

**Ausseil, Anne-Gaelle**<sup>1</sup>, Loretta Garrett<sup>2</sup>, Tracy Williams<sup>3</sup>, Estelle Dominati<sup>4</sup>, John Dymond<sup>1</sup>

<sup>1</sup>Landcare Research, New Zealand. <sup>2</sup>Scion, New Zealand. <sup>3</sup>Plant and Food, New Zealand.

<sup>4</sup>AgResearch, New Zealand

## **Can co-innovation lead to high impact land and water indicators? A think piece for future research in New Zealand**

**Key words:** Indicators, Land and Water Domain, Future Research

### **Abstract:**

New Zealand's land is dominated by primary production sectors, and there are increasing pressures coming from competing economic, environmental, social, and cultural values. These values are often in tension due to the diversity of perspectives held by stakeholders. To represent these values, indicators have been developed in a number of contexts, reflecting either domestic or international drivers. We led a think piece<sup>1</sup> to address the question: *'can co-innovation lead to high impact land and water indicators?'* This research was done in the context of New Zealand's Our Land and Water National Science Challenge, whose mission is to enhance primary sector production and productivity while maintaining and improving land and water quality.

We reviewed existing indicator initiatives, assessed current approaches to the design and use of indicator sets, and analysed the extent to which co-innovation was used. Our review confirmed that previous work on land and water indicators in New Zealand has had diverse goals, target audiences, values considered, time scales, physical scales, conceptual frameworks, extent of engagement, resources deployed, data management activities, and ultimately, impact. In particular, frameworks typically relied heavily on science to inform discussion about current states, limits, and trends. Co-innovation was evident to varying degrees in the development stages, and could play an important part in the best practice process of indicator development. It was a critical element in projects that were either case study specific or related to a targeted group (e.g. sector-based indicators). In these examples, co-innovation helped scope the goal and reach agreement on the values and indicators on which to focus. Some programmes, in particular top-down approaches, used co-innovation to a lesser extent, preferring in-house or targeted experts. We made recommendations for further discussion and research direction for future land and water indicators development.

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