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Short webinars for environmental policy-makers and practitioners

Targeting Vulnerability to Multiple Hazards in Pandemic Recovery

The following questions were asked during our live webinar with Suzie Greenhalgh, Nicholas Craddock-Henry and Patrick Walsh but due to time restrictions, we were unable to answer these in the session.

Are the ESVI based on 2018 census data?

The figures presented in the seminar and paper are based on 2013 data. The 2018 Census data are not released at the meshblock level (average size of 60-100 residents), but instead at the SA1 level (average size 100-200 residents). Due to this difference in spatial extent, we are currently exploring differences in the 2018 data.

Great use of combining data for multiple benefits, and great timing for COVID-19 recovery planning. Is it being used nationally, regionally, locally at the moment?

The ESVI presented in the seminar was based on national data. However, it is also possible to estimate a region-specific index, so that meshblocks are assessed relative to other areas within the region, instead of nationally. Please contact the authors if interested in region-specific indexes.

By building higher/better flood protection you are potentially encouraging intensification in areas that, should climate change move the goal posts, will become unsustainable in the future.

We agree that planning for the future must consider landscape factors alongside socioeconomic factors, especially in the face of sea level rise and other climate change impacts.

Maintenance cost for flood schemes need considering – if you end up in a dyke type situation due to sea level rise, the costs of constant pumping and maintenance may exceed the vulnerable communities ability to fund – don't encourage investment where the cost is going to escalate for future generations.

Couldn't agree more. The type of infrastructure (soft or hard) should be considered and this includes the costs now and those in the future. This is why we suggested green infrastructure be an option that is considered and can be deliver greater benefits. With sea level rise, managed retreat may also need to be a consideration as well.

Life expectancy of infrastructure needs to be considered vs degree of investment – making employment opportunities for vulnerable is a worthy objective, but better to have them working for something enduring rather than short term?

Yes, agree. Please see comment to the question above regarding soft or green infrastructure options.

While there could well be some areas that some additional flood protection works would assist, I think we need to be careful not to 'jump the gun' and not consider long term sustainability and planning responses. Some of these vulnerable communities may be better off undergoing managed retreat rather than protection in place. We need to sort out longer term planning before committing to a treatment response. Short term defend might be appropriate, but I am not sure we are there yet?

Yes, agree. Please see comment to the 2 questions above regarding soft or green infrastructure options.

Do the criteria for "shovel ready" projects include green infrastructure as a criteria and climate change impacts?

The original description was projects that are ready to go to boost employment etc. What we were suggesting is that there can be ways to target the spending to achieve greater benefits -- and this is by targeting areas where flooding could be an issue and if you used green infrastructure then you can get biodiversity benefits and are likely to reduce future costs.

What about trade-offs in resilience to multiple risks?

Certainly, it is possible to consider multiple risks when making investment decisions. This is likely in the short term to be constrained by what information is readily available. Another climate-related layer that is available is sea-level rise. Any decision should weigh up the different risks. Given the urgency with trying to 'boost employment and get the economy moving again' will mean that extensive analysis and data collection is unlikely to be possible. So, the best strategy would a 'no regrets' strategy.

Are the social vulnerability maps available for CDEM sector? And if so, how do we get this information?

The nationwide vulnerability maps are available, and additional maps can be created (for example at the regional council level). Please contact walshp@landcareresearch.co.nz.

The shovel ready project criteria includes reference to the sustainable development goals. How can we develop a set of performance measures relating to climate resilience which helps to describe the multiple outcomes that can eventuate from well-designed infrastructure responses to flood protection? We need these to be able to argue the prioritisation of this type of work compared to other shovel ready projects.

It is unfortunate that New Zealand has not yet had the discussions around what the sustainable development goals would mean in the NZ context. However, it is possible for the Ministries to develop a set of interim measures for the purpose of prioritising projects that reflect the SDG goals. There has been some thinking that could be drawn upon from earlier initiatives, e.g. the proposed ecosystem service prioritisation for freshwater projects. The prioritisation process was never finalised but that initial work could be used as a starting point for the SDGs or specific goals. Flood protection would align with a number of SDGs and using green infrastructure would contribute to even more SDGs.

I understand that The Resilience Science Challenge has defined indicators for resilience. How has this work been “merged”/aligned with ESVI and your work?

There has been some work domestically on indicators for ‘disaster’ resilience, as part of the tranche (2015-2019) of the Resilience Challenge. This work, led by [ResOrgs](#), is focused primarily on natural hazards resilience and is based primarily on management and organisational theory. See, for example:

Ivory, V.C., Stevenson, J.R., 2019. From contesting to conversing about resilience: kickstarting measurement in complex research environments. *Nat Hazards* 97, 935–947.

<https://doi.org/10.1007/s11069-019-03667-4>

Kwok, A.H., Doyle, E.E.H., Becker, J., Johnston, D., Paton, D., 2016. What is ‘social resilience’? Perspectives of disaster researchers, emergency management practitioners, and policymakers in New Zealand. *International Journal of Disaster Risk Reduction* 19, 197–211.

<https://doi.org/10.1016/j.ijdrr.2016.08.013>

The ESVI concept has drawn from a different body of literature, and uses a ‘vulnerability’ (as a function of risk, exposure and sensitivity) lens as the basis for a composite indicator. Unfortunately, the NZ Resilience Index is not being developed further, at least within the Science Challenges, however we are looking at other opportunities to compare and evaluate the two approaches.

What, in your opinion, do we need to do to over the next 5 years to establish NZ as a global leader in community resilience and applying this thinking on scale?

My own personal view is that there is enough knowledge. We know that disasters are not ‘natural’, that harmful physical processes or events can have a natural (earth or atmospheric) component, but vulnerable (that is, unprotected) people have to be exposed. We also know that vulnerability is situational, not a permanent characteristic or property of some humans and not others. Vulnerable people are made vulnerable by deeply rooted social processes. People with power in society, and

the institutions that wield and channel that power, can reduce or increase the burden of vulnerability or shift it from one group to another through policy decisions.

Reducing loss, injury, and death from natural hazards requires a comprehensive, whole society approach that engages all domains that touch people's lives: education, health care, food and nutrition, sanitation, water supply, shelter, livelihoods and employment, mobility and infrastructure, energy, law, and government institutions.

There is a real opportunity in NZ to take a leadership role in this area. We have a dynamic physical environment, are exposed to multiple risks and hazards, and have extensive knowledge about biophysical, hydrological and geological processes. Second, there is growing political will and interest in reducing losses from hazard events – esp. with the prospect of climate change which will exacerbate risk. What is needed is greater coordination between science, policy makers and practitioners. We need to support fora for sharing lessons and experiences, identifying critical needs and applying existing knowledge, tools, and frameworks to generate empirical evidence to demonstrate impact. There is a need to collaborate more extensively across the natural and social sciences. The science challenges are an excellent platform for doing much of this work, however there is a need for coordination between challenges – e.g. Deep South which is focused on climate change and Resilience Challenge – to avoid duplication, realise synergies and maximise science investment.