



REPORT NO. 3842

INDICATORS OF COLLECTIVE RESPONSIBILITY BY CATCHMENT GROUPS

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INDICATORS OF COLLECTIVE RESPONSIBILITY BY CATCHMENT GROUPS

JIM SINNER¹, MARGARET KILVINGTON²

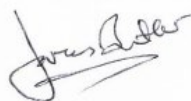
¹ Cawthron Institute

² ISREF - Independent Social Research, Evaluation & Facilitation

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CAWTHRON INSTITUTE
98 Halifax Street East, Nelson 7010 | Private Bag 2, Nelson 7042 | New Zealand
Ph. +64 3 548 2319 | Fax. +64 3 546 9464
www.cawthron.org.nz

REVIEWED BY:
James Butler



APPROVED FOR RELEASE BY:
Roger Young



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EXECUTIVE SUMMARY

Indicators help people assess how well their strategies and programmes are working. For example, if central government agencies or regional councils have a strategy of supporting catchment groups as a primary way of improving the health of freshwater ecosystems, then they may want to evaluate whether that strategy is working. We could just monitor indicators of ecosystem health, but that can take a long time to respond to changes in land use practices. Therefore, organisations also need indicators of intermediate outcomes to provide some assurance that things are headed in the right direction.

Indicators for a given catchment group might be different than indicators for a support body, such as a government agency, regional council or sector organisation that wants to assess the effectiveness of its own policies. This report makes some general observations about the process of developing indicators and then offers some suggested indicators for catchment groups and for support organisations.

Ideally, plans—with activities, outputs, and indicators of success—would be designed at the outset of an initiative. In practice, things do not always happen in the order recommended in textbooks. When action has begun without a clear plan, the process of designing indicators of success can still be useful, because it encourages people to pause to consider their situation and start planning to achieve their goals.

To be effective, this process should:

- Utilise a framework (e.g., logic model or a theory of change) that prompts exploration of the interconnected components of the situation and generates insights into causes and effects;
- Apply criteria (such as SMART—specific, measurable, achievable, relevant and time-bound) to ensure that indicators provide useful signals about progress toward objectives; and
- Be designed by those at the level where they will be applied.

Indicators used by people acting in different parts of a complex system provide a language, or ‘boundary objects’, for communication across the system. Agencies, sector groups and catchment groups can all use their indicators – developed separately or jointly – to express their anticipated paths and ways of measuring progress. This enables greater transparency and connection with others.

We consider that the following five factors would indicate that a catchment group is making good progress toward collective responsibility and action that will contribute to improved freshwater outcomes:

1. Catchment group members accept responsibility for, and are committed to, improving freshwater in their catchment.

2. The catchment group has specific, preferably measurable, freshwater improvement objectives for their catchment, based on objectives developed with the council or wider community.
3. The catchment group has a plan of actions that are designed to contribute to these objectives. The actions may be as individual members (e.g., farm plans), as a collective, or in cooperation with others.
4. The catchment group has a mechanism for reporting to others (e.g., tangata whenua, local community, regional council).
5. The catchment group has relationships with other parties in the catchment and seeks to connect them to the group's objectives and actions. Important parties for relationships include: tangata whenua of the catchment, other landowners, councils, and other interested organisations (e.g., Fish & Game, Department of Conservation, kayakers etc.).

Without progress on each of these five factors, catchment groups may do much good work but are less likely to be building collective responsibility and action to improve freshwater health with the urgency needed and expected.

Based on these factors, or on other factors identified in its own strategy, a catchment group could develop indicators of success, or at least indicators of progress. To develop these indicators, they should ask themselves: For each factor, what would we expect to see if a group is doing this? What would some progress, considerable progress and excellent progress look like? Equally, one needs to look for disconfirming evidence: What would tell us that a catchment group is not making progress on this factor?

Indicators for a support body are likely to be somewhat different than indicators for a catchment group, although there can also be some overlap. For example, a catchment group might track how many individual farm plans in its catchment area include actions that target key issues identified by the regional council. A support body might use this metric to compare farm plans in catchments with and without catchment groups, or to compare groups that received support (financial, technical, administrative) with groups that did not.

Catchment groups and support agencies can develop their own indicators, based on their own objectives and programme logic. They may wish to consider using some information that has been gathered in earlier surveys, while recognising that this needs to be framed appropriately (potentially through the use of rubrics) to make these measures useful and relevant for assessing progress in their contexts.

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1. INTRODUCTION

1.1. New models of collective responsibility

1.1.1. *The research project*

This report is produced as part of a research project, New Models of Collective Responsibility, funded by Our Land & Water National Science Challenge. Researchers led by the Cawthron Institute are investigating how catchment communities can be encouraged and supported to work collectively to improve freshwater outcomes. More information about this research can be found on the project's webpage: <https://ourlandandwater.nz/incentives-for-change/new-models-of-collective-responsibility/>

1.1.2. *Purpose of this report*

This report meets a deliverable in our contract with Our Land & Water for production of a report 'on success indicators for collective management, e.g., the number and quality of collectively designed farm plans, analysis of comments on blog posts, or downloads of reports and articles'.

A substantial literature exists on the development and use of indicators for monitoring and evaluation. We draw on some recent work to provide context and then focus on indicators for catchment groups.

Indicators help people assess how well their strategies and programmes are working. They 'quantify and simplify phenomena and help us understand and make sense of complex realities' (Allen 2022). For example, if central government agencies or regional councils have a strategy of supporting catchment groups as a primary way of improving the health of freshwater ecosystems, then they may want to evaluate whether that strategy is working. We could just monitor indicators of ecosystem health, but that can take a long time to respond to changes in land use practices. Therefore, organisations also need indicators of intermediate outcomes to provide some assurance that things are headed in the right direction.

Indicators for a given catchment group might be different than indicators for a support body, such as a government agency, regional council or sector organisation that wants to assess the effectiveness of its own policies. This report makes some general observations about the process of developing indicators and then offers some suggested indicators for catchment groups and for support organisations.

For this report, a catchment group is defined as *a group of people in an area defined primarily by catchment or subcatchment boundaries who are collectively addressing issues affecting the land and associated water bodies for which they have some legal, moral or customary responsibility.*

2. INDICATORS FOR MONITORING AND EVALUATION

2.1. Indicators for monitoring and evaluation

There is a wealth of information on the use of indicators in evaluation and monitoring. It is useful to provide some background from this literature to improve understanding of how to develop and use indicators of success for collective management of freshwater. This section has drawn from sources provided through the work of Dr Will Allen (Learning for Sustainability) and materials on his website including resources, analysis and guides on tools for environmental management, monitoring and evaluation: <https://learningforsustainability.net/>. Statements in *italics* are direct quotes from Allen (2022).

2.1.1. Linking indicators to planning and monitoring for outcomes

Catchment groups and other cooperative endeavors addressing environmental challenges face many choices about how to achieve what are broadly articulated aims—e.g., improvement in water quality. Thinking strategically about what might be useful and reflecting on what is working and what is not is fundamental to finding a way forward. While this may happen in more or less structured ways, Allen notes that these practices of *planning, monitoring and evaluation are at the heart of a learning-based approach to management*. Allen further comments about the value of the plan itself describing it as a “*route-map*” from the present to the future. *To plan a suitable route, you must know where you are (situation analysis) and where you want to go (establish goals and identify outcomes). Only then can appropriate action plans be developed to help achieve the desired future.*

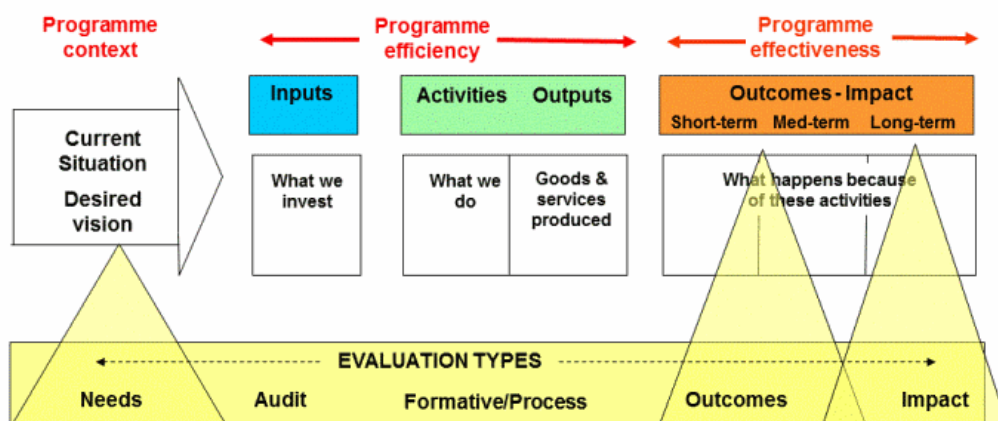


Figure 1. A project logic model showing how different evaluation types and approaches can be used to measure progress through different stages of implementation. Source: Allen (2022).

Allen's diagram (Figure 1) shows an outcomes or logic model approach to project planning¹. Frameworks such as this are commonly used in workshops and discussions on: planning for long-term complex goals; supporting robust discussion about the current situation; assessment of the required investment in particular resources and activities to generate particular outputs; and reflection on the sequence of medium- and long-term outcomes that build to the wider vision. Indicators are and can be generated for use throughout this planning process, e.g., providing information on the starting context (what is happening right now?), the efficiency of the activity (are the right people being reached?) and ultimately the effectiveness or impact on the goals.

As Figure 1 also shows, different evaluation types can be used to assess different parts of the overall project or change initiative², and indicators can be used at all stages to track whatever people want most to know about. For instance, funding agencies concerned about accountability might want to track their investments in a programme (see 'Inputs' at upper left in Figure 1). They might track who has received funding and whether it has been spent as intended. Examples of indicators that could signal successful distribution and use of funds include: (a) the percentage of available funds disbursed (less than 50% might be a poor result, and 100% an excellent result) and (b) the share of funds spent by recipients on the target project work (again 50% might be a poor result and 100% excellent). These simple indicators can provide information on how well funds are hitting their target audience.

However, if funding agencies want to know if their funding has contributed to an important long-term outcome (e.g., reduction in nitrogen in a freshwater system, improved fish habitat), then the agency will need a more substantial logic model and theory of change to connect their input to this larger goal. A theory of change identifies the elements needed for success of a long-term endeavour involving many stakeholders with different roles to play and different motivations. Developing a theory of change often reveals assumptions programme leaders have made about how people will react to situations; this can help to pinpoint critical factors to monitor as indicators of success.

As Allen observes:

Logic models provide links between activities and outcomes that connect programmatic activities to client or stakeholder outcomes, but a 'theory of change' goes further, specifying how to create a range of conditions that help programmes deliver on the desired outcomes. These can include setting out the right kinds of partnerships, types of forums, particular kinds of technical assistance, and tools and processes that help people operate more collaboratively and be more results focused.

¹ See also <https://learningforsustainability.net/logic-models/>

² See also <https://learningforsustainability.net/evaluation-questions/>

More complex programmes—including many that address environmental management challenges—need some theory of change³ to bring focus to the multifaceted processes and interventions required. Indicators can provide an effective way of learning and adapting the programme over time. For example, indicators can provide information on whether target groups or individuals are learning new practices, or forming useful new relationships, or accessing information, which the theory of change might have identified as important steps in progressing to the overall outcomes.

Theories of change do not need to be externally derived. Facilitated project planning exercises can identify the knowledge and assumptions of practitioners about why they believe a particular action will work to achieve a given goal. Indicators of ‘what this will look like when it succeeds, or fails’ help to ground truth these assumptions.

Any set of indicators that paints a picture of progress towards long-term outcomes needs to include at least some indicators that track lower order outcomes that can be achieved in a shorter time, and which are known (or have a good basis for being assumed) to be significant for achieving the larger goal. This recognises that there are ‘orders of outcomes’ in any long-term endeavour.

Ultimately, indicators that are developed as part of project design can help those involved to tell a good story and to maintain momentum. Project designers should think ahead to the headlines they imagine seeing in five years and ten years if the project is going well. What evidence would help to validate those headlines?

2.1.2. Identifying indicators of success as a means of supporting project planning

Ideally, plans—with activities, outputs, and indicators of success—would be designed at the outset of an initiative. In practice (particularly in grass-roots initiatives), other things typically come first: enthusiasm, leadership from individuals, and actions that take advantage of current opportunities, such as government funding. In such situations, a generally shared ambition can quickly become a goal or even a widely anticipated outcome, and activities more or less aligned to this can be undertaken without consideration of their priority or efficacy for achieving the overall aims.

Taking the time to explore how to understand ‘what is progress’ and to identify indicators of success can be very useful in such situations. It encourages people to look across the situation they are working on and potentially identify areas that may not be receiving the attention they need.

³ See also <https://learningforsustainability.net/theory-of-change/>

Allen describes the increasing use of rubrics⁴ to assess complex tasks and behaviours⁵:

Rubrics are both an instructional tool and a performance assessment tool. They act as a guide to help practitioners clarify and understand both the objectives required to complete any particular initiative and the qualities required for achieving high standards in those objectives. Although the format of a rubric can vary, they all have two key components: A list of criteria – or what counts in an activity or task, and graduations of quality – to provide an evaluative range or scale.

Rubrics allow for a wide range of quantitative and qualitative descriptors to identify whether a core task has the ingredients it needs to be achieved. Having a way to describe the evidence for when something has not been achieved or is struggling is as important as identifying success. Assessments that fail to collect disconfirming or counterfactual evidence are ultimately of limited value as they mean that parts of a project system that are not performing remain unrecognised.

Rubrics can be sophisticated or back-of-the envelope and are suited to grass-roots groups as well as agencies and sector groups—anyone who is tackling a complex task with multiple factors. Logic model narratives and rubrics can be used at national or local level—using participatory processes with experts and practitioners relevant for the situation. Such an approach to monitoring will challenge the existing kinds of metrics (number of groups formed, number of trees planted) to justify their place as meaningful indicators of progress towards improved freshwater outcomes.

The idea that success or failure should be defined by those who are implementing a project can seem problematic if the project is sponsored by another entity, which might prefer to set its own criteria. However, evaluation in complex real-world situations should be designed to enable adaptive learning; it should not be only, or even primarily, about judging people's performance. Improving complex systems is difficult and people need monitoring and evaluation systems that support their ability to learn and develop, so they should be involved in designing the indicators.

Finally, indicators of success developed by people acting in different parts of a complex system provide a language, or 'boundary objects', for communication across the system. Agencies, sector groups and catchment groups can all use their indicators—developed separately or jointly—to express their anticipated paths and ways of measuring progress. This enables greater transparency and connection with others.

⁴ A rubric is a scoring guide used to evaluate performance. It typically has three parts: one or more indicators, performance criteria, and a rating scale. See Allen (2022). An example is provided in Section 4.2 of this report.

⁵ <https://learningforsustainability.net/rubrics/>

2.2. What makes a good indicator?

A report from an Indicators working group established by Our Land & Water National Science Challenge said:

We define an indicator as a relevant variable, measured over time and/or space, that provides information on a larger phenomenon of interest and allows comparisons to be made (PWC 2017, p.3).

The report added:

The importance of the second element – that indicators provide information on a wider phenomenon of interest – should not be understated. This goes to one of the key elements of indicators, that they are not collected or measured for their own sake. Indicators can only ever tell part of the story. They inform users about the state and trend of different phenomenon, but they are not the principal matter of interest. Indicators are a tool for providing information on other complex phenomena, and it should be remembered that they are just a tool and not an end in and of themselves. Particularly when indicators are used to set objectives and targets, it should be clear that the indicator is merely a way to measure the ultimate goal and is not a goal itself (PWC 2017, p.4).

Comments on the worldwide trend for use of indicators to monitor development and track progress⁶ are also pertinent here.

Indicators quantify and simplify phenomena and help us understand and make sense of complex realities... To be most meaningful, a monitoring and evaluation programme should provide insights into cause-and-effect relationships between environmental or socio-economic stressors and the anticipated ecosystem responses and subsequent social and economic outcomes (Allen 2022).

In a report on effective indicators for freshwater management, Allen et al. (2012, p. vi) proposed that indicators should:

- Be directly relevant to the issue or problem in question
- Have a direct or proxy relationship to the attribute (value, threat, action) being assessed
- Complement other indicators to adequately characterise the system collectively
- Be able to be feasibly collected, analysed and reported on in a cost-effective and timely way
- Be defensible and transparent to a range of audiences
- Have a direct use for decision making.

⁶ See also <https://learningforsustainability.net/developing-indicators/>

Subsequently, PWC (2017) identified six criteria that the best indicators should meet.

- Validity
- Accessible data
- Performance-based
- Easily communicable
- Clearly defined and standardized
- Widely accepted.

Figure 2 elaborates on the interpretation of these six criteria. While these criteria describe ideal features of indicators designed for wide use and dissemination, it is also important to consider the goals and needs of the entity developing the indicators, as described in Section 2.1 above.



Figure 2. Criteria for good indicators. Source PWC (2017).

Many of the criteria identified by Allen et al. (2012) and PWC (2017) are captured in the acronym SMART (i.e., specific, measurable, achievable, relevant and time-bound). As the following sections will discuss, SMART indicators can incorporate a variety of qualitative and descriptive components. Descriptive or scenario-based indicators can provide useful and readily recognisable signals about progress in areas such as relationships and trust building, which are often identified as important aspects, or even objectives, of catchment group activity.

3. INDICATORS OF CATCHMENT GROUP SUCCESS

3.1. What objectives are we trying to measure progress against?

As discussed above (Section 2.1), indicators should be linked to objectives and the necessary conditions for their achievement. In this section we look first at objectives of catchment groups, followed by the objectives of government agencies supporting catchment groups.

3.1.1. *Catchment group objectives*

In a survey of catchment and community environment groups, Sinner et al. (2022) asked respondents to describe up to three reasons why their group had formed. Of the 42 groups with a primary focus on waterways (the category that most closely aligns with how we have defined catchment groups for this report), 74% mentioned a desire to improve water quality as a reason for establishing the group. Other commonly cited reasons were community outreach and collaboration (40%), gaining and sharing knowledge within the group (36%), advocacy, e.g., being in planning decisions (31%), and supporting farmers to adopt good management practices (21%). A reasonable share of these groups (21%) also mentioned biodiversity reasons, e.g., species or habitat protection (Sinner et al. 2022).

Some of these objectives (e.g., improved freshwater health and species protection) may be ultimate objectives in their own right, that is, the reason for them is simply that the outcome is valued by the participants. Other objectives (sharing knowledge, advocacy, supporting farmers) are likely to be intermediate objectives, that is, they are being pursued in support of some greater (ultimate) goal, whether that is improving the health of a water body, making a river safe for swimming, or gaining community recognition of farmers' environmental work. Identifying ultimate goals will help groups identify more effective actions to achieve them.

The survey also asked if the respondent's group has a management plan, for example, a plan that states what and when activities will be done. Roughly half (49%) of all groups that responded have developed their own management plan, and another 22% of groups have had a plan developed by or with a third party (a council, consultants, individuals, industry bodies or others) (Sinner et al. 2022). However, that study did not examine these action plans, so we do not know to what extent the plans contain or reflect logic models that connect actions to intermediate and then long-term outcomes.

3.1.2. *Government objectives*

At a national scale, government departments have multiple reasons for funding catchment groups, revolving mainly around improving freshwater health, biodiversity and resilient communities. In announcing funding for catchment groups in Otago, a

media release from the Minister of Agriculture referred to the government's objectives, which were:

to restore New Zealand's freshwater environments to a healthy state within a generation (O'Connor 2021).

The Minister was then quoted as saying:

"Catchment groups provide a valuable platform to promote good on-farm practices and sustainable land management, showcase innovation and success, and positively shift the dial for the environment" (ibid).

Noting that the government is supporting more than 170 farmer-led catchment groups across the country, the Minister added:

"Nationally, these groups provide on-the-ground support to more than 5,000 farmers, helping them access expertise and tools to improve their environmental and economic sustainability, not to mention wellbeing" (ibid).

These statements provide insights into the government's programme logic and intermediate outcomes, as well as its long-term objectives. To achieve the objective of restoring freshwater environments to a healthy state within a generation, the government will help groups to access expertise and tools and to promote good on-farm practices to showcase innovation and success. Identifying this programme logic helps to point towards indicators that can be used to evaluate whether the programme is working as intended, e.g., by tracking whether groups are getting access to expertise and tools.

Some regional councils are also supporting catchment groups. One example is the Otago Regional Council, which in 2020 announced \$200,000 funding to help establish an umbrella organisation to support new and existing catchment groups. In the council's media release, Councillor Bryan Scott was quoted as saying:

Ideally, this strategic support will assist [catchment groups] on their respective journeys, particularly those that are evolving or endeavouring to get to the next level. One of the many great things about catchment groups is that regardless of current politics or policies, people of all backgrounds can simply roll up their sleeves and work together to achieve positive things for their waterways and environment. (ORC 2020)

Other regional councils are likely to have other reasons for supporting catchment groups, ranging from specific programme objectives to more general support of rural communities.

3.2. Existing data on catchment groups

Research on catchment groups at national, regional or local scales is occurring and, while the resulting studies do not provide indicators of success or achievement in of themselves, they are potential sources of information that can be used to track trends. Thriving Southland commissioned a survey to understand the perspectives of individual farmers, many of whom were involved in catchment groups (Thriving Southland 2021). The survey had 200 responses, of which 71% were farm owners or farm managers.

Table 1 shows a selection of the data from the survey.

Table 1. Selection of results from a survey of Southland farmers and other rural support people. Source: Thriving Southland (2021).

	Question or topic	Response format	Results
1	Are you involved with a farmer-led community catchment group?	Yes/No	61% yes
2	How well is your catchment group working?	Scale of 1 (Struggling) to 5 (Working really well)	68% said 3 or higher, 22% unsure
3	Does your farm have a Farm Environment Plan?	Yes, Unfinished, No	58% yes, 22% with unfinished plan
4	Use of Farm Environment plan	Yes/No	88% yes, of those with a plan
5	On-farm monitoring	Tick all that apply (11 options)	Fertiliser placement 78% Rainfall 68%, Soil 62%
6	Self-rating of water quality on own farm	Very poor to Very good	Very good 20%, Good 38% Moderate 29%, Poor, Very poor, Don't know 10%
7	Self-rating of water quality in Southland waterways	Very poor to Very good	Very good 8%, Good 20% Moderate 44%, Poor, Very poor, Don't know 17%
8	Strength of linkages between your catchment group and local Iwi	None to Strong	6% strong linkages, 15% no linkages, 46% unsure
9	Adoption of Good Management Practices	Tick all that apply (options)	Paddock selection for wintering 80%, Strategic fertiliser use 78%, Protection of critical source areas 73%, Protection of riparian areas 73%
10	How well do sector groups collaborate with catchment groups?	Not at all to Very well	41% working well or very well, 40% unsure

The types of questions in this survey are based on certain understandings and ideas about what represents progress for a catchment group (i.e., a theory of change). This includes the influence of catchment groups on individual farmers and their practices

(e.g., items 1, 3, 6 and 9 in Table 1), and the functioning and strengths of the groups themselves (e.g., items 2 and 10). However, the survey has limitations when it comes to providing information about trends or programme effectiveness regarding the achievements of catchment groups. There is no clear linkage between farmer behaviour and membership or otherwise of a catchment group (changes in behaviour could be—and indeed are likely to be—a result of many factors), and questions that ask “how well” something is happening (e.g., 2 and 10), without clear descriptors for what constitutes “well”, are subjective.

A different approach was taken by Sinner et al. (2022), who conducted a survey of catchment and community environment groups in 2021. Table 2 shows a selection of the questions and results from catchment groups that responded to the survey.

Table 2. Selection of results from a survey of catchment groups. Groups were categorised by their primary focus, biodiversity, waterways or both. Results are shown for groups focused on waterways or on both. Source: Sinner et al. (2022).

Question or topic	Biodiversity & Waterways		Waterways	
Main environmental objectives of the group	Habitat & species	64%	Water quality	60%
	Water quality	50%	Habitat & species	57%
	Pest control	39%	Community outreach	38%
	Good farming practices	25%	Pest control	19%
Specific environmental targets	Only 10% of groups reported specific targets, and many of these stated goals such as “eliminate all pests from the area”.			
Tangata whenua membership in group		43%		44%
Involvement with tangata whenua		70%		68%
Management plan				
- By group		50%		28%
- By third party		11%		20%
Monitoring progress		68%		48%

These data collected by Thriving Southland and Sinner et al. (2022) provide background to the current state of catchment groups and may be a source of indicators for inclusion in an overall framework of assessment.

3.3. Other possible sources of indicators

Other research projects funded by Our Land & Water (OLW) National Science Challenge might also provide indicators to track the success of catchment groups.

The OLW Register of Land Management Actions project is designing a register that will collate data from existing initiatives by farmers and growers, iwi and hapū, and others to record actions that landowners and others have done to improve the health of waterways. The register will present information at a catchment scale, recognising the confidentiality and privacy of individual property owners. Doehring et al. (2020) describe the need for this register and some initial indicators that have been identified. A mock-up of how the information might be reported is available via the OLW website⁷.

A new project funded by OLW, on 'signals for land stewards', is testing whether extension interventions can be improved by identifying the information from on- or off-farm (the operating and external environments) that either drives or holds back a farmer from moving along a constructive change process (D Bewsell, Scarlatti, personal communication). While this work is focused on interventions targeting individuals, it could also identify elements of useful indicators for catchment groups. For example, farmers are likely to be influenced by what other farmers in their catchment are doing, so measures of activity by a local catchment group could be both a key signal for farmers and an indicator of success for catchment groups.

We are also aware of possible work for government departments on evaluation of programmes to support catchment groups. Such work could benefit from consideration of this report and the research mentioned above.

4. INDICATORS FOR CATCHMENT GROUPS

4.1. Success factors for catchment groups working toward collective responsibility

Our research is exploring how catchment groups might become a vehicle for collective responsibility for the long-term goal of improving freshwater outcomes. Having catchment groups actively contributing to this goal is an 'intermediate outcome' based on the proposition that collective action is necessary to tackle pernicious issues such as agricultural runoff into waterways and loss of biodiversity (Yoder et al. 2022).

Based on our research to date⁸, we consider that the following five factors would indicate that a catchment group is making good progress toward collective responsibility and action that will contribute to improved freshwater outcomes:

1. Catchment group members accept responsibility for, and are committed to, improving freshwater in their catchment.

⁷ <https://ourlandandwater.nz/incentives-for-change/national-register-of-actions/>

⁸ <https://ourlandandwater.nz/incentives-for-change/new-models-of-collective-responsibility/>

2. The catchment group has specific, preferably measurable, freshwater improvement objectives for their catchment, based on objectives developed with the council or wider community.
3. The catchment group has a plan of actions designed to contribute to these objectives. The actions may be as individual members (e.g., farm plans), as a collective, or in cooperation with others.
4. The catchment group has a mechanism for reporting to others (e.g., tangata whenua, local community, regional council).
5. The catchment group has relationships with other parties in the catchment and seeks to connect them to the group's objectives and actions. Important parties for relationships include: tangata whenua (e.g., hapū and/or marae that affiliate to the land and water in the catchment), other landowners, councils, and other interested organisations (e.g., Fish & Game, Department of Conservation, kayakers).

Without progress on each of these five factors, catchment groups may do much good work but are less likely to be building collective responsibility and action to improve freshwater health with the urgency needed and expected.

4.2. Developing indicators

Based on these factors, or on other factors identified in a catchment group's own strategy (see Section 2.1 above), a catchment group could develop indicators of success, or at least indicators of progress. To do this, one considers what would constitute confirming evidence: For each factor, what would we expect to see if a group is doing this? What would some progress, considerable progress and excellent progress look like? Equally, one needs to look for disconfirming evidence: What would tell us that a catchment group is not making progress on this factor?

Rubrics can be used as the basis for indicators using assessment of qualitative criteria. An example could be different degrees of involvement of tangata whenua to represent poor, fair, good and excellent involvement. Indeed, involving tangata whenua in the development of such a rubric would be a good step on the way to 'excellent' involvement. It is important to talk to tangata whenua 'of the catchment', i.e., who have ancestral connections to the land and water of the catchment, noting that this could be more than one iwi, hapū or marae.

Table 3. Example of a possible rubric for an indicator for quality of a catchment group's relationship with tangata whenua of the catchment.

Rating	Description
Undeveloped	Little or no contact with the iwi/hapū of the catchment or local marae
Fair/Emerging	Catchment group leaders have been welcomed onto a local marae and occasionally meet with iwi/hapū/marae representatives (up to 2x/year)
Good	Catchment group leaders have been onto local marae, meet with catchment iwi/hapū/marae representatives at least annually, AND the group has objectives and action plans aligned tangata whenua values
Excellent	Tangata whenua of the catchment are active members of the catchment group and share in the decision-making. The group meets regularly and has objectives and action plans aligned with tangata whenua values.

For an individual catchment group, indicators that are relevant to its plan for achieving its objectives, and that are self-derived, may be more useful than indicators developed or imposed by others. That said, criteria for what makes a useful and valid indicator (see Section 2.2) remain relevant. Having some discipline around identifying indicators, however simple, reduces the chance of programmes or groups doing last-minute searching to identify 'wins and lessons' to persuade others of their success. Developing indicators for short and intermediate outcomes is especially important given the long lag times before we are likely to see progress toward the ultimate goals.

Indicators for a support body are likely to be somewhat different than indicators for a catchment group, although there can also be some overlap. For example, a catchment group might track how many individual farm plans in its catchment area include actions that target key issues identified by the regional council. A support body might use this metric to compare farm plans in catchments with and without catchment groups, or to compare groups that received support (financial, technical, administrative) with groups that did not.

Support bodies should avoid placing the burden of collecting data entirely on those receiving grants or support without providing resourcing to groups for this task.

4.3. Possible indicators for catchment groups

Catchment groups and support agencies will likely want to develop their own indicators, based on their own objectives and logic models, as outlined in this report. Some indicators that could be useful are listed below. Some of these have been measured in earlier surveys, as described in Section 3.2 above.

Many of the following indicators would become more meaningful if they were further developed in a process that unearths the objectives and programme logic for a catchment group or support organisation. Such a process should also include the development of rubrics for assessing varying levels of progress.

Possible indicators that could be used by a **catchment group** include:

- Percentage of catchment land managed by group members
- Adoption of specific objectives that relates to the catchment and its values, preferably measurable, timebound and based on national, council or community objectives
- Active use of a plan of action for achieving the group's objectives
- Percentage of members with a farm environment plan aligned with the group's plan
- Extent of monitoring progress toward objectives, and whether results are shared with external parties
- Extent of involvement of tangata whenua and other important groups with ties to the catchment
- Number of activities organised by the group in past 24 months
- Actions taken by the group or members consistent with the group's plan
- Evidence of progress towards freshwater and other group objectives.

Possible indicators that could be used by a **support body** for catchment groups include:

- Number of catchment groups in New Zealand (e.g., defined as a group of people responsible for managing land within an area defined primarily by catchment boundaries, and others with customary
- Percentage of land managers (e.g., with holdings greater than 4 ha) who are members of a catchment group
- Number and percentage of groups with measurable objectives aligned with national or regional policy objectives (e.g., related to objectives of the support agency)
- Number and percentage of groups monitoring progress toward objectives
- Number and percentage of groups with involvement by tangata whenua or representatives of other important groups in the catchment group.

For an agency or other body wanting to evaluate the effectiveness of its support, it may be worthwhile to fund research to compare action in catchments with and without catchment groups. For example, if there is no significant difference in the amount of fencing or riparian planting or constructed wetlands, interviews might be needed to understand why catchment groups appear to be having little impact. Over longer

periods of time, a support agency would also want to compare trends in water quality and other freshwater outcomes in catchments with and without catchment groups. Such trends can take many years to be detectable, however, which is why it is important to have indicators of intermediate outcomes.

5. CONCLUSION

Indicators help people assess how well their strategies and programmes are working. While evidence of success is often requested by external funding agencies, indicators are also valuable tools for programme managers. Indicators are most useful if they have been developed based on a logic model or theory of change that identifies the logic behind the programme, i.e., how the planned actions will affect multiple factors (e.g., social, relational, economic) and thereby lead to the desired long-term objectives.

Because ecosystem health can take a long time to respond to changes in land use practices, organisations need indicators of intermediate outcomes to provide some assurance that things are headed in the right direction.

Catchment groups and support agencies can develop their own indicators, based on their own objectives and programme logic. They may wish to consider some information that has been collected in earlier surveys, recognising that this needs to be framed appropriately (potentially through the use of rubrics) to make these measures useful and relevant for assessing progress in their own contexts.

6. REFERENCES

- Allen W 2022. Planning, monitoring & evaluation – closing the loop.
<https://learningforsustainability.net/plan-monitor-evaluate/>. Learning for Sustainability.
- Allen W, Fenemor A, Wood D 2012. Effective indicators for freshwater management: attributes and frameworks for development. Landcare Research Contract Report LC995. Prepared for Aqualink, Research for the MSI Wheel of Water Project.
- Doehring K, Young RG, Robb C 2020. Demonstrating efficacy of rural land management actions to improve water quality-How can we quantify what actions have been done? *Journal of Environmental Management* 270: 110475.

- O'Connor D 2021. Funding boost for community-led catchment groups in Otago. Media release. 15 November. <https://www.beehive.govt.nz/release/funding-boost-%C2%A0community-led-catchment-groups-%C2%A0otago>.
- ORC 2020. ORC supporting a joined-up approach to assist catchment groups in Otago. Media release. 21 September. <https://www.orc.govt.nz/news-and-events/news-and-media-releases/2020/september/orc-supporting-a-joined-up-approach-to-assist-catchment-groups-in-otago>.
- PWC 2017. Signs to look for: Criteria for developing and selecting fit for purpose indicators. Prepared for Our Land and Water National Science Challenge.
- Sinner J, Tadaki M, McCarthy A, Challies E, Thomson-Laing J 2022. Catchment and community environment groups: goals, activities and needs. Prepared for Ministry for the Environment. Cawthron Report No. 3733. 67 p.
- Thriving Southland 2021. Thriving Southland Catchment Group, Farmer and Stakeholder Annual Survey 2021.
- Yoder L, Wagner CH, Sullivan-Wiley K, Smith G 2022. The Promise of Collective Action for Large-Scale Commons Dilemmas: Reflections on Common-Pool-Resource Theory. *International Journal of the Commons* 16(1).