

The dynamics of climate hazards

April 3, 2022

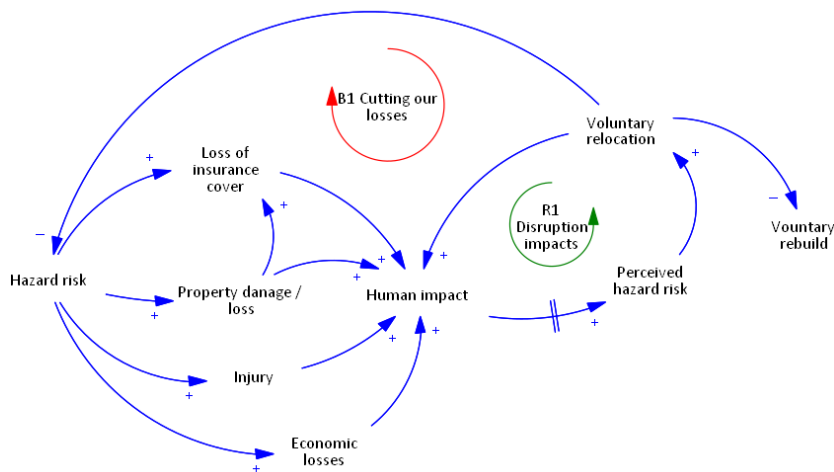
Bill Grace



Lismore floods - image from Australian Geographic

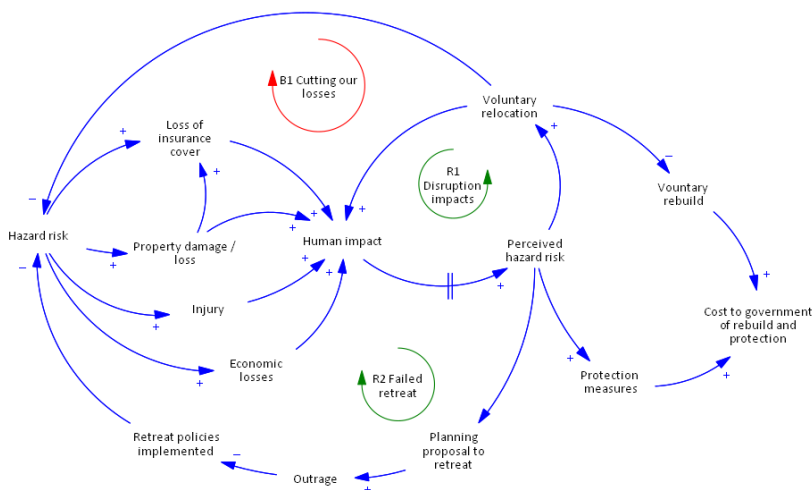
We know from the science that the hazards associated with climate change will only increase as temperatures rise. The IPCC Sixth Assessment Report tells us that even limiting temperature rise to 1.5°C (which is looking increasingly unlikely) will increase the frequency of extreme heatwaves, bushfires, and extreme rainfall events. Whatever happens with future emissions, we are facing worsening climate conditions and sea level rise, and in locations which are particularly sensitive to the changes, hazard risks will steadily increase over time. We are seeing one example of this with the floods in Queensland and northern NSW. Many locations are particularly vulnerable to sea level rise / coastal erosion, flood events, bushfires, drought, extreme heat and the human impact and economic losses associated with all those hazards. Here I consider a subset of these - bushfire, coastal inundation and flooding.

As these hazard risks grow there will be an increased frequency of events leading to injury, property damage and economic losses. Insurance for all these impacts in those locations will become increasingly expensive and potentially not available at all eventually. All of these factors cause physical and / or mental stress on the people affected, which is all we should really care about in the end. So how do people react to these events? When the frequency is low, people bear up, dig in and rebuild as we have seen in natural disasters past. However, as the frequency increases, people's perceptions will start to reflect the increasing risk and some will voluntarily relocate, thereby 'Cutting their losses'. In systems parlance this is a balancing feedback loop, meaning that an increase in the frequency of the hazard risk will eventually (with delay) lead to a reduction in hazard risk. However this process also has adverse impacts as people's lives are disrupted in increasing numbers ('Disruption impacts').

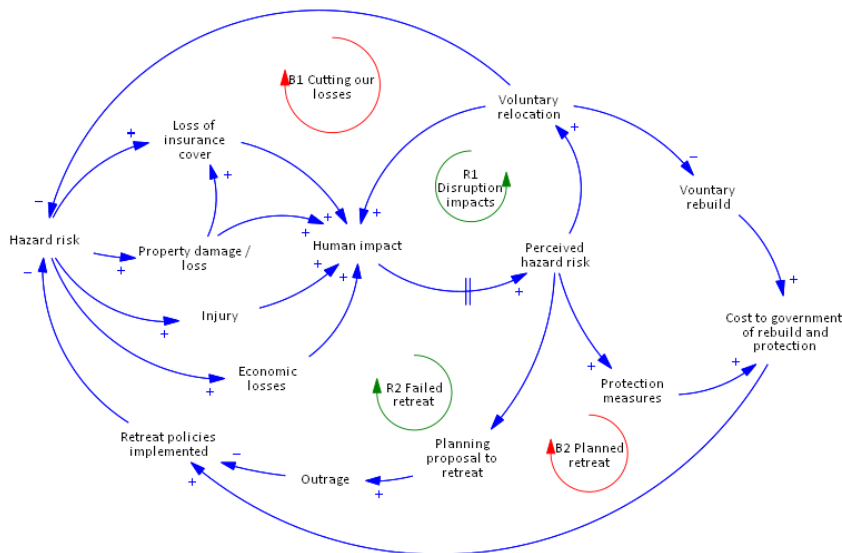


This is an uncontrolled process, leaving individual families to try to make the best decision at a time of stress, anxiety and financial loss. The traditional response of government is to assist people to clean up and rebuild, an understandable policy when hazards are infrequent. But we know their frequency will increase in the most vulnerable locations. So, what should government policy be?

Let's say in response to increasing impacts on people, and costs to government of re-building, planning proposals are developed to relocate an affected community. As we have seen with examples of properties affected by coastal erosion, this will result in outrage directed at government who allowed development in the first place and "should" (according to those affected) be footing the bill for rebuilding and / or ongoing protection (e.g. seawalls and flood defences). In many cases the outrage will succeed, leading to (at least) some backdown by government, allowing the problem to worsen - a 'Failed retreat' reinforcing feedback that will lead to greater risk and further impacts.



As hazards worsen and the costs to governments increase further, retreat policies will eventually have to be implemented ('Planned retreat') to avoid a 'blank cheque' response to rebuild and protection. This is the only sure route to reduce the various impacts on people arising from climate change in the most vulnerable locations.



All this is not to say that it is always wrong to rebuild and / or protect. It may well be sensible to put off retreat while the social, economic and environmental benefits of doing so outweigh the alternative. However, it is important to understand that any such action can only be an interim solution in the most vulnerable locations (i.e. where frequency x consequence will ultimately be too great to bear). Making that decision with imperfect knowledge will always be tough, and may look wrong if the weather gods hold off for a while.

While successful retreat strategies are rare, they do exist, such as in the case of the voluntary land-swap initiative by the Lockyer Valley Regional Council after the 2011 floods. There are also examples in earlier periods such as in Gundagai in 1852 after the Murrumbidgee breached its banks, a time perhaps when government was less concerned with public backlash than now. But it is important that government now step up given the scientific evidence of worsening climate change. The present focus is on resilience to events that are termed as ‘natural disasters’, by definition an occasional and unpredictable event. The impacts of climate change do not fit that definition so it is critical that we come quickly to the realisation that we are not just facing sporadic events but increasingly chronic climate conditions associated with fire, coastal inundation, and floods. While preparedness for such events can and should be improved, we also have to face facts that some parts of Australia will become uninhabitable, including where drought and extreme heat cannot be tolerated.

Where people live and work is controlled by Australia’s state and local government planning systems, and it is the planning systems that must respond to this difficult challenge. This means two things; firstly that it is up to government to direct the planning system to properly consider how and when retreat is to be implemented. Secondly, that government is ultimately responsible (albeit unknowingly) for the consequences of allowing development on land that is now vulnerable, and should bear the bulk of the costs associated with those consequences whether for rebuilding / protection or retreat. It is sadly the trade-off between the cost of those options, rather than the human impacts, that will probably lead to the retreat that will ultimately be inevitable in many locations in Australia.