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Short webinars for environmental policy-makers and practitioners

Aotearoa 2055 – Navigating complexity for making good land use decisions

The following questions were asked during our live webinar with Dr Melissa Robson-Williams and Dr Linda Lilburne, held on 14 October 2025.

1. Are you able to share the systems thinking homework/concepts used with the workshops?

A link to the workshop introduction to systems thinking is [here](#).

2. When lecturing about biodiversity I ask what is more important, the range of species or the rare species that only survive in specialist habitats?

We worked at a very aggregate level, so we didn't get into this level of detail. Curious to hear what you would answer though!

3. Do you only consider financial viability, but not economic viability? (Financial viability refers to private costs and benefits, while economic viability refers to costs/benefits to the economy)

Good question. We've included aggregate financial viability and gov spending. The overall economic viability of the different scenarios definitely comes through in the discussion, but there isn't a specific cup representing that.

4. What weighting was given to the elements?

Good question. No weighting is applied. The participants discuss the incoming influences and determine the impact on the element.

5. What were the systems thinking concepts?

The first few pages of this report is a good introduction to the systems thinking concepts: <https://www.landcareresearch.co.nz/news/zooming-out-for-a-better-view-of-the-freshwater-policy-landscape> Or watch the video posted in the first answer.

6. Could you take this model a step further and develop it into a computer game type experience where when you manipulate some aspects, the others respond, and this then visualises the consequences?

We have discussed this as a project team, and there are some such tools/games available. We have focussed on the experiential aspect as the manual moving of beans is an interesting way to 'feel' or register the impacts more deeply. Discussion is an important part of our activity so we decided to limit any automation of the consequences.

"This is a very interesting tool. It looks like it could be great for engagement and education if made more accessible etc (eg the computer game experience someone mentioned). However I do have one concern around this which is that there are some didactic games or 'modelling' games (eg monopoly) but they often get absorbed as entertainment rather than real life, thought provoking representation. (Probably an issue of media literacy or expectations on how challenging media should be...). Just makes me think that presentation of it would be important."

This is a really interesting comment. We have deliberately not made it into a 'game', and thus far we haven't experienced that.

In this analog model, how did you apply/assert time delays?

Where there is a delay, for example mitigations may take a decade before the beneficial consequences are taking full effect, we put some beans in the delay boxes. These then take effect in the next decade (i.e. they are added to the relevant cup in the next decadal round).

7. Have you a procedure for Māori landlocked, land in Trust to regional and district councils, and contaminated lands, and lands with two titles etc.?

There is a high level of aggregation as discussed. So we only have 6 broad land use types.

8. This seems like a fantastic activity. The current setup seems very human-centric to me. Is there a voice for nature (cup) within the model?

There are cups for water, soil, and biodiversity, but you are right – it is very human-centric. If you are interested in research on nature's voice - you might be interested in this partner project that we are running: <https://www.landcareresearch.co.nz/discover-our-research/environment/sustainable-society-and-policy/what-if-nature-had-a-voice-or-we-learned-to-listen>

9. What were the areas/process flows that most commonly collapsed?

Good question. Typical places were available water, the reliance on cheap fossil fuels, limits to efficiency, viability of shipping and therefore export dependency, spiralling debt, access to finance and insurability, and the aggregate factor of 'productive capacity'.

10. Where or how was Māori view seen?

An important limitation of the project is that we haven't reflected Te Ao Māori. We deliberately didn't try to capture multiple worldviews on a single causal diagram as what is considered germane to the system and many of the interconnections are different across different worldviews. So, trying to combine can end-up doing a disservice to everyone. However, we think that taking a wider boundary systems view can benefit cross knowledge system work.

11. How is this being used by government agencies - is it being used by government agencies in decision making? Or are you sharing this as a potential learning opportunity for government agencies to learn from?

We have run three external workshops so far to trial and develop the activity. We think it could be useful for government agencies and are happy to discuss working with interested groups.

12. So, am I right in thinking that this project is more looking at trying to create a tool that helps people from different areas learn about limitations and complexity etc., and gain awareness? Rather than creating a definitive model we can use. What are the next steps - who could be a good target audience / way to get communities to try this?

Yes, this is correct. We are interested in your thoughts on which types of groups might be interested.

13. Would be interested in whether Housing and Infrastructure are considered in the model?

The expansion and density of urban areas is considered (as well as impacts of sea level rise on urban areas).

14. Is social licence included?

Only implicitly in that the political/societal mindset is specified for the activity. So, the activity could be run under different scenarios and thus the concept of social license could be included. However, in the last workshop, change to social license did come up in the discussion.

15. Fascinating research, thank you for sharing! What level do you envisage this tool being used at? National planning? Regional? Catchment? Individual farm? And what level of expertise do the participants require on each of the areas of knowledge? Do you need someone in the room who understands each of these areas deeply?

We've run the workshop with people with considerable experience as well as limited. A member of team will stimulate discussion in topic areas with limited expertise, and we can provide some reference material for participants where appropriate.

We see the tool as very suited to national and regional scales – as these match the level of aggregation. At a catchment and farm scale some of the high-level drivers of change may be less relevant, and significant local influences may not be on the diagram. So, the diagram would probably need to be remade. So far, we have only done national scale.

16. How would you address the differences in scale of applicability between different indicators? E.g. an appropriate scale for water quality is at a catchment level, but for climate change is perhaps at a national level.

Good question. As we said – the degree of aggregation is one of the strengths and challenges of the activity. Most participants coped okay with the aggregation, and as this is trying to paint a broad picture, we were able to talk about national trends. There has been some interest to trial it at a regional scale.

17. Is it useful to segregate the SD diagram to represent different populations or worldviews? Just thinking that a map that shows 'general' behaviour of the 'whole' system probably won't capture the social polarisation or 'extremes' that cause us a lot of pain in societies today...

The workshop can be run under different "mindsets" to see what difference this might make. There has to be a high level of aggregation just to get the system being represented on a page – this is part of helping people grasp the wider system.

18. What sectors saw the most land use change through your workshops, and did it vary across workshops?

Good question. Agricultural land showed the most change. That was pretty consistent across groups, but for different reasons.

19. Could this be combined with existing economic models of drivers of land use change? It would be great to have a body of work that could have broad cross-sector buy-in as a useful representation of real life and narrow down disagreement to genuine policy choices rather than fact-based disagreements.

Interesting point. We are looking into what sorts of land use choice models this could couple with – your point is a good additional one to consider.

20. I appreciate that this is a complex topic and to get this understood first in a wider context before incorporating whakaaro Māori is a good thing. I'd love to see how Māori practitioners would do the same thing and then bring the two ways of thinking together to see where the commonalities and differences are. Thoughts?

Great pātai. You are right – it would be really interesting future step of the project.

21. Do you have any tangible examples of where a group landed in 2055 in respect to the land use decisions made?

Each group and each round (using a different mindset) came up with different and uses of land. Some scenarios saw a big shift to biofuels, some had settings that saw large areas of land lost to pest species, some saw large tracts shift to forestry. It all depended on the mindset and scenario being explored.

22. Did you have different variety of participants (e.g. scientists, farmers) in a single workshop? If so, how it did /didn't help in converging the ideas?

Our first workshop had a mix of farmers and regional council staff. This meant that the discussions were informed by the two perspectives which worked well.

23. Could be a useful tool for all government decision-making, local and national. Also prior to elections to allow us voters to see the potential impacts of party policies! How are social and cultural impacts assessed? Is it overall or can it demonstrate inequalities?

Social and cultural impacts are assessed collectively by the participants under the 'societal wellbeing' cup. Although not specifically mapped, changes to inequality, polarisation, social connectedness etc were discussed each round.

24. Was the tidal distance in rivers assessed?

No – the discussions did not reach this level of detail.

25. Would this ever be able to be used in schools? I'm thinking groups of year 13/12 students taking a day to work through this, after focussed learning blocks on the various areas. Maybe with field experts to guide thinking etc.

Yes, that would be very interesting – great idea. Please reach out if you want to discuss further.

26. What does future funding for this sort of research look like currently?

It's hard to know what future funding might be given the current changes to the science system and shifts in the science funding. We were interested to run the activity across the newly formed Bioeconomy Science Institute to see if it might be useful for helping research integrate across this much larger organisation, and as a tool to inform broader land use discussions.

27. Much positive reinforcement in the system comes from global influence which cannot be balanced at the national scale (e.g. export demand, carbon emissions). How are you managing this?

Yes – you are right. A number of the elements are treated as exogenous in that they are determined from outside the system. We handle this by specifying some of these elements in the scenario that is defined at the beginning of each decade.

28. Are you able to run this for other organisations?

Yes. Please get in touch directly if you are interested.

29. For someone wanting to develop a systems model is there a template you used for your workshops?

No, not really. But there are some great introduction texts on systems thinking (e.g. Intro to systems thinking by Maani and Cavana, 2007), also this report has a good general introduction <https://www.landcareresearch.co.nz/news/zooming-out-for-a-better-view-of-the-freshwater-policy-landscape>