort of adaptation goal (Fox 2007).

Plainly, assisting with the adaptation (via corridors) of a species or an ecosystem when there is opportunity for the species to migrate or for the ecosystem to shift is a challenge in itself, but the pika case emphasizes the extent to which resource managers will need to assess what sky island ecosystems are to be recreated in the name of adaptation, and what to do when a species cannot move itself (Camacho 2010; Lawler and Olden 2011; McDonald-Madden *et al.* 2011).

Assisted environmental adaptation may provide a tool to help save some of those species, processes, and ecosystems. Such assistance might include the creation of corridors allowing nature to adapt in various ways; though it may also include more direct help, such as managed relocation or environmental modification. Adaptation efforts may seek to preserve some state of affairs that is similar to the way things are now; but, in all likelihood, adaptation will be more complicated than this. Adaptation must be dynamic. It must change with the changing climate. It must be versatile. It must be guided by rational and reasonable discourse (see also Chapter 3).

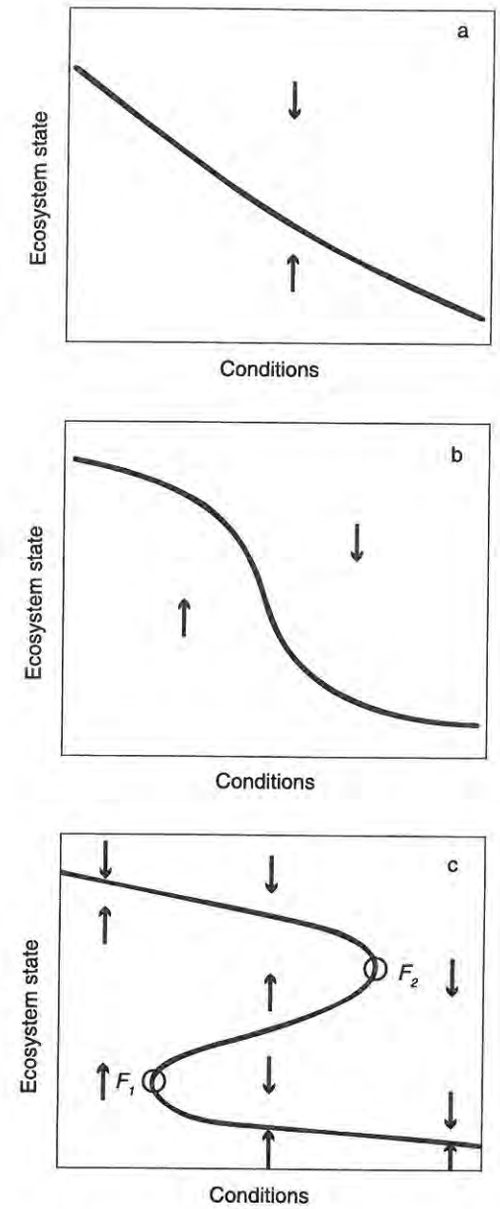

Figure 4.1 Three modes of ecosystem change.

Source: Adapted from Scheffer *et al.* 2001.

Note: Ecosystems can change in one of several ways: in a constant, gradual manner (top panel, 4.1a) or through a more drastic shift (middle panel, 4.1b), in both instances retaining the ability to reverse the change if causal forces are reversed. When an ecosystem suddenly shifts from one state to an entirely new stable state without the ability to return to a prior condition or an historical baseline, it is said to have passed a tipping point (bottom panel, 4.1c).

For humans, by humans

Consider for a moment the 1972 cult classic *Silent Running* (Turnball 1972). In the film, we learn early that eight domed spaceships orbit the planet Saturn. Each dome harbors one of several unique ecosystems of Earth, ranging from tropical forests to grassy plains. These ecosystems are the last remnants of an earlier time on Earth, before the entire planet was shorn of its natural areas and brought under the total control of man. On the spaceship *Valley Forge* – one of the eight ships in the fleet and the ship on which most of the action occurs – a subtropical forest ecosystem is tended by a small staff of humans and robots. Freeman Lowell, astrobotanist and adaptation advocate, tends the species and subsystems contained in these domes to preserve them for future generations and the eventual reforestation of Earth.

Early in the film, the crew receives orders to jettison the domes and destroy them. What ensues is a discussion about the value and importance of these ecosystems, as well as some attempt to justify either the preservation or destruction of them. A full recapitulation of the film is not critical to this discussion. Rather, it will be helpful to address the various reasons that each worker gives for preserving and/or destroying the forest. Most of these reasons are given as the four spaceship workers sit around the kitchen table and discuss the pluses and minuses of a cantaloupe that Lowell himself has grown.

From this conversation we learn, essentially, that the reason for the eco-domes is that the Earth has been modified. In a massive, global-scale social improvement project, Earth has been summarily stripped of its wildness. The terraformed planet is now temperature-controlled to a comfortable 75 degrees across its surface. In what appears to be either a last-ditch preservation effort or a clever Machiavellian ploy to distance the people from their wildlife, the forest ecosystems have been relocated to a fleet of spaceships and sent into orbit around the sixth planet from the Sun.

This new, modified world is the source of the divide. According to Lowell, it's a homogenous and uninteresting place: "everything is the same, all the people are exactly the same," he laments. He complains that the food they eat is dried and synthetic, a position made all the worse by the fact that most residents of the planet do not seem to mind. One of his fellow cosmonauts, however, defends the dramatic project: "There's hardly any more disease, there's no more poverty, and nobody is out of a job." According to Lowell's compatriots, the loss of nature is nothing to bemoan. The Earth now is better than it was before, when food needed to be grown in dirt!

Lowell objects powerfully: "Every time we have the argument you say the same three things to me; you give me the same three answers." These answers, and Lowell's response to them, we believe, are key to dissecting this scene, and also to understanding the cross-cutting undercurrents of adaptation strategies. The workers' arguments are (a) health-related: that there is hardly any more disease; (b) welfare-related: that there is hardly any more poverty; and (c) self-actualization-related: that everybody has a job. Lowell objects to this life, which he deems deeply

deficient. Sure, they have all these things but "there is no more beauty, no more imagination, and no more frontiers left to conquer." In response to his compatriots, he offers an explanation for this: "Do you know why this is?" he asks. "One reason," he emphasizes, "One reason: The reason is . . . that nobody cares."

So we are then left to interpret this statement: What does it mean to care about nature? What does it mean to care about future generations? Consider the possible views on what it would mean to care about nature, taken in part from the above conversation.

Variation 1: value

Lowell is concerned about what will happen if these forests and their incredible beauty are lost for all time. At one point, he mentions that the food he picks has a taste, a color, and a smell, all of which his compatriots on the ship find to be inconvenient annoyances. He wants to call back a time when there were mountains and valleys on the Earth instead of the monotonous uniformity that prevails today. Essentially, his argument for the preservation of the forests rests in their value. His particular position seems to emphasize beauty and other aesthetic features of nature, but it is no stretch to attribute to him an intrinsic valuation position as well. Plainly, these value-oriented arguments offer some of the core justifications for proceeding with assistive adaptation projects such as assisted colonization (Sandler 2009) or managed relocation (Richardson *et al.* 2009). Yet, they are also subject to the varied rebuttals of his interlocutors. Health is improved. Welfare is improved. Everyone has a job. It seems perhaps to be a better world. At least, this much is debatable.

Variation 2: virtue

Lowell likes his cantaloupes and identifies the difference between naturally grown food and the processed food that his compatriots eat as resting on the fact that he grew the food himself. As he says: "I picked it and fixed it and it has a taste and it has a color." Lowell worries that future inhabitants of the Earth will never have the opportunity again to feel leaves in their hands, or to lie in the grass and stare up at the sky. The thought here, of course, is a familiar one to restoration ecologists: that the process of restoring nature, of bringing something to life, engages a kind of valuable self-actualization process; a process that brings people into a closer relationship with nature and builds community (Light 2002; Light and Higgs 1996). The irony of this state of affairs and Eric Katz's objections to restoration ought not to be lost here. Katz (1992) objects strongly to some restoration projects, claiming that restoration can lead humans to believe that we can wrest more control over nature than we actually can.

Variation 3: care

Lowell's concern that "nobody cares" clearly raises the prospect that his compatriots are overly rationalistic and disconnected from a more fulfilling relationship with the forests. Such a view echoes the ethical stance emergent in the work of ecofeminists such as Marti Kheel, Karen Warren, Deane Curtin, and Val Plumwood. An ethics of care stems from the seminal feminist writings of psychologist Carol Gilligan, and essentially suggests that a consideration for the needs, interests, and equal standing of others emerges out of our relationships with the natural world (Curtin 1991; Gilligan 1993; Kheel 2008; King 1991; Plumwood 1991). Again, this interpretation may resonate with what Lowell is suggesting to his compatriots, but Lowell seems not to apply such care to humans and non-human nature in equal measure. He kills his compatriots in order to preserve the forests.

Variation 4: justification

As mentioned, the fleet receives the order to jettison the domes and destroy the forest ecosystems. The ships carrying the domes, we are told, are to be returned to commercial service. This position has presumably been considered by the military, though no further explanation for the decision is given.

In response to the order, Lowell shouts that such a view is "insane." With little information about the wider context in which such forest destruction is to take place, viewers are inclined to agree. It does seem insane. Given what we know about forests as self-contained systems, and given what we are led to believe about the viability of these ecosystems within a dome environment, it seems plausible to all but the most myopic that there is at least some middle-ground solution – some alternative solution that would not forever destroy the forests.

Maybe the ships can be returned to service through some other means. Maybe the forests can be preserved simply by relocating them to another planet. Maybe they can be set free to drift in space on their own. We don't know, but we are invited to conjecture.

What seems insane about the military's command to destroy the domes, then, is the profligacy of the act. It seems an un*considered*, un*necessary*, un*justifiable* waste of the forest ecosystems, particularly when there are ostensibly so many other avenues that the military could have pursued. Jettisoning the domes into space and leaving them to themselves would have been, perhaps, a far more justified position. We are led to believe this not only by Lowell's initial reaction at the beginning of the film, but also by Lowell's action at the end of the film [SPOILER ALERT!], when he kills himself and jettisons the last dome to float off on its own.

The scene offers a critical moment, and a vital insight, for species and ecosystem adaptation, though perhaps one that will be too thin for the average environmentalist. What will or will not make the jettisoning of the domes justified is not whether, on balance, one set of values outweighs another; nor is it simply whether there will or will not be a reconnection with the Earth and the wider ecological community. Rather, what will make the jettisoning and destruction of the domes justified is whether a compelling set of reasons – a rationale – can be given that authorizes or permits their destruction. What is needed, in other words, is not a specific set of reasons and values, but rather a flexible but reliable method for determining whether the set of reasons does the work of justifying the act.

Viewers are never given a good reason as to why the domes should be jettisoned, and so we are left to side with Lowell. Had a good reason been given, we might be swayed to side with the others.

Successful adaptation

There are obviously many reasons for preserving nature through adaptation. It is beautiful. It is valuable. It is important to us. And, of course, we humans are mostly responsible for bringing large swaths of it to a premature end. Our collective responsibility for climate change suggests that at least this much is true. What it means to "repair the damage," however, is what is challenged by the new baseline problem. Our thesis is that substantive adaptation obligations, whatever they are, can only ever be identified by subjecting each assistive adaptation project to the scrutiny of a wide deliberative community of affected parties and establishing what is reasonable, not what the baseline is. Such a deliberative community must either acknowledge and then justify allowing some extinctions or loss of habitat; or decide that it is right and good to, say, help the Great Basin pika adapt.

Successful adaptation cannot necessarily require that we maintain the pika ecosystem as it currently is; nor can it require that we ensure the long-term survival of the Great Basin pika subspecies. Our substantive obligations, whatever they are, must instead be understood as derivative from reasonable and rational deliberation. For example, adaptation of an ecosystem, in this sense, requires resilience, not only of the ecosystem, but also of the Earth's varied citizens. In addition, successful adaptation requires a procedure permitting the justification of environmental harms and benefits, rights and wrongs, through an open and honest process of deliberation that includes experts, managers, and proxies for nature.

What such an adaptation strategy will ultimately look like will depend, in large part, on the decisions emerging out of this justificatory process. It will likely vary from ecosystem to ecosystem, based on a multitude of factors including costs, benefits, intrinsic and extrinsic values, timelines, feasibility, and acknowledgment of the interests of relevant parties, and so on. Only when all reasonable avenues and challenges have been pursued and considered can assistive adaptation managers claim that their actions taken on behalf of nature, in the name of assisting with ecosystem adaptation, are justified.

It is thus vital that researchers begin now creating the management infrastructure to accommodate and support such deliberation in practice. Indeed, many have already begun this process, but such efforts have tended to seek a rigid middle ground – a compromise solution between those who prioritize the species, the ecosystem, or both (McLachlan *et al.* 2007). Many seek to balance retrospective

baseline-related considerations with prospective forward-looking considerations by laying out a framework, but such approaches may be undermined by their appeal to the past for future states of value (e.g. Magness *et al.* 2011; Maschinski *et al.* 2011). Moreover, many do already acknowledge the need for wide input from a range of affected parties, but the policy- and decision-making channels for such deliberative input must be built now, in concert with the ecological and management research. This deliberative approach, provided that the channels for deliberation are kept open and free, is the best hope for the isolation of priorities and methods that are suited to any given situation, though it is important not to fetishize the justification procedure. Priorities and methods, given the nature of the deliberative framework, must always remain open to further revision.

Discussion

The preceding analysis raises several issues for further discussion. First, some might disagree that the argument from reparation offers a compelling reason to assist in the adaptation of nature. We contend that the argument from reparation offers perhaps one of the strongest reasons to assist in the adaptation of nature. If the pika is threatened with extinction due to natural climate variability, it is not clear that we should assist in their adaptation. How strong, after all, are our obligations to move wildlife if a tsunami, or a volcano, or a hurricane threatens their well-being? In such cases, we require different reasons to justify intervention. It is well accepted that climate change is primarily an anthropogenic phenomenon. Inasmuch as the human community has brought about recent climate change, the human community bears special obligations to reduce the harms stemming from it. The argument from reparation serves to strengthen the obligation to relocate or assist species in adaptation.

Another issue arises around the question of how to compare and evaluate or prioritize among different values. Maybe Lowell's counterparts on the *Valley Forge* are correct. Perhaps a world without disease and poverty is preferable to a world with beauty and nature. Perhaps the benefits of development and the costs of adaptation are greater than the cost of losing species and ecosystems to climate change. But as viewers we are not privy to reasons that help us understand how such benefits could outweigh the costs. We are left out of the justificatory process. Without access to the full suite of reasons that might weigh one way or the other in favor of such drastic action, we are left to fill in the justificatory blanks.

Still others may worry that our justificatory requirement may obligate us to adapt too much (e.g. Sandler 2009). Our approach does not call for assisting in the adaptation of everything. In fact, it may call for assistance in only a few instances. Deliberative engagement between ecosystem guardians, experts, and managers will reasonably avoid overcommitment in any pragmatic implementation of our approach. If all relevant parties are engaged, there will likely be some agreement, some convergence, on those issues, individuals, species, or areas that are morally salient and those that are morally irrelevant. The conundrum here is that moral

systems that privilege individuals, or species, or even ecosystems essentially leave little choice but to preserve those things of value or with status. Turning attention away from value or status and on to the justificatory validity of the positions avoids the above demandingness objection.

Finally, a procedural approach is thought by some to be morally thin. Critics may argue that our solution merely side-steps issues of value, considerability, and so on. This objection relies on the claim that procedures alone cannot guide decision-making: bad reasons may proliferate and be used to justify bad actions. We readily admit that this is a conceivable implication of our view. However, provided that the justificatory process is open and honest, provided that the procedure leaves space for revision, we trust that better solutions and actions will emerge from the ongoing dialogue. In the case of assistive adaptation, the extinction of the pika, or perpetuated harms to nature caused by climate change, will only be morally justifiable if good reasons can be defended. This does not side-step the question of value, but allows for discursive deliberation on the matter to determine the moral relevance of certain values to a particular case.

The essentializing impulse of ecological management – that is, the emphasis on the good of an individual, a species, an ecosystem, a phylogenetic clade, etc. – proves both practically challenging and theoretically worrisome (Holling 1973). As the climate changes, everything else will also change, including our management strategies, our science, and our approaches to sustainability (Hulme 2005). Our moral presuppositions and our ethical decision-making apparatus must be adaptable as well. We must, in other words, approach the moral problem of adaptation from a vantage that itself is adaptive.

Conclusion

Because climate change will alter the global environment – displacing species, fundamentally changing ecological relationships, and, in many, if not most, cases, removing the possibility of restoration – assistive adaptation may be required. Our thesis provides a rationale for understanding obligations stemming from anthropogenic degradation as duties of reparation. We elide the baseline problem by emphasizing instead the justifiability of an action rather than the value of this or that species or ecosystem.

If it is true that we are morally culpable for the environmental changes underway, and we believe we are, we propose that our culpability rests in our repeated failure to justify our consumptive actions and the losses associated with them. Not all of our actions, to be certain, but many of our actions. If the pika are fated to disappear due to unjustified prior human actions, then we argue that we may still have a restorative obligation to assist them in adaptation even though there may be no baseline back to which to restore. The approach we offer suggests that our responsibility to the non-human world now and in the future hangs on the unjustifiability of our actions today. It is thus independent of such historically contingent views of the "natural." In order to right these wrongs of justification, we must ensure that all forward-looking actions can be justified.

This will require, then, that affected parties – experts, citizens, stakeholders, proxy representatives – work together on an adaptation strategy. Only an open deliberative framework can lay the groundwork for a fair and just decision over what kind of adaptation assistance to undertake.

Assistive adaptation will certainly require revising historical paradigms and presuppositions, within ecology but also within ethics. Total reparation to a previous natural state will be impossible without turning back the clock on climate. Therefore, our obligations can only possibly be fulfilled by ensuring that the adaptive measures that we do take are justified.

Notes

1 However, the application was denied. See: http://www.fws.gov/news/NewsReleases/showNews.cfm?newsId=9ED1C504-E57E-3694-99BB229A32914B37 and http://www.biologicaldiversity.org/news/press_releases/2010/pika-02-04-2010.html.
2 Some ecologists use "assisted migration" to refer not to the literal relocation of populations, but instead the creation of corridors allowing the species to move themselves. See: http://e360.yale.edu/feature/as_climate_warms_species_may_need_to_migrate_or_perish/2142/.
3 One referee rightly points out that there is a potential equivocation between uses of "justified" here. Building on the work of Jürgen Habermas, we are using "justify" in a pragmatic sense, to refer to discursive practices of justification and not to the state of being true or right (Habermas 2003).
4 The royal we here refers to humanity as a collective.

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5 REDD+ and social justice

Adaptation by way of mitigation?

Heike Schroeder and Chukwumerije Okereke

Introduction

Mitigation and adaptation to climate change are still largely approached as separate types of activity. We examine here the case of Reducing Emissions from Deforestation and Forest Degradation (REDD+) given its relevance for both climate change mitigation and adaptation. This evolving mechanism as part of a post-Kyoto agreement under the United Nations Framework Convention on Climate Change (UNFCCC) expanded in 2009 from an earlier narrower focus on deforestation and degradation (REDD) to also include conservation, sustainable forest management, and enhancement of carbon stocks, which is what the "+" in REDD+ now stands for (Campbell 2009). The aim of this chapter is to examine the social justice dimensions of REDD+ and how these complicate our understanding of successful adaptation.

Although REDD+ was initially framed and designed to be a mitigation opportunity for developed and developing countries, limitations in available funding and other competing priorities – above all, adaptation to climate change in developing countries – have brought up the idea of REDD+ as an adaptation program (Long 2009). Attempting not only to achieve climate mitigation and poverty reduction, but also to build resilience to the impacts of climate change is now being referred to as "triple wins" (Mitchell and Maxwell 2010). An example of a synergy of adaptation and mitigation objectives is that protecting forests through REDD+ can provide a form of insurance in that forests can act as natural safety nets for poor households, which can turn to forests for sustenance and income in the face of external shocks (Campbell 2009). A number of approaches building on such synergies are currently being developed, including "climate compatible development," "climate smart agriculture," or "ecosystem-based adaptation."

Ecosystem-based adaptation is based on the notion that societies derive benefits from ecosystem structure and functions. Ecosystem services yield human well-being through 1) provisioning (e.g. fuel and food); 2) regulating (e.g. water filtration, climate); 3) cultural (i.e. recreation, aesthetics, education, and spiritual meaning); and 4) supporting services (e.g. nutrient cycling) (MEA 2005). Changes in climate will make it increasingly difficult for local and indigenous people to