



NEW ZEALAND SUSTAINABILITY DASHBOARD

SYNTHESIS REPORT

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About this report series

The New Zealand Sustainability Dashboard (NZSD) Report series is a publication of the ARGOS Group (www.argos.org.nz) – as part of the New Zealand Sustainability Dashboard project. All publications can be found on the website nzdashboard.org.nz. However, Internal Reports could not be published on the website.

The New Zealand Sustainability Dashboard project Research Partners



Executive Summary

Sustainability assessment to future-proof New Zealand's agriculture

Sustainability assessment of New Zealand's agriculture at first glance has one simple goal - to keep our farmers farming. However, confronting how to achieve this quickly gets complicated. Efficient, prosperous and environmentally friendly farming demands knowledge and skill, and application of new tools, that must be constantly updated and enhanced. Securing market access depends increasingly on showing faraway customers that the food we produce is safe and nutritious and has been produced in an ethical and sustainable way.

The New Zealand Sustainability Dashboard (NZSD) project has created and tested a variety of tools to make sustainability assessment more efficient and effective. In the past six years (2012-2018) it deployed prototype tools in five sector case studies (wine, kiwifruit, irrigated mixed agriculture, Ngāi Tahu farms and wild food harvests, Māori forestry) and helped other organisations plan their own process including HortNZ, Beef+Lamb New Zealand and Aquaculture New Zealand.

Sustainability assessment requires seven recurring steps to make it efficient, effective, and adaptive. Description of a seven-step process breaks a potentially bewildering concept into more manageable components to avoid "paralysis by analysis". This report is structured using this seven-step model.

Sustainability is more like a journey than a destination. It is helpful to focus on the process of improving sustainability and resilience (a journey) rather than becoming fixated on whether we have arrived yet (the destination). Attention to journeying builds confidence and avoids risk of becoming overwhelmed and dispirited by uncertainty and multitude of potential threats ahead.

Demonstrating rewards keeps people committed to improving sustainability. A sustainability journey is more likely to be maintained if it delivers immediate and tangible rewards for the main actors i.e. the growers, producers, at one end of the supply chain, marketers and strategists in the middle, and consumers at the end. Sustainability is not just about securing 'good' to be collected later by unknown others - it is also about capturing rewards for producers, right now. We recommend early investment in demonstrating the economic benefits of sustainability so that actors are encouraged to participate.

Sustainability assessment is improving steadily. Methods are becoming more standardised, comprehensive and trusted and increasingly demanded of producers by markets, regulators and local communities.

Tools to help are available. More powerful, flexible and less expensive monitoring tools for assessment and reporting across multiple scales have emerged within just the six years of the NZSD project. Sustainability assessment requires selective application of a whole suite of tools at different stages and according to what is discovered as the journey unfolds. An indicator framework provides a broad terrain map to make sure all threats and opportunities are considered; prioritisation and decision support tools ensure the measurement of the most important things in the most cost-effective way; benchmarking and target setting protocols to measure progress and incentivise learning. Communication tools encourage all actors to be kept moving collaboratively in the same direction.

Co-design of locally relevant assessment criteria builds relevance and participation. The international and NZSD research is clear: importing a single or universal recipe for sustainable practice and assessment into a community of producers and processors is unlikely by itself to trigger long-term change for sustainability. The NZSD project findings urge instead a slower and more inclusive process from within the community, to build ownership in the initiative so that all actors see it as their own journey, initiated and navigated by them, and moving in a direction that suits their collective needs. Design of the programme must be informed by the producers' own knowledge and skill and be put into action by them. This reflects a fundamental respect of the producers, their needs, their identity, and their contribution to a prosperous New Zealand.

Note: All documents linked in this report can be found here: <https://www.sustainablewellbeing.nz/nzsd-library>

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Introduction





INTRODUCTION

The primary sector dominates the New Zealand economy. Total primary sector export revenue is forecast to be over \$42 billion for the year ended 30 June 2018 (MPI, 2018¹). Securing premium prices and market access for many primary product exports increasingly requires evidence of sustainability to support credence attribute claims of the products. New Zealand society is also becoming increasingly concerned about the environmental impacts of agriculture and the resilience of rural communities. Farmers and other stakeholders are also keen to monitor their performance across a broader range of performance metrics to ensure that they are meeting expectations in relation to social, environmental and economic performance, partly to secure exports and their social license to farm, and partly to learn how to continuously improve performance.

In response to these signals the New Zealand Sustainability Dashboard (NZSD) project was established in 2012. Creating a bundle of tools to encourage such incremental improvements by individual farmers became the main goal of the NZSD project described in this report.

The project's goal was daunting and urgent. Turbulence in global food systems and concerns regarding social and environmental impacts among consumers in international markets were identified as increasingly driving changes on local farms and demanding eco-verification of New Zealand Inc.'s "clean-green" assertions. The number of dimensions of sustainability to be measured has been burgeoning, becoming more complex. Sustainability must work across multiple scales and connect diverse stakeholders and it must be practical and interpretable by key decision-makers on New Zealand's land – the farmers themselves. The project identified the need for an open, scientifically defensible, and internationally recognised NZSD which would be embedded within global market accreditation systems as the main cross-scale linkage tool for future-proofing resilience of New Zealand agriculture.

This report provides a summary of the key lessons generated by the NZSD. Multiple links are provided throughout the report for those who want to delve deeper. The report is structured around the seven steps to sustainability the project identified. A high-level overview discussion, case

¹ <https://www.mpi.govt.nz/news-and-resources/media-releases/primary-sector-exports-forecast-to-rise-to-over-42-billion-in-2018/>

studies and recommendations are provided for each step. The report ends with a general discussion of the key lessons, drawn together from across all seven steps, to provide critical insights into the successful development of a sustainability initiative. A list of additional resources is provided including a range of policy briefs and research summaries that address significant issues of sustainable development and sustainability assessment.

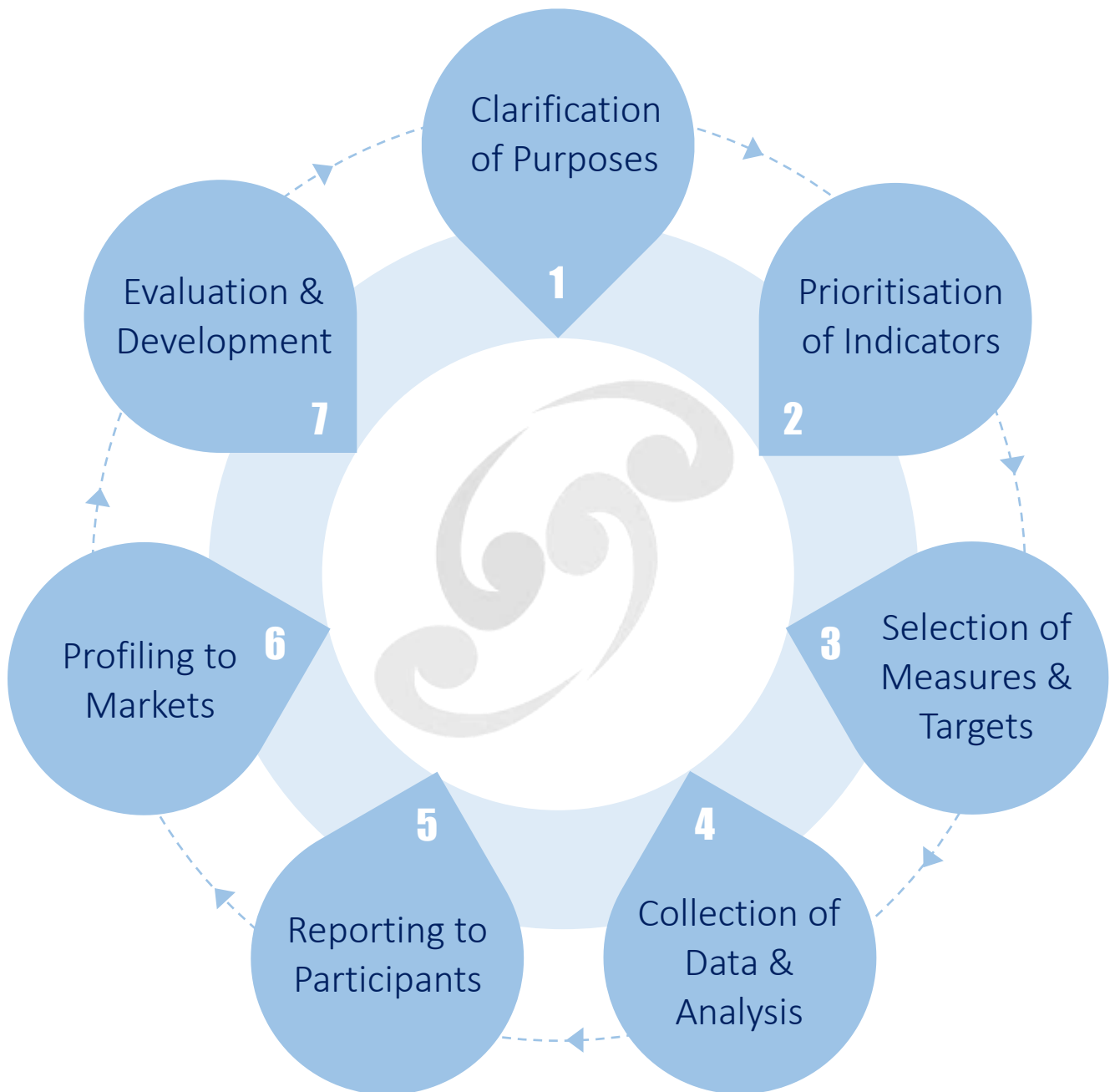
Seven Steps to Sustainability



The NZSD project has developed a seven-step process for organisations to consider, develop and implement a sustainability assessment and reporting system.

It can be a bewildering challenge to know where to start and a lot of time can be wasted when focusing on minor or irrelevant issues. The seven-step process helps segment this process, but it is not expected that all organisations will need to follow and include each of the steps.

CONTEXT



Key terminology used in this report

There's a whole new language around sustainability, so we first need to get some definitions straight. Terms like 'indicator' or 'tool' can have different meanings in different contexts. Below is a brief description of how some key sustainability terms are understood in this report.

System

A system is a high-level approach, it is used in this report to imply a set of principles or procedures according to which something is done. A system may be a method used to address the challenge of sustainability.

Tool

A tool is a device used to implement a method. The NZSD relies primarily on two types of tools; those used for developing/designing a sustainability assessment programme, and those used for implementing such a programme. The tools could be boutique software packages, designed by the NZSD, or combinations of existing systems that have been re-worked into a new tool. The following page gives an overview of different tools in the NZSD.

Framework

A framework is a supporting structure underlying a system. At the core of the NZSD is a framework which organises and connects a range of intended outcomes, objectives, and indicators which are intended to improve sustainability.

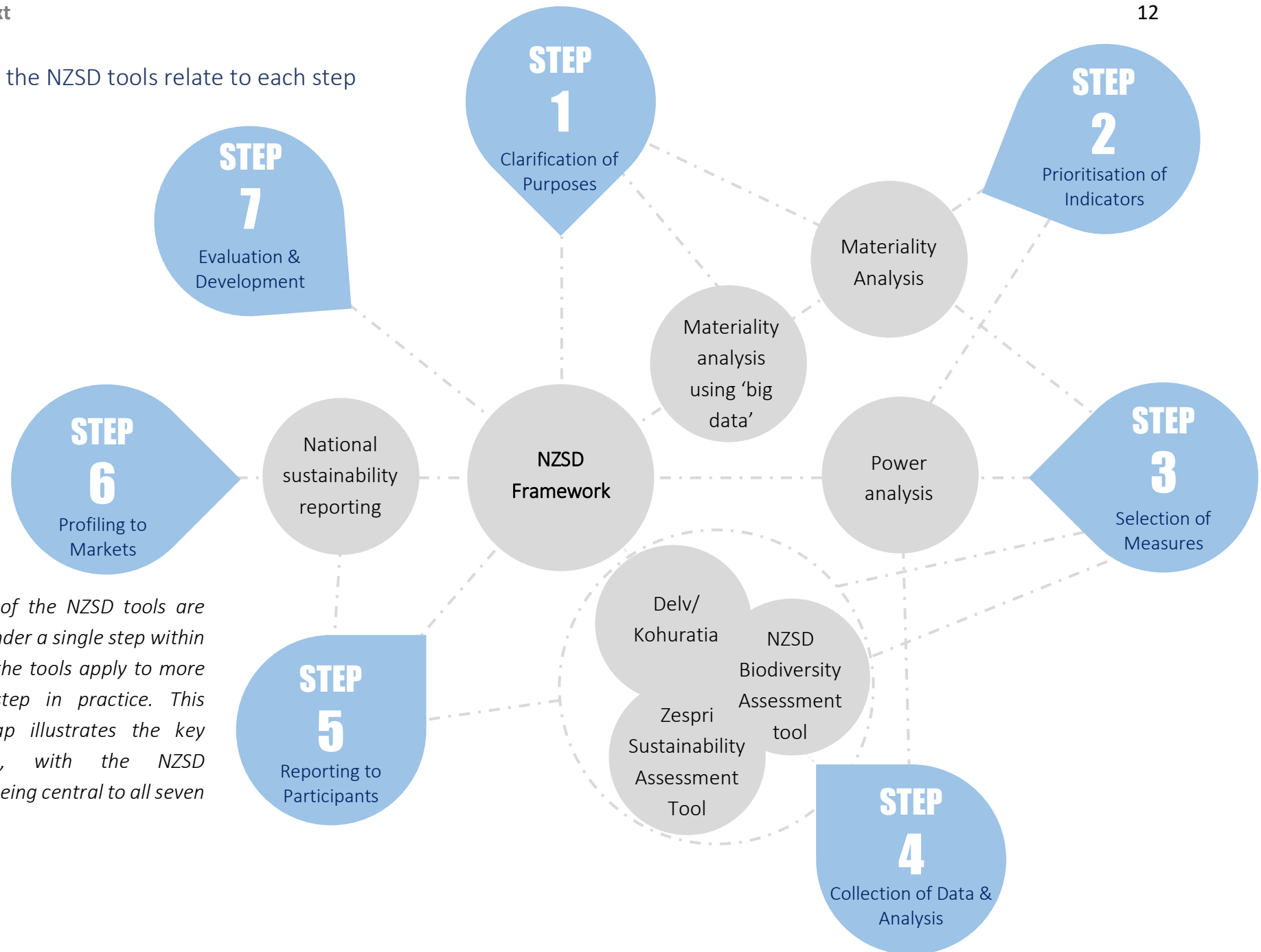
Indicator

An indicator is a device providing specific information on the state or condition of something. A key function of an indicator is to reduce the volume of information to which decision makers must attend.

Measure

A measure is a specific metric used to determine performance against an indicator. An indicator can have several measures. For example, the indicator 'Water Quality' will require multiple chemical, biological, and cultural metrics to assess it.

How the NZSD tools relate to each step



While each of the NZSD tools are presented under a single step within this report, the tools apply to more than one step in practice. This network map illustrates the key relationships, with the NZSD framework being central to all seven steps.

1 Clarification of Purpose

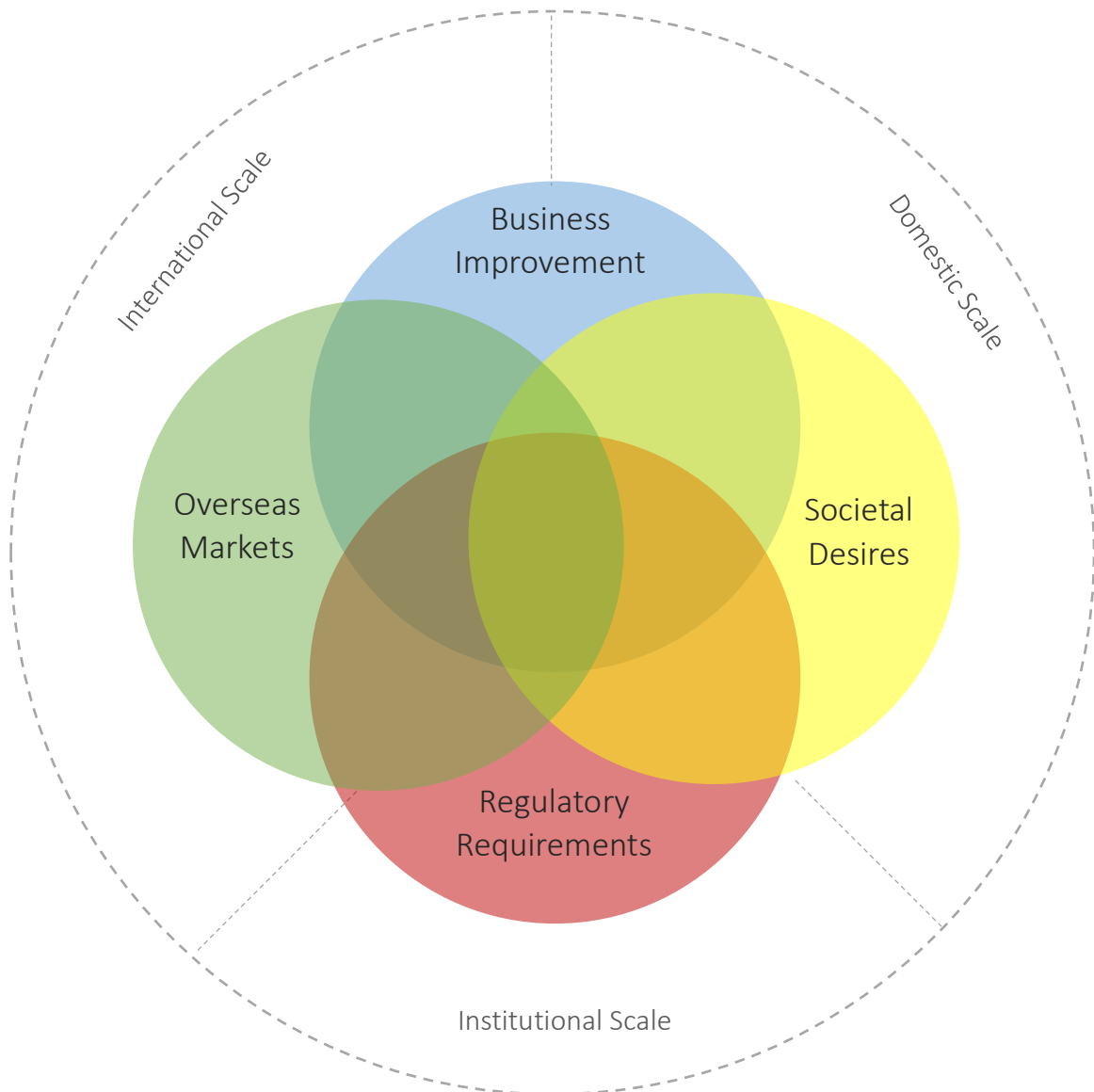




CLARIFICATION OF PURPOSE

Organisations are facing an ever-increasing number and expanding range of internal and external pressures to record and report on sustainability. They all share common goals to improve performance and efficiency, to build preparedness and resilience to shocks, and to nurture adaptability to capture future opportunities and avoid threats.

To achieve clarification of purpose for introducing a sustainability assessment and reporting system, a first step is to clarify the drivers for it. Understanding the pressures you face helps optimise your responses to them. You will probably need to start by a critical evaluation of the values and goals of your organisation so that you can build motivation and co-ordinated action amongst all the stakeholders and decision-makers. The primary drivers of business sustainability are illustrated below. Each driver can occur at a different scale, and all overlap in some way. A more detailed breakdown of the drivers can be found [here](#).



Each production sector is likely to experience different drivers and so emphasise quite different parts of the overall sustainability assessment framework and select different tools to put it into practice.

CASE STUDY



Priority drivers for optimum design of New Zealand production sectors' sustainability assessment.

The five main NZSD case studies identified quite different drivers for their investments in sustainability assessment i.e.:

Case Study	Principle Sustainability Driver	Secondary Sustainability Driver
Forestry	Social/cultural	Market
Irrigation	Regulatory, Environment	Cultural/Social
Kiwifruit	Market	Business improvement
Ngāi Tahu	Cultural/Social	Business improvement
Wine	Market	Business improvement

There is no one tool, one framework, or one indicator set that is appropriate for the different purposes and contexts of sustainability assessment. Apart from having a clear vision of one's purpose, the process of creating the assessment framework also emerges as important: if the key stakeholders are not given a responsible and full role in the development of any assessment tool, it is less likely to be fit for their purpose and they are unlikely to take ownership or have confidence in it.

Three key ideas should be kept in mind when considering drivers of sustainability:

1. Sustainability encompasses a wide range of goals,
2. Different drivers affect priorities given to these goals, and
3. Key stakeholders should be involved to decide on priorities.

Sustainability reporting has become common practice among large corporate businesses and with that the need for smaller size companies or even single producers to follow the trend has emerged. Drivers for sustainability reporting can be regulatory requirements set by national or

local governments or industries. Consumer attitudes and agri-environmental policies in overseas markets as well as the opportunity to improve business strategies and operations through sustainability assessment are also key influences for sustainability reporting. It is crucial to an organisation to identify its main drivers because different purposes or reporting contexts require different assessment frameworks and sets of indicators. Before an industry or a company chooses what and how to measure and report on, it should clarify the reasons for doing so – the purpose.

RECOMMENDATIONS



The NZSD project highlights the importance of two aspects when identifying purposes and beginning the sustainability journey:

1. It is vital that all participants that will be affected or are expected to contribute to the sustainability programme are included in the development process from an early stage. It has been shown that motivation and commitment amongst participants is higher when responsibilities are considered to be fairly distributed and when collective actions are emphasised. If individual farmers see themselves as part of the solution of sustainability, not the problem, they are more likely to be motivated to contribute and engage actively.
2. It is equally important to shift the focus from a performance-based assessment in order to comply with external demands to a value-added approach that emphasises the benefits of sustainability assessments for the company or the farmers.

2 Prioritisation of Sustainability Action Areas





PRIORITISING SUSTAINABILITY ACTION AREAS

There are many potential sustainability issues that an organisation could address. However typically, limited resources mean that the identification of a small set of priorities that an organisation will focus on, needs to be made. A prioritisation process helps to establish the requirements for adopting sustainability indicators as well as identifying the important gaps in an organisation's sustainability trajectory. The selection of priority action areas also needs to align with an organisation and its internal stakeholder perceptions of sustainability priorities.

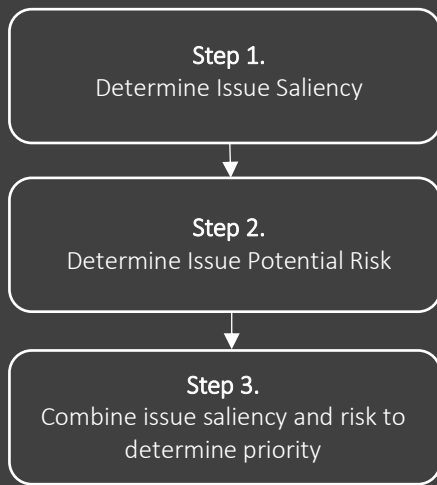
Materiality analysis

Materiality analysis is a process used to ensure that an organisation is focusing on issues that have a direct or indirect impact on an organisation's ability to create, preserve or erode economic, environmental and social value for itself, its stakeholders and society at large. The identification and prioritisation of sustainability issues for an organisation to target ensures that resources committed to sustainability assessment are efficiently deployed and targeted.

There are also external resources that have identified and prioritised sustainability issues. In some cases, these have been incorporated into the requirements of assurance or product accreditation programmes.

Sustainability prioritisation support processes

The materiality process helps with an external analysis and prioritisation of sustainability issues; however, this needs to be aligned with an organisation's stakeholders' perceptions and priorities. Tools to facilitate this process that support a consultative and open process to improve an organisation's own sustainability priorities have been developed.

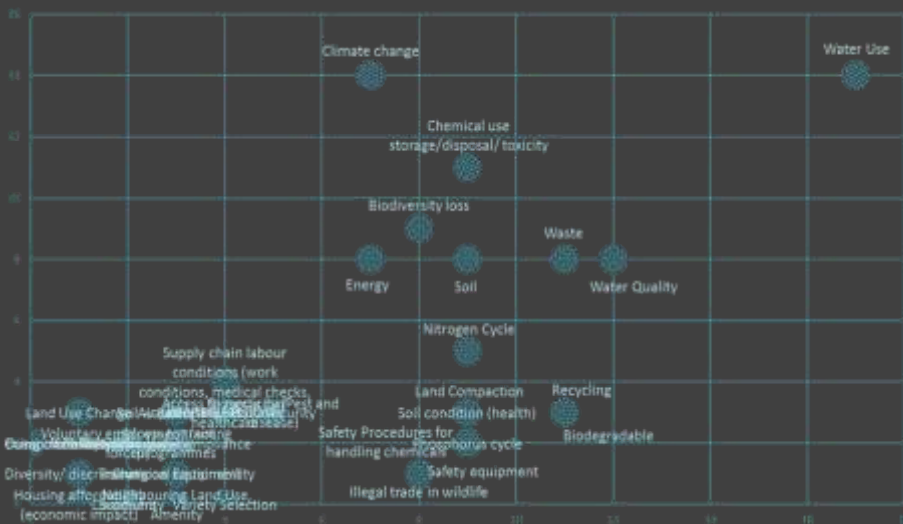


Materiality Analysis

The project has developed and trialled different approaches to conducting a materiality analysis and has formalised processes in the scientific literature.



The original prioritisation process developed by the project used meta-analytic and content analysis techniques to assign materiality rankings to a range of sustainability issues. The process drew on multiple information sources including surveys, policy documents, scientific journals, and industry reports, amongst others. The formalised materiality assessment process followed three steps as shown in the flow diagram.



The methodology was trialled with the New Zealand wine sector and then the Kiwifruit case studies. The approach was also piloted with other sector organisations including Horticulture New Zealand to review their NZ GAP programme. More Detailed information on the process can be found [here](#).

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Materiality analysis using 'big data'

TOOLS



This approach involves using 'big data' from internet search query records to determine the importance of different sustainability issues, across different countries, and over time. This approach is demonstrated in the [NZSD National Dashboard](#).

It is based on the use of the millions of Google searches and currently reports on public interest in 64 different sustainability issues that have been mapped across eight countries. The data is then analysed, and trend lines are fitted using statistical functions. Aggregate search data, per capita search data, and trends in searches over time, can be used to both establish the importance of different sustainability issues across different cultural contexts, and forecast future important topics for organisations to address. This information has the potential to be a powerful aid in setting organisational sustainability strategies, and tailoring sustainability reporting to public concerns. The data are presented in [interactive dashboards](#) alongside contextual information.

Sustainability prioritisation support processes

Materiality analysis provides insights on priority sustainability issues that should be addressed by an organisation. These findings also need to be aligned to an understanding of an organisation's stakeholder perception of sustainability priorities to ensure that they are relevant to the organisation's context and are subsequently understood and supported. The project developed a [prioritization process involving Discrete Choice Modelling](#) (using the '[1000Minds](#)' PAPRIKA tool).

Choice modelling shows considerable promise for measuring priorities in a scientifically robust, transparent and repeatable way that minimizes the risk of greenwash, builds trust amongst stakeholders and keeps the assessment investment grounded in practical ways of benefit to local growers.

Kiwifruit industry professionals used this method to determine which stakeholders should have the most influence on sustainability assessment priorities. They also used the method to prioritise criteria when setting targets for sustainability performance improvement. The tool was also used to assist Beef & Lamb New Zealand with their environmental strategy priority setting.

RECOMMENDATIONS



There is a vast variety of sustainability issues an organisation could report on. To use its resources in the most effective way and to create meaningful impact, an organisation needs to prioritise sustainability indicators that reflect its context and its stakeholders' interests. It is recommended to:

1. Focus on a limited number of sustainability issues and create meaningful and lasting impact in the prioritised areas, rather than trying to tackle every single issue at once.
2. Undertake a materiality analysis to determine the importance and urgency of an issue and to identify its possible risks on the organisation and its stakeholders.
3. Involve a broad group of internal and external stakeholders in the process of prioritisation. Results from big data, like accessible google search data, can be useful to identify important issues in different countries and more general trends regarding sustainability. A materiality analysis using big data can help to tailor sustainability reporting to public concerns.
4. Assess the relevancy of prioritised sustainability issues to an organisation and its context using choice modelling tools.

3 Selection of Measures and Targets





SELECTION OF MEASURES AND TARGETS

Following the identification and prioritisation of sustainability action areas, measures need to be selected. For each chosen indicator, agreement is needed on how to measure its status. It's fundamentally important that each indicator and its measure(s) are linked directly to a comprehensive and underpinning attainability framework. This locks in relevance, keeps focus on the prize, links the information to broader sustainability concepts and emphasises a systems approach to sustainability.

In this part of the process, it is determined how exactly sustainability is measured and against which targets the results of the assessment will be compared. Selecting measures and targets does not only determine what is environmentally, economically and socially sustainable. It also defines how cost-efficient the sustainability assessment will be.

Selection of an appropriate sustainability framework

There are several conceptual sustainability assessment models reflecting different views on sustainability and the way the world works.

- The capital approach borrows from the concept of capital from economics and broadens it to include other elements that are relevant to human well-being. Statistics New Zealand have used this approach many times to measure things such as New Zealand's progress towards sustainable development.
- The systems approach aims to measure sustainable development by measuring the whole system (environmental, economic, and social) completely. It emphasises that nature, society, and the economy are interdependent parts of a complex system (e.g., Response Inducing Sustainability Evaluation (RISE)).
- A theme-based approach groups indicators into various issues or themes that are typically determined on the basis of policy relevance. [The United Nation's Sustainable Development Goals \(SDGs\)](#) are formed from a theme-based approach.

Most indicator frameworks are based on the use of three pillars of sustainability - environmental, economic and social. A wide variety of frameworks are available that place emphasis or themes or approaches of importance to their designers and participants. Often the same general concepts are expressed differently in culturally or locally nuanced ways that build relevance, understanding and participation.

The measures form the base of a pyramid and are nested within a particular indicator. The best frameworks then join related indicators into an identified objective, which in turn contribute to a higher order outcome and goal. Laddering the components in this way helps understanding and the language of objectives, outcomes and goals serve to continually

remind the participants of the prize - the reason why something is being measured. Nothing will discourage the users more than being asked to measure something that seems to have no purpose or link to their own chosen goals.

TOOLS



NZSD Framework

Though there are many international agriculture indicator frameworks it was identified that some New Zealand stakeholders may require a resource that:

- Provides an indicator set grounded in New Zealand’s economic, environmental and social context;
- Ensures that the indicators operationalised by New Zealand food and beverage producers could match international market accreditation criteria and scope;
- Demonstratively meets expected scientific standards to dispel any suspicion of “greenwashing”.

As a result, the project developed the NZSD Framework to provide a process to assist New Zealand stakeholders to select appropriate sustainability indicators that align with sustainability objectives and goals.



The NZSD Framework was reviewed by the TempAg Research network which compared the scope, goals and tools of 53 agricultural sustainability assessment frameworks, metrics and tools from temperate regions. Their review found that the NZSD framework covered (or achieved) unusually well, in its stretch to cover a wide agenda and enable participation at multiple levels (farmers and policy makers, business enterprises and public agendas).

Sustainability Indicator/Measures

[Statistics NZ](#) define an indicator as “a summary measure related to a key issue or phenomenon that can be used to show positive or negative change”. The evaluative nature of an indicator distinguishes it from the descriptive nature of statistics. Indicators are measurable aspects of a project/environment/society that can be used to monitor its progress and direction. A key function of an indicator is to reduce the volume of information to which decision makers must attend. The [Compendium of Sustainable Development Indicator Initiatives](#) includes more than 600 efforts at measuring sustainability. [There are different types of indicators](#) including:

1. Context indicators, which reflect the state of the economic, social or environmental situation of the territory in which a farming/fishing/forestry (etc.) enterprise is situated.
2. Practice indicators, which measure the adoption and utilization of ideas and technologies within a farming/fishing/forestry (etc.) enterprise that have proven impacts in improving social, environmental, and economic outcome.
3. Performance indicators, which measure the actual environmental, social, and economic performance of a farming/fishing/forestry (etc.) enterprise resulting from its practices. For example, water quality, profit etc.

Sustainability Targets

Sustainability targets or reference values are the ‘targets’, ‘benchmarks’, ‘critical thresholds’ and ‘tipping points’ against which the current state of a farming system is compared to make some overall judgement of its sustainability, risk and resilience. Care needs to be taken in the selection of targets to ensure that they align with the attainment of sustainability goals as well as being able to be effectively monitored. Many targets are implicit and embedded within the way ratings or standards are measured rather than explicitly derived from external information or processes.

Tools for reliable interpretation of performance indicators

Tools are available to formally predict the ability of measures to detect trends in sustainable performance or the success of a sustainability management intervention. They help to ensure scientific robustness of the monitoring and its interpretation, and to optimize investment in

monitoring by measuring enough times and to sufficient accuracy to make risk management reliable.

Indicator and Measurement Selection



The NZSD project identified 11 'best practice' design and selection criteria for indicators and measures, and a further 12 considerations to optimise the balance of the overall suite of indicators. Several of these criteria concerned safeguarding scientific rigour (e.g. repeatability, quantification, precision) while others covered their usability and ability to incentivise sustainability transformation (e.g. forward focus, communicability).

Rules of thumb to make indicators and measures most cost effective include:

- Spend most effort on getting reliable and accurate measures of those issues that are most salient or likely to occur.
- Spend most money and producers' time on getting reliable and accurate measures of those issues where the cost of changed agricultural practice is highest.
- Performance-based measures are preferred in most instances to practice-based ones, but they might involve considerable expense and need technical experts.
- Use a relative index of performance rather than an absolute measure unless the latter is needed – a relative index is usually much less expensive and often will be fit for purpose to monitor improvement.
- Separate precision and accuracy when designing measurements; a precise index that is not disrupted by local nuisance variation may be perfectly adequate for trend detection and need not be an accurate measure of farming activity or system. A measure that assesses whether some critical boundary or threshold has been breached must be both precise and accurate and is likely to cost a lot more.
- A rapid practice-based measure may be worth including if the issue is considered secondary in importance.
- An evidence-based rapid ranking method that links practice to proven outcomes has intermediate cost once deployed but is expensive to develop - it is therefore most appropriate for issues of intermediate importance or where the alternatives are particularly expensive.
- When possible, check the power of the monitoring method to detect the level of change that is of concern or desired - The ['simr' tool](#) helps fine-tune sampling intensity so that just enough is invested to assess the threat or capture an opportunity.
- Fast moving and naturally variable components of a farming system and agro-ecosystem demand more monitoring than slow moving ones.

Target setting best practices

CASE STUDY



The project undertook research into the establishment of sustainability targets and the subsequent development of best practices for target setting. We first established a stratified random selection of 186 indicator metrics and their reference values from 12 sustainability assessment frameworks in operation around the world.

There was a preponderance of practice-based rather than performance-based measures. Many targets were implicit and embedded within the way ratings or standards were measured rather than explicitly derived from external information or processes. Ratio scales were rarely used for indicator measurement, so targets were often blunt and qualitative tools for incentivising continuous improvement.

Given these limitations, we concluded that most assessment frameworks are weak tools for the comparison of agricultural sustainability between sectors, regions or nations. We therefore shifted emphasis to focus on targets rather than just the measures themselves. A choice model conducted by kiwifruit growers, processors and industry strategists demonstrated that *importance for sustainability* trumped all other criteria when setting targets for sustainability performance improvement. Building in considerable *stretch* was next most important, even if that compromised *immediacy* of achieving the targets, or the *achievability*.

An emphasis on fairness emerged from our high-level appraisal of literature on 'Common but Differentiated Responsibility' and 'Respective Capabilities' which has emerged mainly from ethical debates applied to international climate change mitigation efforts. We conclude that not all farmers can attain the same sustainability performance, so it is important to benchmark against comparable producers and to incentivise change by setting different targets for different circumstances.

The design of a sustainability programme and the establishment of targets and commitments is also influenced by the values and principles of fairness in relation to the allocation of responsibilities. Fairness or justice is a major concern for all people. If a process is not considered fair, people will not support the process. While there is a growing trend towards improving agricultural sustainability, the implementation and uptake of sustainability initiatives can be improved if burdens imposed on those expected to participate are perceived as fair.

The project undertook research to develop a deeper understanding of the philosophical basis for the development and operation of sustainability assessment systems. The following insight addresses this point.



INSIGHT

Improving Environmental Sustainability Uptake through Attention to Perceived Fairness.

NZ horticulturalists prefer to sacrifice some overall industry efficiency in the interest of promoting a more egalitarian distribution of burdens between growers for corrective action to achieve overall sustainability.

Some significant insights into how New Zealand farmers think that the burden of sustainability should be shared include:

- Farmers who are struggling financially should be granted some leeway when setting environmental targets.
- Farmers who are contributing little effort to improving their environmental performance, should get higher environmental targets.
- Farmers who are operating in a more challenging environmental context should not be granted a more lenient target.

By developing an understanding of what is considered a fair way to distribute burdens in a sustainability initiative, it is possible to improve the motivation of the participants to improve their own performance.

More information can be found [here](#).



TOOLS

Power analysis tool

Is our monitoring design fit-for-purpose? If not, should we monitor for a longer time period, monitor more farms or more intensively within farms? Or stop monitoring altogether?

We designed a tool to help you address these questions. The tool allows you to assess the ability of different monitoring designs to detect specified trends or changes in your sustainability metrics within a specified timeframe. You can thus ensure your sustainability monitoring designs are cost-effective.

This tool is freely available online, as an [R-package called 'SIMR'](#). Within three years, the tool has been adopted by multiple disciplines globally, with over 15K tool downloads and 100 journal citations for the accompanying [tutorial paper](#). This tool was developed by [Manaaki Wheuna – Landcare Research](#).

RECOMMENDATIONS



To find a balance between scientific reliability, completeness and economic viability, it is recommended to:

1. Select a sustainability assessment framework that is scientifically sound, aligned with international standards and accreditation schemes, and acknowledges the economic, environmental and social context specific to the organisation's country or region, like the NZSD Framework
2. Consider the costs and resources involved in measuring sustainability. Issues with high risk or rich rewards, or issues that are particularly urgent, should be prioritised for measurement. Indicators that trend relatively quickly require more regular measuring and monitoring than slow moving issues. Only measure each one as accurately and precisely as required so that more resources remain to adequately track additional risks and opportunities.
3. In most cases, favour performance-based measures over practice-based ones, as well as a relative index of performance over an absolute measure.
4. Undertake a power analysis at the outset to ensure that you invest just enough to reliably detect a significant level of change and/or to assess the effectiveness of your intervention. Your measures must be sufficiently reliable to be able to learn from and optimise your sustainability actions.
5. Select targets that align with the overarching sustainability goals and meet the following requirements: locally grounded and internationally relevant (alignment with both international and national goals), scientifically sound, relevant, useful and affordable for stakeholders.
6. The last aspect relates to the level of fairness which was found to be very important for participants, i.e. benchmark individual participants to comparable colleagues and adjust targets according to circumstances.

4 Collection of Data and Analysis





COLLECTION OF DATA AND ANALYSIS

After establishing which indicators to measure and the metrics that will be used to measure them, the next step involves the collection of data. There is the potential to collect a large amount of data from any sustainability assessment process. The management of this data can determine the value that can be obtained from it.

Data collection and reporting systems

Sustainability assessment will return more value if the numbers can be aggregated and synthesized across agricultural sectors, sustainability pillars (economic, environment, social, and governance) and across varying scales (farm, catchment, region, nation, markets).

Collecting the numbers is just the beginning - to make sense of them they need to be aggregated, interpreted and presented in a way that all the affected parties can help figure what it all means and what if anything needs to be done to improve or grab new opportunities. Too much data sits unused, which just frustrates the contributors and wastes resources, so make sure you plan for the costs and personnel needed to extract the main lessons - you may need some expert consultants or statisticians for the tricky analyses, but make sure some of your own team work with these helpers to keep the resulting recommendations grounded and practical.

There were three primary data collection and analysis tools developed by the NZSD which are detailed in the following boxes:

Delv/Kohuratia



TOOLS

The supreme advantage of the Kohuratia tool is its flexibility to perform sustainability assessments at small or large scales. The assessments are made-up of modules that explore multiple elements of an organisation's activities including their governance, communications, trust, health and safety, financial management, people management, farming practices, environmental practices, and cultural values.

A light version of the application is [publicly available](#) for any organisation to use and work on adapting it for generic use (non-Māori organisation use) is also underway.

TOOLS



NZSD Biodiversity Assessment tool

This [online calculator](#) allows farmers to rapidly self-assess the expected biodiversity outcomes of their farming practices. The tool only includes farm practices and biodiversity groups that New Zealand agricultural sectors, NGOs and government agencies identified as deserving emphasis on New Zealand farms. Biodiversity scores were derived by panel consensus, where New Zealand biodiversity specialists used their expert judgement to classify each practice as more or less beneficial for biodiversity.

A more rigorous assessment of biodiversity scores is recommended to enhance the current tool design. This could be achieved by systematically evaluating the global scientific literature for evidence that specific farm practices deliver desired biodiversity benefits. New Zealand farmers and their markets will then be assured that their biodiversity performance rating is founded on the highest quality evidence.

This tool was developed by [Manaaki Wheuna – Landcare Research](#) working in partnership with [Cool Farm Alliance](#), [Conservation Evidence](#) (University of Cambridge) and [University of East Anglia](#).

TOOLS



Zespri Sustainability Assessment Tool

The base source code developed for the Zespri (kiwifruit growers) sustainability assessment tool is also available under licence and can be adapted to support other organisations' sustainability programmes. The tool makes it easy to enter data, compare performance between orchards, and track progress on individual orchards. A coalition of irrigated farmers in Canterbury have co-opted the tool and added auditing functions so that the industry advisers and policy makers can more effectively guide it's members to more sustainable practice and easily demonstrate improvements to markets and regulators.

Data ownership, governance and sharing

Ultimately the objective of any sustainability assessment programme is about making changes when and where needed and therefore, the results must be shared with the participants and other parties. There are however issues in how to facilitate and encourage the multiple use of data in a safe and cost-effective way. Understandably, some data contributors will want assurance that data will not be misused. Data collected for one purpose may not necessarily be usable in a scientifically

robust way for other agendas, or when separated from the context in which it was first gathered.

Standards and tools to help facilitate the sharing of data are also required however, data governance and interoperability in the agricultural technology solution space is still at an early stage in New Zealand. Efforts such as the [New Zealand Farm Data Standards](#) and [New Zealand Farm Data Code of Practice](#) are early attempts to grapple with the challenges of dealing with complex data ownership, security and stewardship concerns related to farm data. The availability of open standard Application Programming Interfaces (APIs) in sustainability information tools appears to be at a very early stage, if not entirely non-existent.

Data ownership and governance

CASE STUDY



The NZSD established a partnership with the Cool Farm Alliance and collaboration with the Data Ethics Group at The Alan Turing Institute (University of Oxford) and the GODAN Institute (the Global Open Data for Agriculture and Nutrition) that led to a research stream on data ownership and sharing and its ethical and societal implications.

The project also engaged with the NZ Data Futures Partnership, an independent ministerial advisory group mandated by Cabinet to engage with citizens, the private sector, and non-government organisations to help drive change across New Zealand's data-use ecosystem.

The project has also reviewed the potential for agricultural sustainability data being part of a "[data commons](#)." The data commons model recognises that data can be infinitely reused without diminishing its value to anyone, including the initial source of the data. Data can be a common pool resource rather than a private good. The principles of a successful data commons include: an industry's data can be used by others while remaining of high value to them; their data is technically secure; data reuse is controlled by a trusted entity; and no use is excluded as long as it adheres to the rules and principles of the commons. Links facilitated through the The Sustainability Consortium resulted in the identification of the International AgGateway programme to possibly facilitate a 'data commons' in New Zealand. The establishment of a New Zealand Sustainability Assessment and Reporting Data Standard could potentially overcome barriers of adoption and interoperability between participants and accelerate innovation and development. Progress has been made in other agricultural data standards in the last four years, like the recently published New Zealand Farm Data Standards. However, current initiatives don't include sustainability data. An alignment with the NZSD project could be explored and any standards development should be integrated with international initiatives, in particular the AgGateway consortium and the EU INSPIRE initiative. Additionally, codes of conduct need to be broadened to allow secure and reliable sharing of sustainability data with regulators and stakeholder groups, as well. More information can be found [here](#).

RECOMMENDATIONS



To ensure that sustainability data can be used efficiently and in a secure and reliable manner, it is recommended to:

1. Choose appropriate technology according to own context, budget and users' needs. Sustainability assessment tools can be integrated into already existing platforms, off-the-shelf solutions can be applied as they are or customised, or the right tool can be built from the ground up.
2. Set up mechanisms to facilitate data exchange between participants as well as regulators and other stakeholder groups. Open Data Standards for Agricultural Sustainability will accelerate sustainability outcomes, progress and innovation. Their development should therefore be encouraged. Simultaneously, work to establish a broad code of conduct to ensure that data rights are properly respected.

5 Reporting to Participants



Reporting is a crucial element of sustainability assessment because it illustrates performance and areas of improvement or deterioration. Giving feedback to participants of the sustainability programme or to whole industries or public authorities facilitates a learning process and increases the levels of participation and ownership of the programme. Sustainability assessment provides participants of local vineyards, farms or orchards with individualised reports that can be used to compare current results with data from previous years or benchmark current performance with that of other participants. The individual report presents an opportunity to experiment in the search for best practices and enables a better understanding of local constraints and opportunities. At a national or industry level, the aggregated data can be utilised as large scale and collective experiments.

A key insight from the NZSD project has been the benefits associated with providing feedback to participants of sustainability programmes on their own and others' results. This increases the direct benefits to users of the programme that have often been used only for compliance purposes and increases the levels of participation and ownership of the programme.

From sustainability compliance to sustainability learning and transformation

- *Individual whole farm learning-by-doing experiments:* The 'whole farm' is the key site of action and decision making for sustainability. Growers and managers of such sites are continually trying their own local 'management experiments' as they fine tune their own production to local constraints and opportunities.
- *Industry-level policy interventions:* By upscaling and analysing results at regional and national industry stages, industry facilitators and policy makers can conduct more large scale and collective experiments to future-proof their sector.



Sustainability - decision support tools

The NZSD developed multiple tools to support decision making at both a farm level and a strategic level. For example, Individualised vineyard and winery reports, covering energy use, water, and plant protection, are now an integral part of the [Sustainable Winegrowing NZ programme](#). The data collection scorecard and spray diaries have transitioned from compliance to become a valued learning tool.

Benchmarking Reports – Wine and Beyond

CASE STUDY



Individualised benchmarking reports generated for members of Sustainable Winegrowing New Zealand (SWNZ) have had success in prompting continuous improvements in plant protection, energy and water use. This success in the wine industry has now been demonstrated to other industries, which have begun to develop individualised benchmark reporting programs of their own via the NZ Sustainability Dashboard.

Individualised reports compare performance tuned against a catchment, region, or similar winery size. One of the outcomes from the reports is to engage members in a topic by benchmarking their performance, then once engaged to link them to learning resources, and consequently drive action. 41% of surveyed wine members stated that they have discussed the reports with someone else and 26% attributed a practice change to the reports. Other industries have begun to adopt this practice

- The pipfruit industry, through New Zealand Apples & Pears, has launched a pilot project to present individualised benchmarking reports based on spray diary data to its members. Two prototype reports were generated in November 2018, focusing on disease resistance management and application rates of commonly applied chemicals.
- The application of individualised benchmarking and the resulting management changes has also been used as the premise for an analysis of benefits for the on-farm decision support tool OverseerFM.
- Other industries, including HortNZ and NZGAP, have also expressed interest in establishing similar benchmarking and reporting programs.

Adoption of sustainability reporting tools can be challenging in an environment where food producers must report to a variety of assurance systems. The clear benefits that can be provided by a sustainability programme above other forms of reporting, like benchmarking and the industry interventions previously described, require it to be used by a substantial proportion of producers across an industry. Suggestions for adoption are outlined in Step 7 but can also be incorporated into reporting strategies.

We found that when benchmarking reports were combined with mechanisms that allowed producers to guide the sustainability program, some producers demonstrated leadership roles in sustainability decision-making and used on-farm experimentation to support their roles in the program.

Learning Tools



INSIGHT

A shift from assessment to learning: continuous improvement for transformation was always the long-term goal of NZSD and turning the monitoring from a compliance requirement (someone else's agenda) to a learning focus (the grower's agenda) is expected to build participation and ownership of the sustainability responsibility and opportunities.

Understanding **why** a given distribution of sustainability KPIs is occurring is necessary so that we can identify **what to do** to remove risk and capture benefits.

- *Individual whole farm learning-by-doing experiments*: The fundamental unit of replication built into the NZSD is each individual vineyard, winery, orchard, pack house, farm or wild food gathering place. The dashboard imposes a structured monitoring procedure on such local experiments and reflects them back to the decision makers so that they can (i) compare performance after their intervention for the previous years, and (ii) benchmark their new performance against their colleagues (this acts as a 'control' or 'reference' comparison to improve learning).
- *Industry-level policy interventions*: The dashboard aggregation at regional and national levels has been facilitated with the case studies for example.
- Aggregation of nutrient losses for all the Rangitata Diversion Race Management Ltd. (RDRML) irrigators to conform with the conditions of their resource consent.
- Aggregation of regional and national chemical inputs for the NZ Winegrowers Tool.

Adoption insights



INSIGHT

We all receive information from a wide range of sources, making it very difficult to attribute change to one particular source. However, a grower survey pointed towards positive change from benchmarking using individualised reports. Also, more quantitatively we have observed improvements in plant protection practices amongst growers.

In 2014/15, 27% of blocks applied sulphur at less than the predicted minimum reliable effective rate. In the following season this improved to 17% potentially under dosing.

To estimate how much of an impact benchmarking reports may be having on this change those vineyards that were highlighted through their report as being above or below the target were compared with all other vineyards. The sulphur application rates of those vineyards that were below the minimum effective rate in 2014/15 increased by statistically significantly more than the average for all other vineyards. This is an important result that demonstrates the important role that individualised benchmarking reports can play in understanding and then helping to improve grower management practices.

RECOMMENDATIONS



The step of reporting sustainability data and performance to internal participants is an integral component of sustainability assessment. It is recommended to:

1. Consider as a first step to enhance reporting and benchmarking, the importing of existing data into one format or tool that can be extended over time to establish reliable insights and trends.
2. Take the opportunity of sustainability assessment to learn from the collected data and improve economic, social and environmental performance. Regulatory requirements are only a starting point for sustainability assessment as the most promising benefit of the sustainability process is the possibility to learn.
3. Prepare individualised reports for each participant that provide direct feedback and enable on-farm 'learning by doing' experiments. Making the reports individualised brings the numbers alive by making them personally relevant to the farm decision-maker.
4. Use reports to aggregate information at a higher level to identify general trends and industry risk.
5. Combine reporting as much as possible, with other reporting requirements and quality assurance processes
6. Report in a format designed in a way that can clearly feed into industry interventions and shared goals that can tell a story to overseas consumers
7. Provide reporting which can, and should, increase grower knowledge about their industry overall and in a way that supports participation in industry-level policy-making around the environment

6 Profiling to Markets





PROFILING TO MARKETS

Establishing systems to enable reporting to meet the interests and expectations of potentially a diverse range of stakeholders is a critical component of any sustainability programme. Reporting can be at a range of scales – from national level reporting to regional/local reporting of an organisation’s sustainability performance.

A sustainability report provides a record of the organisation’s sustainability performance and the progress it has made. It provides the basis for communicating results to local and overseas customers, governments, shareholders or distributors and can be used by the producers to further improve their practices and benchmark their performance against other farmers. The data from individual producers can also be aggregated at a national level to be used for reporting in the context of international initiatives like the United Nations (UN) Sustainable Development Goals or the Organisation for Economic Co-operation and Development (OECD).

National level reporting

The formal reporting of national sustainability performance is a relatively recent development with significant national reporting initiatives including the:

- UN Sustainable Development Goals
- OECD environmental reporting

In addition to formal reporting there is an emerging trend towards countries establishing sustainability reporting programmes to support the countries ‘Green’ image/reputation. The Irish programme [‘Origin Green’](#) is possibly the best example and involves the reporting of sustainability of multiple primary sectors and manufacturers at a national level.

Organisational level sustainability reporting

An organisation’s sustainability programme can be used to present material to distributors and consumers in significant markets. This may take the form of an annual sustainability report, which tracks changes in performance of the industry each year.

[The Global Reporting Initiative \(GRI\)](#) is a tool used globally by organisations and companies to report on their sustainability performance. GRI is a non-profit organisation promoting economic, environmental and social sustainability. GRI works towards a sustainable global economy which should combine long term profitability with social justice and

environmental care. This means that organisations should cover the four key areas of sustainability: economic, environmental, social and governance performance. By reporting transparently and with accountability, organisations can increase the trust that stakeholders have in them and in the global economy.

CASE STUDY



Communicating sustainability attributes to customers

The research programme “Maximising Export Returns (MER)” by the Agribusiness and Economics Research Unit (AERU) at Lincoln University found that credence attributes in food and beverages are important to consumers and consumers are willing to pay a higher price for products with certain attributes.

The most important attribute among consumers (in China, India, Indonesia, UK and Japan) is food safety, followed by quality and nutritional value. Other attributes such as social responsibility, traditional cultures or environmental sustainability tended to be not as relevant for most consumers. However, if the connection of sustainability issues to the quality and health benefits of the product was made, the consumers’ willingness-to-pay increased. Sustainability credentials are often a signal for quality and wellbeing and therefore achieve higher premiums. A recent study about the attitude of Californian beef consumers and Chinese yoghurt consumers found that the highest premiums were captured for “100% grass-fed”, “100% pasture raised” and organic production, or enhanced food safety, organic production and environmentally sustainable production respectively. The most effective method of communication to the customer is product labelling that allows the customer to distinguish between products according to environmental impacts in addition to price and quality. Increasingly organisations are using social media as a means of direct communication to the customer without having to rely on partners in the value chain.

This piece of research also shows that sustainability assessment is driven by the need to manage reputational risk. Overseas customers consistently linked New Zealand with the ‘clean and green’ image and a country-of-origin label for agricultural products from New Zealand is seen as an important quality cue for credence attributes. Communicating this story to the customer is the most effective way of capturing price premiums and ensuring a competitive advantage.

National sustainability reporting



The NZSD project has also developed the [New Zealand National Dashboard](#). This provides an interactive platform to help explore and report on sustainability issues at multiple scales. The National Dashboard tracks sustainability performance across multiple sustainability metrics at different spatial scales. Users can interact and filter the data to satisfy their own particular interests.

Each data visualisation can be filtered and saved as a picture or a PDF for reporting or communication purposes. The National Dashboard seeks to improve the accessibility of important sustainability information. It brings together multiple reputable data sources in a way that is user friendly and suitable for communicating sustainability performance metrics to a wide audience. The National Dashboard draws on public data sets from major trusted organisations. The data is fed into a data analytics and visualisation software known as Tableau, which is used to analyse the data and create interactive dashboards. These dashboards are then uploaded alongside contextual information to [a website](#) currently hosted at the Agribusiness and Economics Research Unit at Lincoln University.



Explore some of the sustainability indicators from the National Sustainability Dashboard



RECOMMENDATIONS



When drafting a sustainability report, it is recommended:

1. To consider the target audience and align the reporting format and scope accordingly.
2. To report in line with a recognised global reporting framework like the GRI standard to ensure a level of harmonisation and comparability for international interested parties, and/or link with other market assurance programmes like GlobalG.A.P. The sustainability report should be transparent and include both success stories as well as challenges and failures (with an explanation) in order to be trustworthy and avoid being accused of 'green washing'.
3. To align reporting at a national level, if possible, so the industry can develop a coherent national approach to sustainability and communicate this as one voice and help futureproof its social license to farm.

7 Evaluation and Refinement



Consumer preferences, market regulations, scientific knowledge and commercial opportunities are evolving continuously. Consequently, sustainability is a journey. An organisation's sustainability programme should be regularly evaluated so that it continues to meet the purposes and adapt to meet new threats and capture new opportunities.

Monitoring and evaluation

As outlined, there are continual changes in the sustainability issues that an organisation needs to respond to as well as changing conditions within the organisation and its stakeholders that may influence the design and implementation of a sustainability programme. Tools to monitor these changing conditions and to assist in facilitating responses include:

- Materiality analysis as outlined in Step 2 (Prioritisation of Indicators) helps to identify the priority of sustainability issues and opportunities. A regular analysis of these helps to ensure that the programme is well targeted and relevant.
- Impact analysis – the analysis of the overall impact of the sustainability programme to the organisation as well as individual operators assists in justifying the resourcing requirements for the programme and possible opportunities for the targeting and enhancement of a programme.
- Stakeholder feedback – obtaining feedback from users and other stakeholders on issues with the use and scope of a programme is critical for the continuous improvement of the sustainability programme and ensuring that it is adapted and responsive to stakeholders' needs.

Broader assessment on metric selection impacts

There are possible implications from the selection of specific measures or metrics in sustainability assessment. These impacts are described in the concept of 'metrologies' as developed in the social science literature. Significant points related to metrologies include:

1. Metrics have potential to restructure practice, orienting good practice to the improvement of a selected suite of indicators.
2. Metrics can facilitate improved practice in terms of social, economic and environmental criteria but can also have an adverse impact for example by narrowing the focus of management, thereby obscuring the impact of processes or dynamics for which indicators do not exist.
3. In terms of achieving sustainability, further critique of metrics raises the issue of whether sustainability is 'measurable' and the



extent to which sustainability can be sufficiently defined such that appropriate metrics are identified and implemented.

Review of strategies to encourage adoption

The adoption of sustainability programmes by the targeted stakeholders can be challenging. Many programmes have a focus on compliance and provide few benefits to users.

Encouraging Adoption of Sustainability Practices

INSIGHT



The NZSD project was a 'Participatory Action Research' type project that worked with a community of practice (case study partners) to progressively assist them enhance their capability to assess sustainability and report outcomes in a transparent and trusted way. This 'real world' context identified a range of practical issues in relation to the adoption by an organisation and its stakeholders of sustainability programmes. They included:

- Leadership and advocacy – the adoption of sustainability programmes is strengthened if it is strongly supported at a senior level of the organisation.
- Benefits to users and the organisations – sustainability programmes that have a clear link with the management of significant risks (such as the management of reputational risks) and/or benefits to users (such as increased resource use efficiency) are more successful.
- Changing organisational priorities – sustainability assessment and reporting is seen by some organisations as 'nice to have', however it may not be a priority and resources allocated to it may be moved to address changing priorities and to address emerging issues. In this case sustainability gains and momentum could be lost. This highlighted the need for a sustained commitment by an organisation with its sustainability journey.
- A journey from weak to strategic assessment and reporting – organisations often follow a path of reactively developing a sustainability programme in response to a crisis or limited set of critical issues. This can often become the basis for the development of a more strategic analysis of sustainability issues and the development of a more strategic response.
- Compulsory vs voluntary - there are significant advantages in an organisation being able to require all its members to participate in a sustainability programme, which is compulsory, especially in relation to the management of reputational risks or the establishment of alignment with marketing attributes. Voluntary programmes are typically not adopted by poorer performing operators; often these are the ones whose management may result in inadequate sustainability performance.

RECOMMENDATIONS



A sustainability programme can never be exhaustive and all-encompassing as the perception of sustainability is constantly evolving, and so are regulatory requirements and stakeholders' views. Therefore, a sustainability programme needs to be regularly evaluated and adjusted and the previous steps of the sustainability journey described in this report repeatedly taken. To keep the sustainability programme fit for its purpose and to tap its full potential it is recommended that you:

1. Adapt to a changing environment in terms of sustainability, whether it is of regulatory nature or due to a change of public opinion. This can potentially affect the prioritisation of indicators. A materiality analysis at regular intervals (yearly or bi-yearly) helps to continue to focus on what matters most to the organisation and to its stakeholders.
2. Assess the (economic) impact of the programme and adjust accordingly to increase tangible benefits for participants and the organisation. An impact analysis, like a cost-benefit-analysis, evaluates whether the implementation of a sustainability strategy has yielded the desired results and helps to adapt the programme to enhance the value to its users. On-going feedback from stakeholders and participants should be integrated into the programme's design.
3. Be aware of the limitations of sustainability assessment. Acknowledgement of the 'incomplete' nature of metrics and indicators allows participants to not lose sight of the 'big picture' and raises awareness of unexpected, unwanted consequences. A sustainability programme is never perfect or finalised. It is an evolving process that must be constantly scrutinized. Clear mechanisms to embrace and facilitate scrutiny for adaptation of the programme can enhance its value and efficacy.
4. Adapt a strategic approach to sustainability assessment as soon as possible. Sustainability initiatives often arise from crisis which induces the industry to react. However, it is more beneficial for an organisation to take the lead and position itself to create and influence the process rather than being chased by external factors. Once a program has been adopted, even under conditions of crises, encouraging it to become internally driven through practitioner feedback and adaptation can be beneficial.
5. Make the sustainability programme compulsory, if possible. If all farmers are required to participate, the effects of the programme are broader, and its credibility is heightened. If a programme is not compulsory, then providing strong industry mechanisms for voluntary adoption by, for example, making certification a requirement for industry marketing activities or awards, can encourage broad uptake.

General Discussion and Conclusions





Sustainability Assessment as a journey

We have found it helpful to frame sustainability as a journey rather than a destination. Focus on the process of journeying builds confidence and avoids risk of becoming overwhelmed and dispirited by uncertainty and a multitude of potential threats ahead.

Using scientifically reliable assessment protocols will indicate more reliably how far an individual farm, vineyard, packhouse or a sector has come along the journey already. The indicators and targets help adjust the speed of the journey i.e. figuring how much more must be invested to reach the goal in time to keep the industry safe or capture a benefit before it disappears.

Reporting progress in a transparent and understandable manner is also crucial. Being seen to be on a journey of continuous improvement is increasingly necessary to underscore a 'social license to farm' from the New Zealand public that mainly lives and votes in towns and has a dwindling understanding of where their food and fibre and financial prosperity is generated.

Show the rewards to the players

A sustainability journey is more likely to be maintained if it delivers immediate and tangible rewards for the main actors i.e. the growers and producers at one end of the supply chain, marketers and strategists in the middle, and consumers at the other end. Sustainability is not just about securing 'good' to be collected later by unknown others - it is also about capturing rewards for producers, right now.

Communicate values as part of the sustainability story

There are also many intangible benefits from good farming practice and the assessment process itself that are harder to quantify, but nevertheless important. Providing a channel and expectation for people to express these social (and human) benefits along the supply chain will be very worthwhile. Telling the background story in human terms convinces and motivates some actors, while others will place more trust in the numbers.

Feeling good about being an efficient and sustainable grower and being able to show others that you are doing well, builds commitment, pride and leadership.

Make a start, no matter how small

Starting a sustainability assessment journey, even with a small step, is the first criterion for eventual success. Getting some early runs on the board helps build that confidence. However, the way the process is initiated potentially has lasting consequences. Voluntary uptake by the growers and processors cements collaboration from the outset and reduces resistance from within the community. A degree of incentivisation to participate, even coercion of reluctant members of the community, may

be necessary if a sustainability programme is born of need to respond to an externally driven and urgent crisis.

Be systematic and prioritise in a transparent way

Assessment and monitoring are potentially expensive, and an *ad hoc* approach is potentially wasteful, even dangerous for the future of the industry. There is a finite number of issues that a community can deal with at once. It is important to distinguish urgency from importance when deciding which issues to focus on at the start: a sustainability journey is a long one, so enough investment of attention and time must be retained for the most important threats and opportunities even if they take a decade or more to materialise.

The materiality and choice modelling methods described in our toolkit, not only help by portioning investments in smart ways, they also offer repeatability and transparency in the prioritisation process.

Prioritisation of monitoring methods

Methods used to select priority topics for assessment and management intervention can also guide smart choice of the monitoring methods themselves and the targets for improvement. A trade-off is likely between the reliability and trust in the metrics, against the cost and importance of the signal for futureproofing agriculture.

Identification of causation: the key to know what to do with the information

Much of sustainability assessment involves monitoring and comparison, either of (i) current performance of different farms, orchards or processing units; or (ii) trends in performance measures of the same operation in successive years, or after some change in farming methods or surrounding conditions. The crucial component for improvement is identifying what can be done to slow or reverse some unwanted change or accelerate a desired shift.

Pinpointing what best to do (or perversely, not do) demands a clear understanding of causation – of what determines the outcome or the way the farming system behaves. Expert research can help identify the most promising interventions, or even predict outcomes if no intervention is made. Interpretation of why the indicators are varying and what if anything to do about it requires the expert knowledge of farmers and sector facilitators. Participation of all the primary affected parties is needed if a lasting and just set of responses is to be agreed. Once an intervention is agreed and put into action, monitoring again comes to the fore to gauge whether it had the desired outcome.

Build engagement before raising the performance bar

Members of any community will inevitably have different levels of readiness and capacity to respond to new demands for change in practice,

or even to assess sustainability itself. We therefore recommend a graduated level of requirements from core and compulsory elements through to discretionary extensions that draw the most active and capable members of a community into accelerated improvements. A process of capture of all members of the community by setting modest bars for initial participation and performance begins the journey. Successive ramping up of requirements can follow and will be more accepted once sustainability assessment is normalised. Leaders who voluntarily adopt more stringent assessment and practices from the outset might first prove the practicality and rewards of going deeper. They can then become more trusted voices and peers from within their own community to encourage continuous improvement across their whole community. Achieving even a modest gain in performance has the potential to build confidence for the next steps.

Turn sustainability audits into learning tools

Sustainability assessment isn't just a test for customers, regulators and voters to gauge whether food and fibre has been produced sustainably and ethically. It is also a learning opportunity for the producers themselves. There are two main ways of motivating producers to learn and improve: (i) benchmarking; and (ii) target setting. Benchmarking performance against peers can motivate a "learning escalator" that leverages off each producer's pride and naturally competitive nature or, more simply, just their will to do better this year compared to last. Setting external targets and measuring the distance-to-target relies on external criteria that set a goal based on some external reference criterion. The critical distinction between the two approaches is that the improvement escalator is based entirely on "internal" information (i.e. the current distribution of current performance), whereas targets are goals determined from outside the observed current performance, usually to avoid some system boundary or meet a practical and absolute criterion set by society.

Benchmarking: a way to identify when and where most improvement is needed

Incentivising improvement through benchmarking has advantages of simplicity and authority of demonstrated practice. Benchmarking is best seen as a rapid and universal way of drawing attention to which members of a community, or blocks of land, are most in need of improvement, or finding the exemplars of good practice and showing them to their peers.

Accelerating improvements with targets

A well-chosen target will tell the community where it now stands compared to where it must reach by a certain time. On the other hand, targets can only incentivise improvement if they are perceived as

realisable and relevant to a producer's own situation. Targets set from outside the farming community may not be practical, trusted or embraced. A low target will embed mediocre performance and complacency; too stiff a target will undermine confidence by encouraging a sense of failure or vulnerability. A practical way of managing these trade-offs is to set a long-term target with considerable stretch, even an aspirational goal to signal broad intent, but erect a set of more realisable milestones to be achieved along the way. Signalling a staircase of increasing levels of required performance in the coming years is less daunting than a focus on the top step alone.

Make your own way to add to New Zealand's sustainability story

The NZSD project has provided many tools to help sustainability assessment: An indicator framework provides a broad terrain map to make sure all threats and opportunities are considered; prioritisation and decision support tools to measure the most important things in the most cost-effective way; benchmarking protocols to measure progress and incentivise learning; communication tools so that all actors are kept moving collaboratively in the same direction.

A haphazard approach will be expensive and wasteful, and it may not futureproof the industry if an important issue is missed. Acute and urgent threats must be managed but building resilience for sustainability is a long game – the materiality tools described here will support to sustain the process.

The international and NZSD research is clear: importing a single or universal recipe for sustainable practice and assessment into a community of producers and processes is unlikely by itself to trigger long-term change for sustainability. We urge instead a slower and more inclusive process from within the community, to build ownership in the initiative so that all actors see it as their own journey, initiated and navigated by them, and moving in a direction that suits their collective needs. Design of the programme must be informed by the producers' own knowledge and skill and be put into action by them. This reflects a fundamental respect of the producers, their needs, their identity, and their contribution to a prosperous New Zealand.

Further Information





**FURTHER
INFORMATION**

The NZSD produced a number of policy briefs and research summaries which provide a concise summary on a range of topics. This library of resources is available through the following link. These resources drill down into issues that are only addressed briefly in this synthesis report.

BROWSE THE RESOURCES

List of Policy Briefs

[Your Sustainability Journey](#)

[Social Sustainability](#)

[Addressing Power Imbalances in Sustainability](#)

[Agricultural Sustainability Open Data Standards](#)

[Choice Modelling](#)

[Distributive justice](#)

[Forestry](#)

[Governance and Sustainability](#)

[Materiality](#)

[Maximising Value from Sustainability Data](#)

[Sustainability and Māori Values](#)

List of Research Summaries

[Indigenous framework](#)

[Individualised benchmarking report](#)

[Predicting land-use change impacts on biodiversity](#)

[Prioritisation of sustainability issues](#)

[Sustainability framework](#)