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A Just Transition to Climate-resilient Coastal Communities in Aotearoa New Zealand

Abstract

Even if global emissions of greenhouse gases were to fall to zero immediately, still we would expect significant sea level rise over the next half century, along with increased frequency and intensity of inundation events and coastal erosion. While this fact has been widely appreciated by public servants and policymakers, the ethical implications and distributive consequences of our climate adaptation policy decisions have not. Decisions to allow new development in areas likely to become uninhabitable could transfer investment risks from property owners to the public, for example, while decisions to relocate existing at-risk communities could disempower already relatively disadvantaged groups. A just transition to climate-resilient coastal communities will require reduced policy uncertainty and enhanced democratic decision making.

Keywords just transition, sea level rise, climate justice, climate change adaptation, climate ethics, decision making

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Climate change is already affecting coastal security (among other things) in Aotearoa New Zealand. However, given that the sea level is rising at an ever-faster rate, we can anticipate that the rate at which adverse events occur will rise over time as well, leading to increasing political salience as well as material and other losses (Climate Change Adaptation Technical Working Group, 2018). The most important thing to understand about the risks associated with sea level rise is that a significant amount is already locked in; in other words, even with no additional greenhouse gas emissions (*per impossibile*), the sea level would continue to rise for a long time. For Aotearoa New Zealand, this means that with no further greenhouse gas emissions worldwide we would still expect an eventual 1.6–1.7m of sea level rise, but the less we emit from now, the longer it would take to reach an eventual equilibrium (Bell et al., 2017). We cannot prevent sea level rise from occurring, but mitigation can slow it down. Emissions

reduction and adaptation mutually affect each others' ranges of possibility such that they are better conceived together, from a just transition perspective, as climate action (Frame and Reisinger, 2016).

The IPCC (2018) report on the importance of limiting the rise of global mean temperature to 1.5°C above pre-industrial norms noted that if this ambitious target is met, models predict a rise of between 0.26 and 0.77m by 2100. The same report cautioned that instabilities associated with the possible loss of ice sheets in the Antarctic or Greenland could lead to much higher rises in sea level. Clearly we should presume both of the following propositions: first, that the specific circumstances for which New Zealanders must plan are difficult to predict; and second, that increases in the frequency and intensity of sea level rise-related adverse events over the next half century (at least) are nearly certain to obtain. In short, we know the direction, if not the rate or precise orders of magnitude, of change to expect.

The Ministry for the Environment's guidance for local government notes that climate change is interfering with settled norms about planning:

The community anticipates that the land along the coastal margin will persist permanently, and that those living there will be safe from natural coastal hazards (apart from rare tsunami or storm events). Sea level rise from climate change challenges this perception. (Bell et al., 2017, p.17)

A cautious estimate of at-risk populations and property commissioned by the parliamentary commissioner for the environment estimated that at least 3% of the people in Aotearoa New Zealand and many tens of thousands of buildings, along with at least five airports and thousands of kilometres of roads, would be affected by up to 1.5m of sea level rise (Bell, Paulik and Wadhwa, 2015). A few years later, Local Government New Zealand estimated that the replacement cost of three-waters pipes alone would be \$1.6 billion at a metre of sea level rise (Local Government New Zealand, 2019, p.9). At only 0.3m of sea level rise (and thus at a level already locked

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in and probable over the next half century), more than 4,000km of three-waters infrastructure pipelines are exposed to risk, along with nearly 70,000 buildings, according to a NIWA report commissioned by the Deep South Challenge (Paulik et al., 2019). Even in the nearer term, over the next 20 years, we can expect sea level rise and its concomitant risks to lead to insurance retreat for more than 10,000 homes in Aotearoa New Zealand (Storey et al., 2020).

Pipes, roads, buildings, infrastructure, and the residents who collectively use those resources to interact with one another comprise communities that are expected

to last indefinitely. In the context of climate change, however, regular maintenance of the kind that repairs ageing infrastructure or expands service to new populations will fall far short. The adaptation options facing at-risk communities in Aotearoa New Zealand over the rest of this century range from minor engineering to nature-based solutions all the way through to major engineering and managed retreat (Lawrence et al., 2020; Bell et al., 2017). Continuing under business as usual is not an option for at-risk communities.

These new circumstances undermine the conditions under which New Zealanders interact with one another in relative safety and fairness; the challenge of climate adaptation threatens to exacerbate existing injustices and to create new ones. The losses arising from sea level rise are foreseeable: even if we don't know the exact rate of acceleration of risk, we can be reasonably certain that vulnerable properties will eventually lose value (Tombs et al., 2021). As if the societal stressors based on changing physical circumstances weren't severe enough, they are compounded by policy uncertainty. In what follows I identify some specific injustices that arise from policy uncertainty in the context of sea level rise. I then recommend some policy responses that would allow interaction even in a context of adaptation to climate change – which is to say, even in a context of persistent 'deep uncertainty' – to proceed with sufficient security and fairness (Marchau et al., 2019).

Just transition and climate action

'Just transition' has evolved from conceptual roots in the labour and environmental justice movements into a mandate for societies to mitigate and adapt to climate change while reducing inequality and promoting justice (McCauley and Heffron, 2018; Pinker, 2020). Just as 20th-century efforts to do right by workers and communities transitioning from highly polluting industries used the idea of just transition to express intuitions about burden sharing, protecting the least advantaged, respecting local agency and sustaining environmental values, so present-day just transition efforts seek to ameliorate existing injustices while avoiding introducing new ones.

The ideal of a just transition is simultaneously strategic and normative. It is strategic insofar as it expresses the political insight that attempts to transition at the expense of particular sectors or social groups are likely to be self-defeating (Gambhir, Green and Pearson, 2018; Broome, 2010; Frame, 2019). The ideal of a just transition is normative insofar as it rejects centuries of moral irresponsibility regarding the costs of transformation (Polanyi, 1985; Bainton et al., 2021). In committing to the ideal of just transition, states, intergovernmental organisations and non-state actors are embracing their collective responsibility for climate action and its human and environmental consequences (Boston and Hall, 2019).

The world has set itself the task of transformation to a low-emissions economy over the next half century or sooner, in order to avoid the worst consequences of climate change (IPCC, 2018). Though the earth system transformations set in motion by industrialisation will continue far beyond the next 50 years, we are experiencing many of these changes already in the form of weather extremes, sea level rise, ocean acidification, and other departures from the physical conditions in which human societies have traditionally thrived (Steffen et al., 2018; IPCC, 2014).

Societies transitioning to low-emissions economies are operating in rapidly changing conditions characterised by difficult-to-specify feedback loops and tipping points, even as the overall direction of change is well understood (Lenton et al., 2019). This means that siloed decision making about transitioning for climate mitigation, on the one hand, and about adapting to climate change, on the other, is subject to predictable and avoidable errors, such as maladaptive decisions for new low-emissions enterprises or adaptive strategies that compound climate risk. Just transition efforts must aim at holistic climate action, transforming society for climate resilience and for minimal or positive climate impact.¹ Just transition in the 21st century must be conceptualised as realising justice in *climate action* and not just emissions mitigation; siloed thinking is no longer an option if we would transform societies

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towards sustainability and justice (Atteridge and Strambo, 2020).

Among the most basic intuitions associated with just transition is the ideal of a social contract. People expect that if they adhere to ordinary societal norms in their efforts and interactions (working hard, playing by the rules, and so forth), the state will ensure that they are able to interact under conditions of reasonable security and mutual wellbeing. People need to be free to undertake the individual and cooperative actions that lead to their thriving in safety, and they cannot ask the permission of everyone affected each time they engage in other-affecting action (especially since many of those people have not yet been born). Instead, people rely on a more or less informal social contract to provide the rules under which they can presumably (if imperfectly) interact without wronging each other. In transitions that have come to be seen as unjust, workers and communities have worked hard and played by the rules, and nevertheless lost the conditions under which they could thrive in safety; this loss undermines people's faith in critical background rules understood as the social contract.

Modern industrialised democracies feature systems oriented towards the realisation of this common view of the social contract as guaranteeing fair and relatively low-risk interaction (Ellis, 2006). State-regulated systems of money and law work in the background of the innumerable interactions that make up our vast, anonymous trading societies, limiting our exposure to risk and ensuring that we can claim that our winnings (or losses) count as our fair share. Of course these systems are wildly imperfect, but we rely on them nonetheless. Without rules of the game underwritten by the state, we would be left to manage our interactions on our own, and we would all be much less well off.

State regulatory systems must constantly adapt to new societal circumstances in order to retain their legitimacy by performing this background underwriting of the rules that allow us to interact with manageable risk and sufficient fairness. New challenges – changes in the circumstances of ordinary interaction – can open up gaps in the rules that increase risk and undermine fair play.

The imperative of just transition to climate resilience is just such a challenge. People experiencing the societal transformations associated with climate change rely on general rules governing their interactions to ensure that decisions they make and the actions they take are consistent with the commonly accepted rules of the game. Whether the rules aim to reduce emissions or to adapt to climate change-driven circumstances, what matters most for achieving a just transition is that they are *certain*, so that people making decisions can be assured that the state has ruled out decisions that violate the social contract. Many different policies on climate action would provide this kind of societal certainty, regardless of the policies' specific contents. But when policy uncertainty under changing climate conditions calls the rules themselves into question, people can no longer rely on the social contract to guarantee their collective and secure thriving together.

Thus, a holistic conception of just transition for climate action should guide our understanding of the strategic and normative challenges of adapting to sea level rise in Aotearoa New Zealand. Without attention to the need for policy certainty that underlies

fair interactions (and other critical elements of just transition, such as community engagement), New Zealanders transitioning to a low-emissions, climate-resilient society risk exacerbating existing injustices while introducing new ones. The next two sections of this article examine a particularly trenchant challenge for Aotearoa New Zealand from the perspective of just transition: adaptation to rising sea levels and increases in the frequency and intensity of events like erosion, inundation and intrusion that accompany climate change.

How new development in areas subject to sea level rise transfers risk to the public and to future generations

The first climate adaptation challenge for a just transition in Aotearoa New Zealand has to do with risky new development; I discuss the second challenge, having to do with at-risk existing development, in the next section.²

In 2014, 81% of New Zealanders surveyed by the University of Auckland affirmed that climate change is real, with 69% affirming that climate change is caused by humans (Milfont, Wilson and Sibley, 2017). Certainly we should be able to presume that from that date forward, if not earlier, understanding climate risk would be an aspect of due diligence on the part of everyone who invests in property at risk of coastal erosion, increasingly frequent floods, water table rise, saltwater intrusion, or other consequences of climate change.

However, we are not seeing signs of due diligence regarding climate risks affecting new property development (Stewart, 2021). Instead, prices of coastal property are rising, and both public and private investors are busy adding value to properties that at best will require expensive engineered defences and infrastructure support, and at worst will have to be abandoned and replaced with more climate-resilient public amenities like wetlands. At present, local government can refer to guidance from central government and to the New Zealand Coastal Policy Statement; these offer recommendations that risky new development be avoided. However, in the absence of uniform rules that would remove the uncertainty about responsibility for eventual sea level rise-related losses, development of at-risk areas is ongoing

From a strategic perspective, the status quo in the rules governing risky new development incentivises free-riding: under present conditions, a rational investor will seek to realise the gains available from adding value to risky but desirable coastal properties while transferring the losses of such investing to the public.

(Iorns Magallanes and Stoverwatts, 2019). A market that distributes investment resources irrationally, both in time (developments will not last their expected span) and in space (they are built in risky locations), cannot fulfil the expectations New Zealanders have that the state will ensure fair and secure interactions. As we shall see, these market failures signal policy uncertainty: a gap in the rules governing our interactions in the area of risky new development under conditions of climate change.

Our common (if usually tacit) background understanding of the Aotearoa New Zealand social contract supports an investment context in which private insurance prices the risk of unpredictable natural hazards, while government evaluates and mitigates foreseeable natural hazards; banks are expected to factor risk into their lending behaviour, as are individual investors (Lawrence et al., 2020). Meanwhile, our collective memory and the shared value of solidarity incline us to presume that the state will offer assistance to those affected by natural hazards (Tombs and France-Hudson, 2018). Aotearoa New Zealand's institutional context reflects these histories and values: EQC makes sense to a country with very recent memories of traumatic earthquakes, not to mention landslips, floods and other natural disasters. How does climate change alter this set of institutions and expectations? The critical difference is this: we can now identify locations for potential development whose climate-related risks are well understood, but our background assumptions and institutions still treat them as if they were like the rest of Aotearoa New Zealand, subject to relatively unpredictable natural hazards.

This new information about climate-related risk, coupled with old institutions and norms that treat losses from natural disasters as especially deserving of solidaristic compensation, has altered the character of the way investors relate to society as a whole. The moral hazard of offloading risk to the public while retaining gains in private is, of course, ubiquitous; this is why we have excesses built into insurance contracts, for example. In this new case, however, investors find themselves playing what amounts to a game of 'chicken' with the public: they are betting that the state will 'swerve' in the event of large climate-related losses, providing compensation for property lost and damaged by natural hazards like coastal erosion or floods as if they were as unpredictable as earthquakes. However, in these new cases of developing land at risk due to sea level rise, the hazards are anything but unpredictable (Ellis, 2018).

Recall that the just transitions perspective is both strategic and normative. From a strategic perspective, the status quo

in the rules governing risky new development incentivises free-riding: under present conditions, a rational investor will seek to realise the gains available from adding value to risky but desirable coastal properties while transferring the losses of such investing to the public. Were we in a position to provide it, certainty about responsibility for climate-related loss would shift the strategic landscape from one in which investors are encouraged to transfer risks to the public to one in which everyone is encouraged to invest in less risky areas. From a normative perspective, under the status quo burdens are likely to be transferred to those less advantaged, and there is additional ongoing inequality related to variation in local government behaviour. Local government remains responsible for mitigating natural hazards and providing infrastructure even in areas known to be at risk of increasing inundation, coastal erosion and the like (Iorns Magallanes and Stoverwatts, 2019). Thus, an additional normative shortcoming of the status quo in development of at-risk areas is that it transfers burdens of responsibility to future generations of ratepayers (Boston and Lawrence, 2017).

How we make decisions about existing at-risk development affects both agency and equality

It is one thing to decide, in 2021, to invest a substantial sum of money in developing coastal property at risk of erosion and increasingly frequent and extreme inundation, hoping that Aotearoa New Zealand's tradition of solidarity in the face of natural hazards will mean that present and future publics will shoulder the burden of one's eventual losses. It is quite another thing to discover, in 2021, that the home one has inherited and the community to which one belongs are, through no fault of one's own, subject to serious and accelerating climate-related hazards (Tombs et al., 2021). The scale of the problem of at-risk existing development in Aotearoa New Zealand is staggering: previous efforts to support community relocation in the face of new natural hazards have addressed as many as a few dozen properties at a time; over the next century, many thousands of homes in hundreds of communities are at risk of

Normatively, our policies governing risky new investment and existing at-risk areas are likely to increase inequality and exacerbate societal divisions, while reducing overall wellbeing due to missed opportunities for proactive climate policy

becoming uninhabitable, and decisions will have to be made about what steps to take to address those risks (Bell, Paulik and Wadhwa, 2015).

Existing property at risk of inundation and other climate-related threats can be given protection in the form of hard engineering solutions like a sea wall, or in softer forms like restoring dunes or wetlands. Depending on the degree of risk (and, of course, on the emissions path taken collectively by humanity), these protections are more or less temporary. All coastal protection efforts have associated consequences. For example, building a sea wall to protect at-risk coastal property will lead to the loss of the beaches between the wall and the ocean, reducing the area's original amenity value while subjecting the wall to increased environmental pressure (Pilkey et al., 2016). Allowing property owners or coastal communities to make decisions about their protection from coastal hazards (say, by building sea walls) vindicates an important element of the ideal of just transition: the value of agency, or

having a say in the policies that affect you (Ellis, 2018). However, vindicating the agency of uncoordinated property holders along a coastline by allowing them to decide to build sea walls can lead to unintended collective consequences, such as the widespread loss of desirable amenities like access to beaches. Adaptation to sea level rise according to the ideal of a just transition should seek to accommodate both the value of local agency and the value of coordination to prevent unintended consequences.

To take a different example of the possible consequences of climate action for a just transition, retreat from an area of natural hazard can lead to a range of consequences depending on the principles instantiated in the transition. A common principle used to make decisions about protection of existing at-risk property is the principle of utility cashed out as market value. Standard cost-benefit analysis would prescribe that resources devoted to protection of an asset should be commensurate with the expected value of that asset over time. However, it should be noted that in practice the application of standard market valuation of at-risk assets will exacerbate existing inequalities in a way contrary to the principles of just transition. 'The rich get sea walls and the poor get moved' is not a principle that resonates with the ideal of a just transition, but it follows from the application of market-based risk analysis (Ellis, 2018). Thus, adaptation to sea level rise according to the ideal of a just transition will not only seek to accommodate both agency and coordination values, as mentioned above, but will also consider non-market values like social and community value (Orchiston and Stephenson, 2018).

Climate action for a just transition in Aotearoa New Zealand

As we have just seen, the status quo in climate adaptation policy in Aotearoa New Zealand is inconsistent with the ideal of a just transition. With regard to risky new investments, the structure of current incentives encourages free-riding and discourages the investments with the most long-term societal value. With regard to at-risk existing communities, the structure of current policies allows for some expression of local agency, but with little scope for the realisation of longer-run community and

national interests, and with little ability to recognise non-market values like the values embedded in existing communities. Strategically, our present lack of action in response to sea level rise undermines our capacity to reach the best and longest-lasting solutions. Normatively, our policies governing risky new investment and existing at-risk areas are likely to increase inequality and exacerbate societal divisions, while reducing overall wellbeing due to missed opportunities for proactive climate policy (Boston and Lawrence, 2017). Fortunately, there are solutions to these problems; even better, some of the best solutions are beginning to be put into place in pilot efforts around the country.

Policy for risky new investment

There is no universal 'right answer' to the question of the most just resolution of the trade-off between market value and social solidarity; national communities need to realise their collective commitments through legislation that expresses the right mix of subjecting investments to the risk-identifying discipline of the market and protecting people from the vicissitudes of nature (O'Neill and O'Neill, 2012). Whatever the correct balance for a particular country, however, that country will suffer injustice and disutility so long as there is uncertainty about which path it will choose.

The question of responsibility for property loss and damage from natural hazards brings this trade-off into sharp relief: who will be responsible for the losses when sea level rise makes coastal properties built in 2021 uninhabitable? The sooner we have an answer to this question, the more rapidly we can transition away from the policy status quo that now divides us. Whether we commit to a relatively solidaristic, EQC-like scheme of state investment for future compensation or to a more individualistic system of market-driven incentives, once we commit as a nation to things like universal rules limiting consents for risky developments, or a date after which subsidised insurance for risky properties will be limited (but see Boston, 2019, p.36), or some other device, we will have removed the policy uncertainty that is driving the injustice of our current circumstances.

As with policy solutions for risky new investments, in the area of protection of existing at-risk communities there is no universal 'right answer', but there are some promising options for balancing these values.

Another dimension of remediation for policy uncertainty is the timely and transparent provision of information. For example, prospective purchasers of properties should be able to learn about exposure to climate risk on their land information memoranda. Reliable information about risk would contribute to fair and secure relationships without the market and societal burden of information asymmetries; additionally, a uniform national context of the requirement to provide reliable information about climate risk would reduce incentives to make temporally and spatially irrational investments. An additional policy option that would have a similar market-rationalising effect would be the introduction of a land tax, either generally or specifically for at-risk and risk-adjacent properties. Land taxes reward productive investment in improvements while taxing away rents from unearned changes in value. As New Zealanders in at-risk areas come to see the prospect of managed retreat as increasingly likely, they could be subject to perverse incentives to invest in temporarily valuable assets such as adjacent properties likely to host retreating residents. Both

reliable information about policy contents and timelines and other measures like a land tax would increase the certainty that underlies fair and secure interaction.

Policy for at-risk existing communities

The problem of protecting existing at-risk communities from sea level rise and its associated hazards also involves negotiating a trade-off, but in this second case, rather than a trade-off between market individualism and social solidarity, we are concerned with a trade-off between local agency and national coordination. We can illustrate this trade-off if we imagine an engineer from Auckland or Wellington arriving at a provincial town threatened by coastal erosion and announcing that the long-run climate risks mean that local people must make expensive investments or even retreat from their community, and soon. The engineer is not technically wrong about climate risks, but the engineer's perspective in this imaginary example prioritises national-level coordination and long-term rational infrastructure investment over local values like fair distribution of climate burdens and enjoyment of their property over the next one or two generations. How can we address accelerating climate-driven risk without compromising local agency or national coordination?

As with policy solutions for risky new investments, in the area of protection of existing at-risk communities there is no universal 'right answer', but there are some promising options for balancing these values. As we saw above, uncoordinated local agents making decisions about protection from sea level rise can lead to unintended – and unfortunate and unsustainable – collective consequences. The solution to uncoordinated local agency, however, is not to reduce local agency, but to coordinate it. Individual property owners responding to uncertain mixes of market and regulatory incentives will not be able to protect their communities sustainably; we can see examples of this dysfunctional dynamic everywhere, from eroded beaches beyond private sea walls to the dispersed communities from the Lower Ninth Ward neighbourhood of New Orleans after Hurricane Katrina. However, local individuals and communities can exercise

agency in decisions about protection from climate risk through state-led processes of deliberation and engagement (Schlosberg, Collins and Niemeyer, 2017).

Here in Aotearoa New Zealand, local governments are experimenting with community-engaged climate risk deliberation. In the Hawke's Bay region, for example, councils and iwi have collaborated to create a sustained community engagement effort that connected local residents with technical and policy experts to make decisions about the method and timing of climate adaptation efforts (Lawrence, Bell and Stroombergen, 2019; Ellis, 2018). In coastal Dunedin, local government and community groups are collaborating to engage residents in decision making about coastal resilience, using multiple methods to reach the widest possible network, including online decision-making exercises, family-oriented events like print-making workshops, and meeting community members where they are with artwork, information boards and hui (Dunedin City Council, 2021).

Efforts like these can manage trade-offs between local agency and national coordination if they are supported with substantial resourcing and guidance from central government. Without those things, efforts to take timely action to prepare for rising seas and their consequences will depend on unevenly distributed local resources, and subject people to different levels of contribution and risk depending on their location. Moreover, substantial efforts to iteratively engage local residents in wrestling with the trade-offs inherent in climate action are likely to reach policy decisions that are sensitive to issues of justice (Dryzek and Niemeyer 2019).

Policy for just transition to climate-resilient coastal communities

As we have seen, the issue of compensation for losses associated with climate change is central to the issue of just transition.

At a fundamental level, just transition is about vindicating the social contract by leaving no one behind as we move to a low-emissions and high-resilience society. In Emmanuel Macron's France, the protesters of the 'yellow vest' movement rejected a petrol tax that was viewed as hitting ordinary commuters and rural residents while giving the biggest, wealthiest emitters a free pass. Similar rejections of policies perceived to transfer the burdens of climate action to the more vulnerable have occurred in Switzerland, Washington state in the US, and elsewhere. Strategically, for climate action to be perceived as part of a just transition, it must be perceived as fair; normatively, such action must not transfer the most risk to the least advantaged.

What compensation policy for climate-related loss and damage would satisfy the demands of just transition? As before, there is no single 'right answer' to this question. Instead, there is an imperative to eliminate policy uncertainty as far as possible, balanced against the imperative to preserve people's democratic agency in having a say in the policies that affect them. As Jonathan Boston notes, even with strong policy instruments like covenants or statutes meant to reduce moral hazard and provide certainty, there is nothing preventing groups from organising to alter the rules in their favour (and property owners are especially well placed to do that successfully) (Boston, 2019). Just as we will never be able to rely on the social contract perfectly ensuring that our interactions are fair and secure, so we will never be able to construct a perfectly just transition policy for climate-resilient coastal communities. We can, however, expect the state to act to reduce policy uncertainty while remaining responsive to changing democratic opinion about which values to emphasise in our decisions trading off among competing ideals.

With regard to compensation for climate-related losses, a policy aiming to maintain the market value of residential

property with a regime of compensation funded from general taxation (as recommended in Boston and Lawrence, 2017 and Boston, 2019) would resolve policy uncertainty without effecting transformative change: highly urbanised Aotearoa 2100 would remain a society of private homeowners, though those homes would be located in less risky locations. Alternative policies might target social and community wellbeing rather than residential market value in a compensatory regime, building climate-resilient communities that would serve renters and property owners alike. It is a matter for democratic decision making to select among these and other options; though, as we have already seen, business as usual is not among them.

A recent article surveying the global literature on implementation of pre-emptive managed retreat asks, 'What ... is the nature of the "social contract" between citizens and the state in the context of climate adaptation?' (Lawrence et al., 2020, p.67). From the perspective of just transition, the state must ensure, at a minimum, the policy certainty that allows New Zealanders to make decisions and take actions under conditions of security and fairness. How we transition from the present policy status quo of uncertainty and injustice in managing both risky new coastal development and existing at-risk communities will say a lot about what kind of social contract obtains among the people, present and future, of Aotearoa New Zealand.

- 1 What is more, successful climate action entails addressing interlocking sustainability crises simultaneously, including especially the biodiversity crisis. It is increasingly well recognised that nature-based solutions are among the most effective responses to excess emissions, as well as the ones that carry the most substantial co-benefits. See IPBES-IPCC, 2021.
- 2 For a more detailed explanation of the challenges associated with risky new development and at-risk existing development, see Ellis, 2018. For a detailed technical description of the distinction and its consequences for planning, see Bell et al., 2017. Here we ignore another category relevant to Bell et al. of risky new development that is not intended to be habitable, or is short-lived, or otherwise of low value and consequence.

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