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Framework and indicators for ‘The New Zealand Sustainability Dashboard’: reflecting New Zealand’s economic, social, environmental and management values

Version 1

(Note: this report will be updated in the future to incorporate findings from the project)

Lesley Hunt¹, Catriona MacLeod², Henrik Moller³, John Reid⁴, Chris Rosin³

1. Lincoln University

2. Landcare Research

3. University of Otago

4. Ngāi Tahu Research Centre

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Reviewed by:

Dr Michaela Balzarova, Lincoln University – Senior Lecturer
Cerasela Stancu, Landcare – Sustainable Business Manager
Professor Paul Dalziel, AERU, Lincoln University – Professor of Economics

Approved for release by:

Jon Manhire, Program Leader, The Agribusiness Group
Isabelle Le Quellec, Project Manager, The Agribusiness Group

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The New Zealand Sustainability Dashboard project Research Partners



Executive Summary

This report supports the development of a sustainability assessment and reporting tool, the *New Zealand Sustainability Dashboard* (NZSD), for the country's production landscapes and associated businesses and organisations. More specifically, it documents the design of the NZSD assessment framework and indicators.

The New Zealand Sustainability Dashboard aims and design

The NZSD is primarily being developed to assist agricultural producers (farmers, orchardists, viticulturists, silviculturists and others), and agricultural businesses and organisations with the rational management of large amounts of available information and with their subsequent management decisions. It will also support them in complying with the ever increasing demands for market and regulatory reporting. It is anticipated that the use of the tool and enhanced information flows resulting from it will help to optimise overall performance including productivity/profitability while protecting environmental and social values. It will reduce monitoring and regulatory costs, build consumer trust, secure market access and garner support from wider New Zealand society by verification and regular reporting of standardised sustainability criteria.

The NZSD provides a framework for sustainability assessment developed to make explicit the sustainability outcomes being targeted, using aligned indicators for assessing performance. The framework design is locally grounded (to guide best practices of special relevance to New Zealand society, ecology and land care) but also internationally relevant (taking into account theoretical concepts, sustainability frameworks, and indicators used internationally) to ensure that overseas consumers can benchmark and verify the sustainability credentials of New Zealand exported products.

Overarching sustainability goals for New Zealand

The NZSD has determined through an iterative process between industry, science, international sustainability frameworks, and consumer expectations, that an enterprise in the primary industries, seeking to assess its current sustainability performance, needs to gauge its functioning in the following pillars of sustainability: good governance, agro-environmental integrity, economic resilience and social well-being. These pillars, outlined in the accompanying figure and table, are associated with definitions describing the goals sought by each pillar, which are synthesised into an overarching sustainability statement appearing at the top of the figure.



A framework for assessing sustainability performance

The proposed framework (see table overleaf) is designed to assess progress towards achieving the overarching sustainability goals. It identifies the core components of New Zealand's sustainability goals for production lands, and associated agricultural enterprises and organisations, targeting 19 outcomes across the four pillars (4–5 outcomes per pillar). To ensure that the framework is relevant to New Zealand's needs, a further tier of 54 outcome focused objectives are specified (10–18 per pillar; see overleaf). Though presented as separate entities the four pillars are very interlinked.

Criteria for reporting on progress towards achieving outcomes are dependent on explicit indicators, for which specific measurements will be developed as appropriate to the different sectors and enterprises within those sectors using the NZSD. Indicators will be measured using quantitative or qualitative parameters that can be assessed in relation to the specified outcome objectives. The proposed framework identifies over 100 indicators across the four pillars, each aligned to a specific outcome objective.

Next steps for refining and implementing the Dashboard

An iterative and interactive process will be used to refine and develop the proposed NZSD, to ensure it is both useful and enduring. The NZSD aims to provide a harmonised framework for stakeholders to more clearly define their sustainability goals, outcomes and objectives for New Zealand's production landscapes and their associated enterprises. Next steps in the development process will include ensuring that the framework: (1) is comprehensive (i.e. embraces diverse values and goals); (2) can be readily tailored to meet specific needs (initially focusing on developing prototype dashboards for kiwifruit, wine, Māori enterprises, forestry and organic farming enterprises); (3) can reconnect multiple 'layers and players' to integrate and harmonise monitoring goals and information.

Indicators are mostly quantitative measures that are selected to assess progress toward or away from shared goals or to assess the state of a resource at any particular time. They are used as a vehicle for communicating information in a summary form about issues important to stakeholders. Thus, the choice of indicators must not only match public and political needs, but also be analytically sound, measurable and easy to interpret. Next steps in the indicator development process will include working with stakeholders to: (1) prioritise indicators for development; (2) co-design tightly prescribed and cost-effective metrics; (3) test the reliability of the indicators once the NZSD prototypes are operating; (4) road-testing the prototypes to identify ways to improve the NZSD performance and usefulness to growers; and (5) facilitate more effective monitoring by continually refining indicator selection and measures.

| PILLAR | OUTCOMES | OBJECTIVES | INDICATORS | | | | |
|------------------------------|---|--|--|--|--|--|--|
| GOOD GOVERNANCE | G1 GOVERNANCE STRUCTURE IS EFFECTIVE | <div><div></div><div></div><div></div></div> | <div><div></div><div></div><div></div></div> | <div><div></div><div></div><div></div></div> | <div><div></div><div></div><div></div></div> | <div><div></div><div></div><div></div></div> | <div><div></div><div></div><div></div></div> |
| | G2 ACCOUNTABILITY IS MAINTAINED | <div><div></div><div></div><div></div></div> | <div><div></div><div></div><div></div></div> | <div><div></div><div></div><div></div></div> | <div><div></div><div></div><div></div></div> | <div><div></div><div></div><div></div></div> | <div><div></div><div></div><div></div></div> |
| | G3 STAKEHOLDER PARTICIPATION IS ENHANCED | <div><div></div><div></div><div></div></div> | <div><div></div><div></div><div></div></div> | <div><div></div><div></div><div></div></div> | <div><div></div><div></div><div></div></div> | <div><div></div><div></div><div></div></div> | <div><div></div><div></div><div></div></div> |
| | G4 THE RULE OF LAW IS FOLLOWED | <div><div></div><div></div><div></div></div> | <div><div></div><div></div><div></div></div> | <div><div></div><div></div><div></div></div> | <div><div></div><div></div><div></div></div> | <div><div></div><div></div><div></div></div> | <div><div></div><div></div><div></div></div> |
| | G5 MANAGEMENT APPROACH IS HOLISTIC | <div><div></div><div></div><div></div></div> | <div><div></div><div></div><div></div></div> | <div><div></div><div></div><div></div></div> | <div><div></div><div></div><div></div></div> | <div><div></div><div></div><div></div></div> | <div><div></div><div></div><div></div></div> |
| ECONOMIC RESILIENCE | C1 FINANCIAL WELL-BEING IS MAINTAINED | <div><div></div><div></div><div></div></div> | <div><div></div><div></div><div></div></div> | <div><div></div><div></div><div></div></div> | <div><div></div><div></div><div></div></div> | <div><div></div><div></div><div></div></div> | <div><div></div><div></div><div></div></div> |
| | C2 VULNERABILITY IS MINIMISED | <div><div></div><div></div><div></div></div> | <div><div></div><div></div><div></div></div> | <div><div></div><div></div><div></div></div> | <div><div></div><div></div><div></div></div> | <div><div></div><div></div><div></div></div> | <div><div></div><div></div><div></div></div> |
| | C3 PRODUCT QUALITY AND INFORMATION IS ENHANCED | <div><div></div><div></div><div></div></div> | <div><div></div><div></div><div></div></div> | <div><div></div><div></div><div></div></div> | <div><div></div><div></div><div></div></div> | <div><div></div><div></div><div></div></div> | <div><div></div><div></div><div></div></div> |
| | C4 CONTRIBUTED TO CREATING VALUE IN LOCAL ECONOMY | <div><div></div><div></div><div></div></div> | <div><div></div><div></div><div></div></div> | <div><div></div><div></div><div></div></div> | <div><div></div><div></div><div></div></div> | <div><div></div><div></div><div></div></div> | <div><div></div><div></div><div></div></div> |
| | C5 PRODUCTION IS EFFICIENT | <div><div></div><div></div><div></div></div> | <div><div></div><div></div><div></div></div> | <div><div></div><div></div><div></div></div> | <div><div></div><div></div><div></div></div> | <div><div></div><div></div><div></div></div> | <div><div></div><div></div><div></div></div> |
| AGRO-ENVIRONMENTAL INTEGRITY | E1 NATURAL CAPITAL MAINTAINED | <div><div></div><div></div><div></div></div> | <div><div></div><div></div><div></div></div> | <div><div></div><div></div><div></div></div> | <div><div></div><div></div><div></div></div> | <div><div></div><div></div><div></div></div> | <div><div></div><div></div><div></div></div> |
| | E2 RESILIENCE SECURED FOR FUTURE USE | <div><div></div><div></div><div></div></div> | <div><div></div><div></div><div></div></div> | <div><div></div><div></div><div></div></div> | <div><div></div><div></div><div></div></div> | <div><div></div><div></div><div></div></div> | <div><div></div><div></div><div></div></div> |
| | E3 CONTRIBUTED TO NATIONAL 'NATURAL HERITAGE' GOALS | <div><div></div><div></div><div></div></div> | <div><div></div><div></div><div></div></div> | <div><div></div><div></div><div></div></div> | <div><div></div><div></div><div></div></div> | <div><div></div><div></div><div></div></div> | <div><div></div><div></div><div></div></div> |
| | E4 GLOBAL ENVIRONMENTAL CHANGE OBLIGATIONS MET | <div><div></div><div></div><div></div></div> | <div><div></div><div></div><div></div></div> | <div><div></div><div></div><div></div></div> | <div><div></div><div></div><div></div></div> | <div><div></div><div></div><div></div></div> | <div><div></div><div></div><div></div></div> |
| SOCIAL WELL-BEING | S1 DECENT LIVELIHOODS ARE SECURED | <div><div></div><div></div><div></div></div> | <div><div></div><div></div><div></div></div> | <div><div></div><div></div><div></div></div> | <div><div></div><div></div><div></div></div> | <div><div></div><div></div><div></div></div> | <div><div></div><div></div><div></div></div> |
| | S2 WORKING CONDITIONS ARE ACCEPTABLE | <div><div></div><div></div><div></div></div> | <div><div></div><div></div><div></div></div> | <div><div></div><div></div><div></div></div> | <div><div></div><div></div><div></div></div> | <div><div></div><div></div><div></div></div> | <div><div></div><div></div><div></div></div> |
| | S3 EQUITY IS SUPPORTED | <div><div></div><div></div><div></div></div> | <div><div></div><div></div><div></div></div> | <div><div></div><div></div><div></div></div> | <div><div></div><div></div><div></div></div> | <div><div></div><div></div><div></div></div> | <div><div></div><div></div><div></div></div> |
| | S4 HUMAN HEALTH AND SAFETY IS PRIORITISED | <div><div></div><div></div><div></div></div> | <div><div></div><div></div><div></div></div> | <div><div></div><div></div><div></div></div> | <div><div></div><div></div><div></div></div> | <div><div></div><div></div><div></div></div> | <div><div></div><div></div><div></div></div> |
| | S5 COMMUNITY RESILIENCE IS ENHANCED | <div><div></div><div></div><div></div></div> | <div><div></div><div></div><div></div></div> | <div><div></div><div></div><div></div></div> | <div><div></div><div></div><div></div></div> | <div><div></div><div></div><div></div></div> | <div><div></div><div></div><div></div></div> |



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Chapter 1: The New Zealand Sustainability Dashboard aims and design

Report aims and structure

This report supports the development of a sustainability assessment and reporting tool, the *New Zealand Sustainability Dashboard* (NZSD), for the country's production landscapes and associated businesses and organisations. More specifically, it documents the design of the NZSD monitoring framework and indicators. Internationally recognised frameworks and their key generic sustainability performance indicators (KPIs) are co-opted into the design to ensure that overseas consumers can benchmark and verify the sustainability credentials of New Zealand's exported products. In a sense this report could also be treated like a toolbox – it provides a generic sustainability framework and indicators which can be picked up by different sectors at different levels (farm/orchard business, associated agribusiness, sector organisation) to design a Sustainability Dashboard appropriate to their interests and present needs while at the same time providing an aspirational goal for growing that Dashboard in the future. Ultimately New Zealand and sector-specific KPIs will be designed to guide farmers, growers, agricultural businesses and organisations to the best practices of special relevance to New Zealand society, ecology and land care.

The report consists of four sections:

- *The New Zealand Sustainability Dashboard aims and design*: Background information on why this tool is needed, what it aims to deliver, as well as the design criteria and processes used to develop the NZSD framework and indicators.
- *Overarching sustainability goals for NZ*: The overarching goal of the NZSD and each of the four pillars of sustainability (good governance, economic resilience, agro-environmental integrity, social well-being) are defined based society's need and values.
- *A framework for assessing sustainability performance*: A four pillar framework is outlined for assessing progress towards achieving the overarching sustainability goals. It identifies the core components of New Zealand's sustainability goals for production lands, along with a further tier of outcome focused objectives and aligned indicators. A rationale and overview is provided for each pillar:
 - Measuring the governance of New Zealand's primary-based industries
 - Measuring the economic resilience of New Zealand's primary-based industries
 - Measuring to secure agro-environmental integrity in New Zealand
 - Measuring the contribution of primary-based industries to social well-being In New Zealand

- *Next steps for refining and implementing the Dashboard.* The NZSD framework and indicators are being built in partnership with several primary industry sectors in New Zealand. It will be incorporated into multifunctional web applications, which are under development to facilitate uploading of regular monitoring results and instantly summarise and report back trends to the growers, to industry representatives, and to agriculture regulators and policy makers at regional and national government levels.

Why develop a sustainability assessment and reporting tool?

The need for the New Zealand Sustainability Dashboard

The primary sector dominates the New Zealand economy. Total primary sector export revenue was \$32,393 million for the year ended 30 June 2013, accounting for 73 per cent of the total merchandise export revenue (MPI, 2013). “New Zealand farmers now operate in a fully deregulated environment and need to be very responsive to demanding consumers and markets” (Martin et al., 2005: 3). Consumers are increasingly aware of issues of food safety and environmental impacts and corporate responsibility reporting is becoming more widespread and expected (KPMG, 2011). In response to this, New Zealand farmers and agribusinesses have to monitor and measure their management practices. New Zealand farmers and agribusiness people also have to rapidly respond to variable weather and, over a longer timeframe, a changing climate, and to do this they need better information to make well informed decisions.

The NZSD design recognises three drivers of sustainability in New Zealand’s production landscapes:

- *Overseas markets:* Key influences on the marketing of New Zealand’s primary products (Saunders et al., 2013), include: the development of agri-environmental policies in the EU and the U.S.; the move towards sustainability in markets driven by the private sector and retailers (e.g., GlobalG.A.P and the Red Tractor Scheme); the change in consumer attitudes and behaviours towards accountability for environmental and social impacts of the products consumers are purchasing and the promotion of sustainable practices; climate change (carbon footprinting); water quality and quantity (water footprinting); protection of biodiversity and wildlife; animal welfare; and the emphasis on local food. This report includes specific indicators which have been operationalised by various product and company schemes internationally to measure economic, social, environmental and governance-based regulation, best practice and market assurance principles. Currently, the database includes 41 assurance schemes.
- *Regulatory requirements:* Many frameworks have been developed by regulatory bodies (The Agribusiness Group, 2013). These are designed to protect the environment and so fit well under the dimension of sustainability which concentrates on “agro-environmental integrity”. In addition, there are many regulations such as those to do with human rights,

employment, animal welfare, company reporting and food quality and safety that cross the economic, social and environmental sustainability dimensions.

- *Business Improvement:* A recent review (Hunt, 2013a) considers the development of the definitions given to sustainability, in particular business sustainability and how this has been measured in the development of different business improvement models and generic frameworks which include some aspect of business. From these different indicators were drawn from a wide variety of organisations covering both New Zealand and overseas, and also the understanding of what measurements were important from the ARGOS programme, the predecessor of the NZSD project.

Delivering a unified assessment and reporting tool for sustainability learning

The NZSD will be more than just an assessment and reporting tool – it will also provide a hub for learning to become more sustainable. It will create an information ‘clearing house’ for linking past data sources to existing decision support software applications so that growers can discover optimal choices for improved farming practice, should the NZSD alert them that their KPIs are approaching amber or red alert thresholds.

The NZSD is primarily being developed to assist farmers/growers with the rational management of the large amounts of available information and with their subsequent management decisions. It will also support them in complying with the ever increasing demands for market and regulatory reporting. It is anticipated that the use of the tool and enhanced information flows resulting from it will help farmers/growers to optimise their overall farm performance including productivity/profitability while protecting environmental and social values. It will reduce monitoring and regulatory costs, build consumer trust, secure market access and garner support from wider New Zealand society by verification and regular reporting of standardised sustainability criteria.

Best-practice criteria for sustainability monitoring designs

Core design principles

The NZSD will comply with five of the Bellagio Principles which were developed in 1996 to articulate core methodological principles in the development of sustainability reporting (Bell and Morse, 2008: 22; SAFA, 2013a).

- Progress towards sustainable development should be based on a measurement of ‘a limited number’ of indicators based on ‘standardized measurement’.
- Methods and data employed for assessment of progress should be open and accessible to all.
- Progress should be effectively communicated to all.
- Broad participation is required.
- Allowance should be made for repeated measurement in order to determine trends and to incorporate the results of experience.

Definitions of agricultural sustainability

The definition of sustainable development that started off the present day global interest in sustainability was that of the Brundtland Commission – development that “seeks to meet the needs and aspirations of the present without compromising the ability to meet those of the future” (WCED, 1987: 43).¹ Agenda 21 followed on from this UN meeting. In this document the focus of sustainability was on the three ‘dimensions’ (Agenda 21²) - social, economic and environmental - and the relationship between them could be interpreted in different ways (for example, see Figures 1.1 and 1.2). A later UN meeting of the World Earth Summit (2002) developed the Johannesburg Declaration on Sustainable Development which stated that there is a “collective responsibility to advance and strengthen the interdependent and mutually reinforcing pillars of sustainable development – economic development, social development and environmental protection – at the local, national, regional and global levels” (UN, 2002: 1). In this statement the expression ‘pillars’ is used rather than dimensions or domains to indicate their ‘interdependence’ and how they mutually reinforce each other and support the ‘arch’ of ‘sustainability’ (Figure 1.3). At the 2012 meeting of the UN Conference on Sustainable Development the institutional framework for sustainable development was one of the two themes and this has become the ‘governance’ pillar, which is sometimes presented as overarching the other three pillars, tying them together (see Figure 7.3). Hence, we have chosen to use this basic top-level framework of ‘pillars’ for the NZSD.

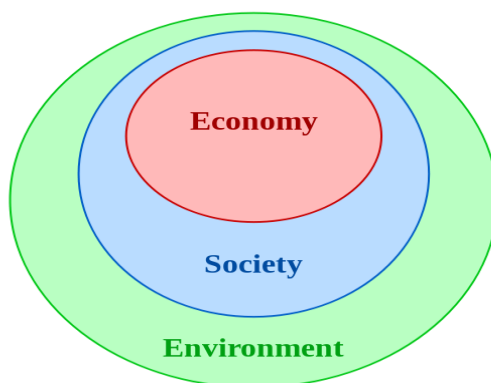


Figure 1.1: Nested sustainability where economy and social dimensions are constrained by environment

Source: Scott Cato (2009: 36-37).

¹ For other definitions used by the Dashboard team see Moller and MacLeod (2013).

² <http://sustainabledevelopment.un.org/content/documents/Agenda21.pdf>

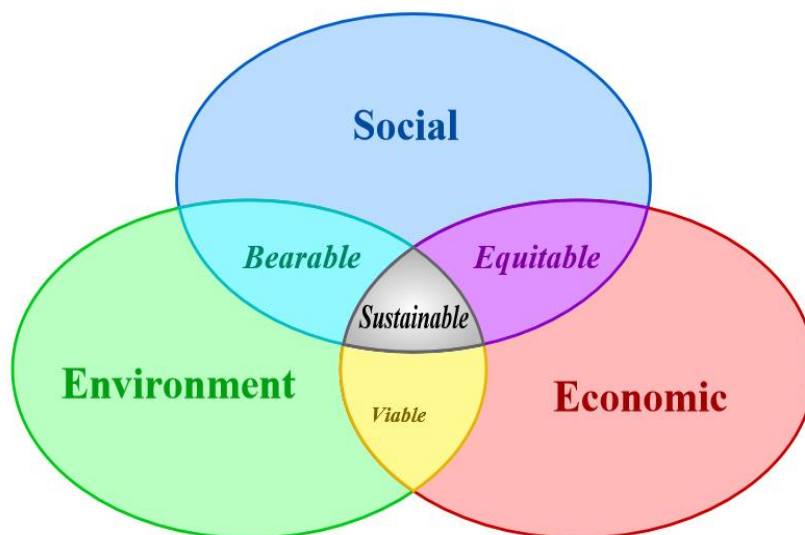


Figure 1.2: Interlinked nature of three pillars of sustainability

Source: Adams (2006).

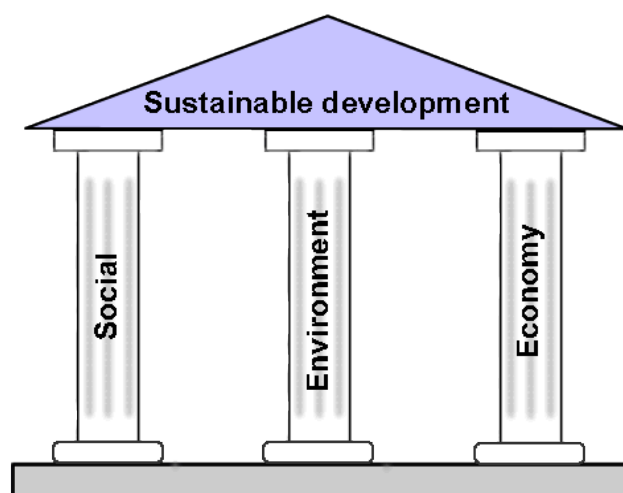


Figure 1.3: The three pillars of sustainable development

The FAO organisation Sustainability Assessment of Food and Agriculture systems (SAFA) has, as would be expected, a more agriculturally oriented definition of sustainable development which is therefore more relevant to the expected usefulness of the NZSD. It appropriately uses a quote from the FAO:

The management and conservation of the natural resource base, and the orientation of technological and institutional change in such a manner as to ensure the attainment and continued satisfaction of human needs for present and future generations. Such sustainable development (in the agriculture, forestry and fisheries sectors) conserves land, water, plant

and animal genetic resources, is environmentally non-degrading, technically appropriate, economically viable and socially acceptable (FAO, 1989).

The measurement of sustainability

The measurement of sustainability has been an ongoing project for over twenty years. The catalyst for this was Agenda 21, a set of action points for sustainable development initiated by the Rio de Janeiro Summit held in 1992. It was hoped that by measuring sustainability individuals, businesses, regions, industries, countries and the world could discover whether in fact they were progressing in the achievement of sustainability and if not it was hoped that they could find out what to do about it and how.

To measure progress towards sustainability we need indicators. An indicator is something that helps you understand where you are and where your community are, what trends are evident, and how far you are from where you want to be. A good indicator alerts you to a problem before it gets too bad and helps you recognise what needs to be done to fix the problem (Farrell and Hart, 1998 as cited in Moller and Macleod, 2013). However, as definitions of sustainability are complex and vary among different stakeholders (see Hunt, 2013a; Bell and Morse, 2008), so too will the indicators chosen to measure it vary by discipline, objective or interest group (Saunders et al., 2006: 15). Therefore, developing metrics that are statistically robust, standardised and repeatable, inexpensive to measure and, most crucial of all, focused on keystone processes of agri-systems, is a formidable methodological challenge.

NZSD framework and indicator design process

Literature reviews

In the first stage of development of KPIs for use in the NZSD, three literature reviews were carried out to identify frameworks and indicators presently in use internationally. This was in order to give the indicators used in the NZSD a recognised legitimacy and a track record.

One report, 'Sustainability Trends in Key Overseas Markets to New Zealand and the KPI identification database' (Saunders et al., 2013), documents the key influences on the marketing of New Zealand's primary products such as: the development of agri-environmental policies in the EU and the U.S.; the move towards sustainability in markets driven by the private sector and retailers (e.g., GlobalG.A.P and the Red Tractor Scheme); the change in consumer attitudes and behaviours towards accountability for environmental and social impacts of the products consumers are purchasing and the promotion of sustainable practices; climate change (carbon footprinting); water quality and quantity (water footprinting); protection of biodiversity and wildlife; animal welfare; and the emphasis on local food. This report includes the KPI Identification Database which contains measures included in key market assurance and good practice schemes. It includes specific indicators by which economic, social, environmental and governance-based regulation, best practice and market assurance principles have been measured by various product and company schemes internationally. Currently, the database includes 41 assurance schemes.

The second report on regulatory frameworks and indicators ‘Sustainability Dashboard: A review of regulatory sustainability frameworks and indicators’ was prepared by The Agribusiness Group (2013). It found that while many frameworks have been developed by regulatory bodies, they have been designed to protect the environment and so fit well under the dimension of sustainability which concentrates on “agro-environmental integrity”.

The third report, ‘Business Improvement Sustainability Frameworks and Indicators: Literature Review’ (Hunt, 2013a), outlines the development of the definitions given to sustainability, in particular business sustainability and how this has been measured in the development of different business improvement models and generic frameworks which include some aspect of business. From there different indicators were drawn from a wide variety of organisations covering both New Zealand and overseas, and also the understanding of what measurements were important from the ARGOS programme, the predecessor of the NZSD project.

The NZSD framework development

The literature reviews established how the development of an underlying framework for the NZSD indicators is a crucial part of the NZSD design. The framework developed by the multidisciplinary NZSD team was driven by efforts to establish a shared framework that provided a comprehensive accounting of sustainability in land-based production enterprises. The overarching aim was to produce a toolbox of trusted indicators which could be used by stakeholders and researchers as a resource to draw on for any version of the NZSD developed for use in a particular sector, and to identify any conceptual gaps in the indicators in order to make a case for their inclusion or omission. At first we used an inductive approach starting with collecting indicators in use from the literature reviews and other sources and prioritising them according to the requirements described later, but it soon became clear that there was a need for an overall structure or framework which would enable more accessible searching and comparison of KPIs relating to particular aspects of sustainability.

As described above, the NZSD is being developed through an iterative process between industry, science, international sustainability frameworks, and consumer expectations. In particular it was apparent from the literature reviews that there are many sustainability frameworks in existence both internationally and nationally. As the United Nations through the FAO has already developed a framework for the assessment of agricultural sustainability (SAFA – Sustainability Assessment of Food and Agriculture) and its formation and continuing development is being informed through international consultation which includes the participation of several members of the NZSD team.³ Like the SAFA (2013b) framework, the NZSD is seen as a work in progress with expected additions and deletions as it is implemented. However, while it is a starting point and very similar in spirit, the NZSD has been adapted to fit the New Zealand agricultural context through a process of selecting outcomes and objectives that can be fitted with indicators that are locally grounded, relevant, useful and affordable.

³ In fact, the NZSD is mentioned as an example on the SAFA front web page – see external links at <http://www.fao.org/nr/sustainability/sustainability-assessments-safa/en/>

Therefore, the NZSD has been developed to have an overarching goal across four pillars of sustainability – Good Governance, Economic Resilience, Agro-environmental Integrity and Social Well-being, and then within each pillar a hierarchy of five levels (Figure 1.4). The first describes the goal for the pillar, which is broken into the outcomes if that goal is achieved. Each outcome is further divided into objectives, or the intent of these outcomes. The achievement or movement towards the objectives will be shown by indicators for which measurements can be developed by each end-user of the Dashboard in consultation with the Dashboard team and other stakeholders.



Figure 1.4: Outline of NZSD framework structure

The development of indicators

Indicators have been chosen according to three key design criteria – stakeholder relevance, local grounding and international relevance, and scientific rigour, as illustrated in Figure 1.5.

Other factors that need to be taken into consideration when choosing indicators are:

- *The stability of the indicators used.* We have tried to be flexible in our choice of indicators because while we are aware that indicators informing policy may need to be changed

whenever there is a change in policy, at the same time, it is better if at their core there is reasonable consistency over time (UN, 2008: 9). As well, this is important because the NZSD aims ultimately to cover different scales of measurement (local, regional, national, global) and different types of businesses and sectors.

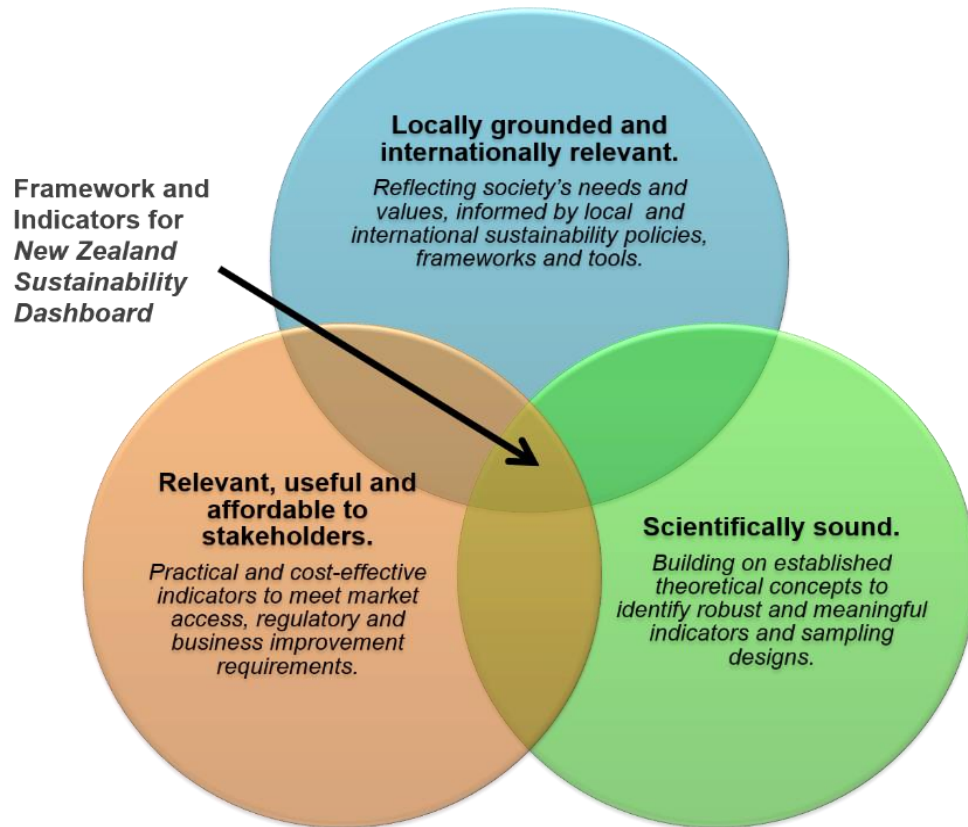


Figure 1.5: Criteria used to select framework and indicators for New Zealand Sustainability Dashboard

- *Qualities of good indicators.* The NZSD team has decided that the quality design criteria for proposed indicators should be as described in greater detail in Table 1.1 and Table 1.2, as compared to Figure 1.5. Table 1.1 focuses on the optimal criteria for individual indicators while Table 1.2 focuses on optimal features for an entire set of indicators (adapted from Moller & MacLeod, 2013).
- *What an indicator measures.* Indicators can be divided into three types: performance, practice and context indicators. The first are often called 'Key Performance Indicators (KPIs)'; the second are referred to as 'best practice'; and the third are components of

‘benchmarking’ or ‘standards’ that help define targets and drive improved performance and practice.⁴

Several context indicators will be gathered to help interpret the monitoring results, but they will be considered in the next phase of operationalising the NZSDs. In the meantime we make some general suggestions of potential examples of performance- and practice-based ‘measures’ for each proposed indicator to illustrate a range of forms for discussion. More specific measures and their sustainability thresholds must be developed later in collaboration with each agricultural sector that hosts its own NZSD if they are to be fully locally grounded, practical and measurable by the viticulturists, farmers, orchardists, foresters, and kaitiaki themselves.

This introductory chapter has introduced the purpose of this report, the development of the NZSD, indicated the best practice to follow in developing such a tool, and the design process followed. The next chapter describes how the goals of the NZSD are aligned locally, nationally and internationally.

⁴ See Moller and MacLeod (2013) for a discussion of their relative strengths and uses. The NZSD will try to use performance-based indicators whenever possible, but practice-based indicators are less expensive, can be scored quickly by farmers and can extend the coverage of the issues monitored by being naturally integrative and grounded in farming practice.

Table 1.1: Qualities of good indicators

| Indicators | Criterion | Description |
|--------------------------------------|--|--|
| (a) Individual indicators | Relevant and meaningful | Indicators should send a clear message and provide information at an appropriate level for policy and management decision making by assessing changes in the status of the environment (including economic and social), (or of pressures, responses, use or capacity), if possible with reference to baselines and agreed targets. Monitoring needs to align tightly with risk management. |
| | Environmentally relevant | Indicators should address key properties of environment or related uses such as states, pressures, responses, use or capability. |
| | Neutral rather than ideologically based | Most indicators should be neutral and objective measures except where serving local values has been declared as the prime target (e.g., cultural health indicators) |
| | By preference, quantified | Indicators should be fully quantified whenever practicable. For some issues qualitative indicators are the only reliable guide and quantification must not be forced. |
| | Clearly defined and repeatable | Indicators must be based on clearly defined, verifiable and scientifically acceptable data collected using standard methods of known accuracy and precision, or based on traditional knowledge that has been appropriately validated. |
| | Broad acceptance | The strength of an indicator depends on its broad acceptance. Involvement of policymakers, major stakeholders, experts and users in the development of an indicator is crucial. |
| | By preference performance based | Where available and practical, it is better to measure actual performance and outcomes rather than practices that are expected to promote sustainability and resilience. Outcomes and outputs are most telling, although indicators that scale output per unit input are useful measures of efficiency. |
| | Affordable monitoring | Accurate, affordable measurement of indicators as part of a sustainable monitoring system, using determinable baselines and targets for the assessment of improvements and regressions, is essential. If scoring is affordable, participation and regularity of monitoring is increased. |
| | Affordable modelling | Information on cause-and-effect relationships should be available and quantifiable, in order to link pressures, status and response indicators. These relational models enable scenario analyses and form the basis of a systems approach. |
| | Sensitive and specific | Indicators should be sensitive in order to show trends, and where possible permit the distinction between human-induced and naturally occurring changes. They should thus be able to detect changes in systems within the time frames and on the scales that are relevant to the decisions, but should also be robust so that measuring errors do not affect their interpretation. It is important to detect changes before it is too late to correct the problems detected. |
| | Link indicators to targets or thresholds | Where possible all indicators should be linked to realisable, action-oriented, measurable and time-delimited targets or critical thresholds of risk, performance or best professional practice. |

Table 1.2: Criteria for sets of indicators

| Indicators | Criterion | Description |
|-------------------------------|--|---|
| (b) Sets of indicators | Representative | The set of indicators provides a representative picture of the pressures, status, responses, uses and capacity being assessed. |
| | Declare values and goals | Explicit declaration of goals and underlying values behind the indicators makes them interpretable in context and builds consensus in management responses. |
| | Low number of indicators | The lower the total number of indicators, the more communicable they are to policymakers and the public, and the lower the cost of communicating them. |
| | Capacity to upscale | Indicators should be designed so as to facilitate aggregation at a range of spatial and temporal scales for different purposes. Aggregation of indicators at the sector, national or international level requires the use of coherent indicator sets and consistent baselines. This also applies for pressure, response, use and capacity indicators. |
| | Mix of simple and aggregated indicators | Some aggregated scores support more holistic appraisals and improve the breadth of coverage. Reductionist and more focused indicators guide fine-grained management adjustments. Always record and archive component scores of aggregated indices so they can be used separately to link to components of management, weighed differently or calibrated against new indicators later. |
| | Wide scope and integration | The framework and indicator sets must cover and cross-link multiple dimensions of sustainability and values encompassing environment, economics, social and governance dimensions. |
| | Trade off generalisability and specificity | Cross-comparison between sectors, regions, countries and diverse socio-ecological systems is facilitated by generalisable indicator structures and protocols cast at higher levels. More locally grounded indicators should be nested under these to guide management by analysing trends but cannot be used for wider benchmarking. A balance between universality and specificity is required. Comparability and generalisability can be incorporated by specifying the general rationale of designing an overarching indicator, even if the details of what is measured or how is not specified or equivalent in all situations. |
| | Data records and management | Database management requires annotation, checking of data, archiving and security management to allow others to replicate current methods. |
| | Linked to standards and certification requirements | Some of the indicators, targets and thresholds should be linked to standards required for market accreditation. |
| | Explanatory and context information monitored | Management guidance is more focused, effective and reliable if additional information is gathered to identify why the indicators change (or don't change despite interventions |
| | Benefits are measured | Incentivise sustainability monitoring and management by quantifying indicators linked to benefits. |
| | Forward focus | Monitoring is part of risk management and of being prepared for future turbulence (shocks and drivers). Some indicators should be chosen to monitor potential new threats and opportunities just over the horizon. |

Chapter 2: Overarching goals of the New Zealand Sustainability Dashboard

The overarching sustainability goals

Through this process so far, it has been determined that an enterprise in the primary industries, seeking to assess its current sustainability performance, needs to evaluate itself according to the following pillars of sustainability: good governance, agro-environmental integrity, economic resilience and social well-being. These pillars outlined in Figure 2.1 and Table 2.1, are associated with a definition describing the goals sought by each pillar. The criteria associated with each pillar are synthesised into a sustainability statement at the top of the table.



Figure 2.1: NZSD overarching goals

Table 2.1: NZSD detailed overarching goals

| Sustainability Pillars | Overarching goals associated with each pillar |
|-------------------------------------|---|
| Good Governance | Good governance facilitates an active participation of all stakeholders. It ensures the legitimacy or the rights of an enterprise to operate and it determines how rigorous sustainability management is incorporated into the operation and culture of an enterprise. Hence good governance will contribute to growth and financial stability by underpinning market confidence, financial market integrity and economic efficiency. |
| Economic resilience | To be economically resilient an enterprise's financial well-being is maintained, its vulnerability minimised, the products it produces are of good quality, accompanied by adequate information, and efficiently produced, and it creates value in the local community. |
| Agro-environmental integrity | Agro-environmental integrity is defined as the state which sustains the full potential of land and its natural capital, ecosystem processes and services to efficiently and indefinitely produce healthy, high quality food and fibre while enhancing natural heritage values and meeting global environmental change obligations. |
| Social well-being | Social well-being is achieved when the respect for rights of equal access to employment and participation in the value-chain and of safe and healthy working environments and the development of supportive communities facilitate the pursuit of the livelihood aspirations of all members of society. |

Demonstrating goals are locally grounded

The NZSD framework has been adapted to meet local needs, particularly those of farm management, and environmental responsibilities. It incidentally highlights components of NZ management practices and policy (e.g., Health and Safety, Animal Welfare, Accident Compensation, Food Quality) taken for granted in NZ.

Alignment of NZSD with Government strategies

Many government strategies are designed for generating outcomes identified as key to sustainability with the NZSD. Table 2.2 briefly highlights and summarises current government strategies and how they align to the sustainability outcomes sought. Future analysis will identify gaps between current government strategy and policy, and where current science, and international thinking, suggests emphasis should be being place in regards to public policy and investment to generate sustainable outcomes.

Table 2.2: Government strategies aligning with the NZSD

| Sustainability Pillars | National NZ Government Strategy Supporting Sustainability Outcomes |
|--|---|
| Good Governance | <p>MoJ – Legal structures, processes, and frameworks for good governance;</p> <p>PCE – Robust independent advice that influences decisions; Accountability; Sound science and reasoned argument;</p> <p>DOC - conservation leadership for a prosperous New Zealand;</p> <p>Stats NZ – Information it needs to grow and prosper; Statistics that are relevant, accessible and trustworthy;</p> <p>TPK - Whakamana – Strengthening leadership and decision-making;</p> <p>VM – Innovation</p> |
| Economic resilience | <p>BGA - Grow, create jobs, improve standard of living, create a more productive and competitive economy; Key “ingredients” for businesses growth: export markets, innovation, infrastructure, and capital;</p> <p>NZTE - International market access;</p> <p>TPK – Māori collective success and collective talent; Rawa – Development and use of resources;</p> <p>MfE – Sustaining and enhancing social and economic development;</p> <p>MPI - Maximising primary exports and improving productivity;</p> <p>MBIE – Productive and internationally competitive business, Innovation, opportunity for business participation;</p> <p>MED – Skilled and successful workforce; Increased financial literacy</p> |
| Agro-environmental integrity | <p>MPI - Increasing sustainable resource use; protecting NZ from biological risk;</p> <p>MfE – Achieving high environmental standards; Sustaining and enhancing social and economic development;</p> <p>BGA - Natural resources;</p> <p>DoC - Conservation for prosperity; Healthy functioning ecosystems.</p> <p>VM - Taiao: distinctive and successful approaches to environmental sustainability</p> |
| Social well-being | VM – Hauora/Oranga: Improving Health and Social Well-being |
| <p>BGA - Business Growth Agenda</p> <p>DoC – Department of Conservation</p> <p>MBIE – Ministry of Business, Employment and Innovation</p> <p>MED – Ministry of Economic Development</p> <p>MfE – Ministry for the Environment</p> <p>MoJ – Ministry of Justice</p> <p>MPI – Ministry of Primary Industries</p> <p>NZTE – New Zealand Trade and Enterprise</p> <p>PCE – Parliamentary Commissioner for the Environment</p> <p>TPK – Te Puna Kōkiri</p> <p>VM – Vision Mātauranga</p> | |

Alignment with Māori cultural values

The recognition of the Te Tiriti o Waitangi within the NZSD brings with it a responsibility to align with Māori cultural values. Table 2.3 indicates the hierarchy from the Māori world view - its emphasis on maintaining and enhancing relationships between the past present and future, all living things and the land, and their connection to practice, through to Government policies that support Māori, to the alignment with components of the NZSD.

Alignment to international sustainability assessment systems

As stated earlier, the development of the NZSD framework and indicators has been informed by an interactional process through the development by FAO of the Sustainability Assessment of Food and Agriculture Systems (SAFA). Table 2.4 shows which themes and sub-themes of the SAFA framework were adopted and/or adapted to fit into the NZSD framework. As described in Chapter 1 the NZSD has also been informed by reviews of the international literature and international and national sustainability assessment tools, by environmental science, economics and social science, and by industry needs within New Zealand. These sources are listed in Table 2.5 to show not only their origin but also their scope, key drivers (policy, market, business) and spatial scale (farm, industry, regional, national, international).

The following chapters describe the different pillars, their outcomes and objectives along with the corresponding indicators given the highest priority for inclusion on the criteria described earlier. While the process was relatively straightforward in most cases, it did require some negotiation over the assignment of some outcomes to pillars and objectives to outcomes. In other words, not all indicators were exclusive to one of the outcomes with, for example, economic indicators having both financial and social implications. In the end, decisions on where to position specific indicators generally reflected the disciplinary understanding and training of members of the research team.⁵

Within each of the outcomes, indicators were organised according to objectives and indicators identified through a further negotiated process. This categorisation largely represents those included in existing frameworks or assessments. The research team has applied their knowledge and experience in the analysis of agricultural sustainability in each of the four pillars to create frameworks that incorporate the range of relevant practices and dynamics from the governance, environmental, economic, social, farm management and Māori perspectives. The resulting suite of recommended indicators is intended to provide sufficient breadth to account for the range of concerns from production to consumption and across diverse scales and scopes subject to the specific concerns and market orientations of producers and processors in New Zealand.

⁵ This situation is not unexpected as the literature on the development of assessment frameworks and indicators commonly notes that the structure of sustainability assessments varies according to the political and power positions of those who create them as well as the target population to be assessed (Colantonio 2009a; Littig and Griessler 2005).

Table 2.3: Alignment of NZSD with Māori values

| Worldview | Relational values – giving effect to worldview & sustainability approach | Practices In Māori enterprises shown to give effect to values (based on research/evidence) | Government policies aimed at supporting development of practices in Māori enterprises | Pillars and main outcomes – NZSD |
|--|--|--|---|---|
| Mauri Whakapapa Definition of sustainability from worldview: | Tino Rangatiratanga - self-determination | Governing – Building and maintaining, competent, strong, and capable governance | TPK - Whakamana – Strengthening leadership and decision-making VM – Innovation | Governance: Corporate Ethics, Accountability, Rule of Law, Holistic Management |
| | | Navigating – Setting clear directions Innovating - Identifying unique and innovative development options | TPK - Rawa – Development and use of resources | Economic: Financial Well-being, Vulnerability |
| | | | TPK - Rawa – Development and use of resources MED – Active discussion around resource development VM – Economic Growth | Economic: Production, Product Quality and Information |
| Enhancing and maintaining the mauri of ngā taonga katoa Or Enhancing and maintaining the life supporting capacity, vibrancy and health of things considered of value. | Manawhenua – expressing rights to manage resources | Managing - Building and maintaining capable management of resources. | | Economic: Local Economy |
| | Whanaungatanga – bonds of kinship & togetherness | Relating - Strategic partnerships, networks, and joint ventures with 'outsiders' with required skills and strengths Building - Enhancing the mauri and therefore mana of whanau, hapu, iwi and community. | VM – Hauora/Oranga: Improving Health and Social Well-being VM - Māori Responsiveness/ Relationship and community building: MED – Government partnership with Māori | Social: Decent Livelihood, Acceptable Working Conditions, Equity, Human Health and Safety, Community Resilience |
| | Manaakitanga – acts of giving | | | Governance: Participation |
| | Whakakotahitanga – respect for individuals and desire for consensus | Leading - Decisive, yet inclusive decision-making, | TPK - Whakamana – Strengthening leadership and decision-making | Social: Community Resilience (commitment to biculturalism) |
| | | Communicating – Good communication and conflict resolution processes | TPK - Whakamana – Strengthening leadership and decision-making | Governance: Governance is Effective, Stakeholder Participation |
| | | | VM - Distinctive Māori Knowledge/ Mātauranga Māori KH – Language Revitalization KH – Indigeneity Distinctiveness TPK – Cultural Distinctiveness | Governance: Governance is Effective Environment: Natural Heritage Social: Community Resilience |

| Worldview | Relational values – giving effect to worldview & sustainability approach | Practices In Māori enterprises shown to give effect to values (based on research/evidence) | Government policies aimed at supporting development of practices in Māori enterprises | Pillars and main outcomes – NZSD |
|--|--|--|--|---|
| | Kaitiakitanga – guardianship of resources and things of value | Sustaining – Good farm/fishing practices that maintain or build the mauri of resources. | VM - Taiao: distinctive and successful approaches to environmental sustainability MPI – Productivity and sustainable resource use. | Environment: Natural Capital (Maintain and Grow), Resilience, Natural Heritage, Global Environmental Change |
| | | Learning - Processes for continual skill development and knowledge acquisition | TPK – Building of knowledge and skills MED – Skilled and successful workforce MED – Increased financial literacy KH – Mātauranga Māori | Social: Community Resilience (human capital and social capital) |
| | Tū Aotūroa – interdependence with the natural environment | | | Social: Community Resilience |
| | Taonga Tuku Iho – holding onto protected treasures passed on. | Protecting - Protecting taonga tuku iho (i.e. sacred sites) | VM - Distinctive Māori Knowledge/ Mātauranga Māori KH – Language Revitalization KH – Indigeneity Distinctiveness TPK – Cultural Distinctiveness | Environment: Natural Heritage Social: Equity, Community Resilience (respecting cultural worldviews incl knowledges, Identity/sense of place) |
| TPK (Strategy of Te Puni Kōkiri – The Māori Potential Approach) VM (Vision Mātauranga – The Māori focused strategy of MBIE, TEC, & Treasury) KH (Ka Hikitia – MoE Māori Strategy) MED (Māori Economic Development Strategy for Ministry of Economic Development) MPI (Ministry of Primary Industries - Māori Primary Sector Partnerships Team Strategy) | | | | |
| Source: Developed by John Reid from Reid (2011) and Reid et al. (2013) | | | | |

Table 2.4: SAFA (2013b) framework (Dimensions, Themes and Sub-themes) showing sub-themes adopted in NZSD pillars

GG = Good governance; ER = Economic Resilience; AEI = Agro-environmental integrity; SWB = social well-being; Parentheses indicate SAFA sub-themes adopted but modified

| SAFA | THEMES | SUB-THEMES | NZSD | SAFA | THEMES | SUB-THEMES | NZSD |
|-------------------------|------------------------|----------------------------------|-------|---------------------|----------------------------------|--|-------|
| GOOD GOVERNANCE | G1 Corporate Ethics | Mission Statement | (GG) | ECONOMIC RESILIENCE | C1 Investment | Internal investment | ER |
| | | Due diligence | GG | | | Community investment | ER |
| | G2 Accountability | Holistic audits | GG | | | Long-ranging investment | ER |
| | | Responsibility | GG | | | Profitability | (ER) |
| | | Transparency | GG | | C2 Vulnerability | Stability of production | ER |
| | G3 Participation | Stakeholder dialogue | GG | | | Stability of supply | ER |
| | | Grievance procedures | GG | | | Stability of Market | ER |
| | | Conflict resolution | GG | | | Liquidity | ER |
| | G4 Rule of law | Legitimacy | (GG) | | | Risk Management | ER |
| | | Remedy, restoration & prevention | GG | | C3 Product quality & Information | Food safety | ER |
| ENVIRONMENTAL INTEGRITY | | Civic Responsibility | GG | | | Food quality | ER |
| | | Resource appropriation | (GG) | | | Product information | ER |
| | G5 Holistic management | Sustainability Management Plan | GG | | C4 Local economy | Value creation | ER |
| | | Full-cost accounting | GG | | | Local procurement | ER |
| | E1 Atmosphere | Greenhouse gases | AEI | SOCIAL WELL-BEING | S1 Decent livelihood | Quality of life | SWB |
| | | Air quality | | | | Capacity Development | (SWB) |
| | E2 Water | Water Withdrawal | AEI | | | Fair Access to Means of Production | SWB |
| | | Water quality | AEI | | Fair Trading Practices | Responsible buyers | (GG) |
| | E3 Land | Soil Quality | AEI | | | Right of Suppliers | (GG) |
| | | Land degradation | (AEI) | | S2 Labour rights | Employment relations | (SWB) |
| | E4 Biodiversity | Ecosystem diversity | (AEI) | | | Forced labour | SWB |
| | | Species diversity | (AEI) | | | Child labour | SWB |
| | | Genetic diversity | AEI | | | Freedom of Association & Right to Bargaining | SWB |
| | E5 Materials & energy | Material use | (AEI) | | S3 Equity | Non-discrimination | SWB |
| | | Energy use | AEI | | | Gender equality | SWB |
| | | Waste reduction & disposal | AEI | | | Support to vulnerable people | SWB |
| | E6 Animal welfare | Animal Health | (GG) | | S4 Human Safety & Health | Workplace Safety & Health Provisions | SWB |
| | | Freedom from stress | (GG) | | | Public Health | SWB |
| | | | | | S5 Cultural diversity | Indigenous knowledge | SWB |
| | | | | | | Food sovereignty | SWB |

Table 2.5: Sustainability initiatives informing the design of the NZSD framework: their origin, scope, drivers (■) and spatial scales (•)

Note: Bold text highlights the schemes to which the NZSD framework design is most closely aligned.

| Code | Initiative | Origin | Scope | Key drivers | | | Spatial scales | | | | | Source |
|----------------|--|---------------|--------------------|-------------|------------------|----------------------|----------------|----------|----------|----------|---------------|---|
| | | | | Policy | Market assurance | Business improvement | Farm | Industry | Regional | National | International | |
| Accountability | AA1000 Stakeholder engagement standard | International | Governance | ■ | ■ | ■ | | | | | • | http://www.accountability.org |
| ACC | Accident Compensation Corporation | NZ | Social, Governance | ■ | | ■ | • | • | | | | www.acc.co.nz |
| ACO | Australian Certified Organic | Australia | Employment | | ■ | ■ | • | • | | | | www.aco.net.au |
| AERU/ARGOS | Agribusiness Indicators | NZ | Sustainability | | ■ | ■ | • | • | | | | Saunders et al., 2007a,b,c,d |
| ARGOS | Agricultural Research Group on Sustainability Indicators | NZ | Sustainability | ■ | ■ | ■ | • | • | | | | Moller et al. 2005 Saunders et al., 2007a,b,c,d |
| ARGOS | Social indicators | NZ | Sustainability | ■ | ■ | ■ | • | • | | | | Rosin et al. 2010 |
| Beef+Lamb | Beef+ Lamb NZ – farmer owned industry organisation | NZ | Economic | ■ | ■ | ■ | • | • | • | • | | www.beeflambnz.com |
| BIOBIO | Biodiversity Indicators for European Farming Systems | International | Environment | ■ | | | • | • | • | • | | Herzog et al. 2012 |
| BMRS | Biodiversity Monitoring & Reporting System | Local | Environment | ■ | | | | | • | • | • | Lee et al. 2005 |
| BWI | WWF Biodiversity & Wine Initiative | International | Environment | | ■ | ■ | • | • | | | | www.wwf.org.za |
| CARE | CARE Household Livelihood Security Assessments | International | Social, Governance | ■ | | | | | • | • | | http://www.careclimatechange.org/files/toolkit/CARE_HLSA_Toolkit.pdf |
| CCBA | Social and Biodiversity Assessment | International | Sustainability | | ■ | | • | • | • | • | | Richards 2012 |
| CG | Conservation Grade | International | Biodiversity | | ■ | | | | | • | • | www.conservationgrade.org |

Chapter 2: Overarching goals of the New Zealand Sustainability Dashboard

| Code | Initiative | Origin | Scope | Key drivers | | | Spatial scales | | | | | Source |
|--------------|--|---------------|------------------------|-------------|------------------|----------------------|----------------|----------|----------|----------|---------------|---|
| | | | | Policy | Market assurance | Business improvement | Farm | Industry | Regional | National | International | |
| COSA | Committee on Sustainability Assessment | International | Sustainability | ■ | ■ | ■ | • | • | • | • | • | www.thecosa.org |
| DairyNZ | Strategic planning for farming businesses | NZ | Sustainability | | ■ | ■ | • | • | • | • | | DairyNZ, 2013b |
| DairyNZ | Dairy NZ – industry good organisation | NZ | Sustainability | ■ | ■ | ■ | • | • | • | • | | www.dairynz.co.nz |
| DeerQA | Deer QA Transport Assurance Programme | NZ | Animal welfare, Social | | ■ | ■ | • | • | | | | www.deernz.org |
| DEFRA | Sustainable Development Indicators | UK | Sustainability | ■ | | | | | • | • | | DEFRA 2012 |
| DoL Labour | - Department of Labour - NZ Labour regulations | NZ | Labour regulation | ■ | ■ | | • | • | | | | http://www.dol.govt.nz/er/services/law/ |
| DoL Holidays | - Department of Labour - NZ Holidays Act | NZ | Labour regulation | ■ | ■ | | • | • | | | | http://www.dol.govt.nz/er/holidaysandleave/ |
| EPI | Environmental Performance Index Framework | International | Environment | ■ | | | | | | • | • | epi.yale.edu |
| ETI | Ethical Trading Initiative Base Code | International | Social - Fair Trade | | ■ | ■ | • | • | | | | www.ethicaltrade.org/eti-base-code |
| FTI | Fair Trade International (FLO) | International | Social - Fair Trade | | ■ | ■ | • | • | | | | http://www.fairtrade.net/ |
| FA | Food Alliance | International | Sustainability | | ■ | | • | • | | | | foodalliance.org/standards |
| FRC | Financial Reporting Council (U.K.) | International | Governance, Economic | ■ | ■ | ■ | | | | | • | https://www.frc.org.uk/ |
| FtoM | Field to Market | USA | Sustainability | | ■ | • | • | • | • | • | | www.fieldtomarket.org |
| GLoBALGAP | GlobalGAP | International | Sustainability | | ■ | ■ | • | • | | | • | www.globalgap.org |
| GRI | Global Reporting Initiative Versions G3,G4 | International | Sustainability | ■ | ■ | ■ | | • | | • | • | www.globalreporting.org |
| Group 100 | Group 100 (Australia) | International | Sustainability | ■ | ■ | ■ | | | | • | • | www.group100.com.au |
| GSCP | Global Social Compliance Programme | International | Sustainability | ■ | ■ | ■ | | • | | • | • | www.gscpnnet.com |

Chapter 2: Overarching goals of the New Zealand Sustainability Dashboard

| Code | Initiative | Origin | Scope | Key drivers | | | Spatial scales | | | | | Source |
|---------------------|--|---------------|----------------|-------------|------------------|----------------------|----------------|----------|----------|----------|---------------|--|
| | | | | Policy | Market assurance | Business improvement | Farm | Industry | Regional | National | International | |
| IFAC | International Federation of Accountants | International | Sustainability | ■ | ■ | ■ | | | | | • | IFAC 2011 |
| IIRC | International Integrated Reporting Council | International | Sustainability | ■ | ■ | ■ | • | • | | • | • | IIRC, 2012 |
| ISO | ISO 14001 | International | Environment | | ■ | ■ | • | • | | | | www.iso.org/iso/iso14000 |
| La Via Campesina | International Peasant Movement | International | Sustainability | | | | • | • | | • | • | http://viacampesina.org/en/ |
| LEAF | Linking Environment and Farming | International | Sustainability | | ■ | ■ | | • | | • | • | www.leafuk.org |
| LEP | Land and Environment Plans | NZ | Sustainability | ■ | | | • | • | • | • | | beeflambnz.com/lep/ |
| LOAM | Landscape Outcomes Assessment Methodology (WWF) | NZ | Sustainability | ■ | | | • | • | • | • | | http://ciifad.cornell.edu/downloads/ME_LOAM_In_PracticeMay07.pdf |
| LUCAS | Land Use and Carbon Assessment System | NZ | Environment | ■ | | | | | | • | • | MfE 2010 |
| MEA | Millennium Ecosystem Assessment | USA | Sustainability | ■ | ■ | | • | • | | • | • | Millennium Ecosystem Assessment (2005) |
| Ministry of Justice | Rule of Law | NZ | Governance | ■ | ■ | ■ | • | • | • | • | • | |
| MOST | Management of Social Transformations | International | Social | ■ | | | | | • | • | • | www.unesco.org |
| MOTIFS | Monitoring Tool for Integrated Farm Sustainability | Europe | Sustainability | | | | | | | | | van Passel and Meul 2012; Meul et al. 2009 |
| MP | Montreal Process Criteria and Indicators | International | Sustainability | ■ | ■ | ■ | | • | | • | • | The Montréal Process 2009 |
| MPI | Ministry for Primary Industries | NZ | Sustainability | ■ | ■ | ■ | • | • | • | • | • | www.mpi.govt.nz |
| NTHC | Ngāi Tahu Holdings Corporation | NZ | Sustainability | ■ | ■ | ■ | | • | • | • | • | Reid et al. 2013 |
| NZSD | New Zealand Sustainability Dashboard | NZ | Sustainability | ■ | ■ | ■ | • | • | • | • | • | Manhire et al. 2012 |

| Code | Initiative | Origin | Scope | Key drivers | | | Spatial scales | | | | | Source |
|---------------|---|---------------|----------------|-------------|------------------|----------------------|----------------|----------|----------|----------|---------------|--|
| | | | | Policy | Market assurance | Business improvement | Farm | Industry | Regional | National | International | |
| OECD | Organisation for Economic Co-operation & Development | International | Sustainability | ■ | | | | | | • | • | OECD 2004, OECD 2001b |
| ONS | Office of National Statistics | UK | Social | ■ | | | | • | • | • | | ONS and DEFRA 2007 |
| RISE | Response-Inducing Sustainability Evaluation | International | Sustainability | | | ■ | • | • | | | | www.hafl.bfh.ch |
| RT | Red Tractor | UK | Sustainability | | ■ | ■ | • | • | | | • | www.redtractor.org.uk |
| SA8000S | Social Accountability 8000 Standard | International | Social | | ■ | ■ | • | • | | | | www.sa-intl.org/sa8000 |
| SAFA | Sustainability Assessment of Food & Agriculture Systems | International | Sustainability | ■ | ■ | ■ | • | • | • | • | • | FAO 2012a,b; SAFA 2013a,b |
| SAI | Sustainable Agriculture Initiative | International | Sustainability | | ■ | ■ | • | • | | | | www.saiplatform.org |
| SAN | Sustainability Agriculture Network | International | Sustainability | ■ | ■ | ■ | | | | | | sanstandards.org |
| SAN RA | SAN RA Chain of Custody – Rain Forest Alliance | International | Sustainability | | ■ | ■ | • | • | | | • | www.rainforest-alliance.org/.../san-ra-chain-of-custody-standard.pdf |
| SAS | Sustainable Agriculture Standard | International | Sustainability | | ■ | ■ | • | • | | | | sanstandards.org |
| SBC | NZ Business Council for Sustainable Development | NZ | Sustainability | ■ | ■ | ■ | | | | | | http://www.sbc.org.nz/ |
| Social Carbon | Social Carbon Methodology | International | Sustainability | | | | • | • | • | | | http://www.socialcarbon.org/ |
| SFB | Sustainable Family Business Model | International | Economic | | | ■ | • | | | | | Olson et al. 2003. |
| SFI | Sustainable Forestry Initiative | USA | Sustainability | | ■ | ■ | • | • | | | • | www.sfiprogram.org |
| SM | SpreadMark System | Local | Fertiliser | | ■ | ■ | • | • | | | | www.fertqual.co.nz |
| SOAAN | Sustainable Organic Agriculture Action Network, Best Practice Guide | International | Sustainability | | ■ | ■ | • | • | | | | www.ifoam.org |

| Code | Initiative | Origin | Scope | Key drivers | | | Spatial scales | | | | | Source |
|-------------------|--|---------------|----------------|-------------|------------------|----------------------|----------------|----------|----------|----------|---------------|---|
| | | | | Policy | Market assurance | Business improvement | Farm | Industry | Regional | National | International | |
| Social Carbon | Social Carbon Methodology | International | Sustainability | | | | • | • | • | | | http://www.socialcarbon.org/ |
| Stats NZ | Statistics NZ | NZ | Sustainability | ■ | ■ | ■ | • | • | • | • | • | www.statisticsnz@govt.nz |
| SWNZ | Sustainable Winegrowing NZ | NZ | Sustainability | | ■ | ■ | • | • | • | | | www.nzwine.com/sustainability/sustainable-winegrowing-new-zealand |
| TBMF | Terrestrial Biodiversity Monitoring Framework | NZ | Environment | ■ | | | | | • | • | | Lee and Allen 2011 |
| ToW | Treaty of Waitangi | NZ | Governance | ■ | ■ | ■ | • | • | • | • | • | Ministry of Justice |
| UNEP | Social—Life Cycle Analysis | International | Sustainability | ■ | | | • | | • | • | • | www.lifecycleinitiative.org |
| UNEP/UN | Principles for Responsible Investment (PRI) | International | Sustainability | ■ | ■ | ■ | | | | | | http://www.unpri.org/ |
| UNESCAP | UN Economic and Social Commission for Asia and the Pacific | International | Governance | ■ | ■ | ■ | | | | | | • Labuschagne et al. 2005 |
| UN-FIP | Climate Investment Funds | International | Sustainability | ■ | ■ | | | | | | | • UN-FIP 2013 |
| UNGC/IFC | UN Global Compact/International Finance Corporation | International | Governance | ■ | ■ | ■ | | | | | | • UNGC/IFC, 2009 |
| UNHRC | UN Human Rights Council | International | Human Rights | ■ | ■ | | | | | | | UNHRC, 2011 |
| UNIL | Unilever | International | Sustainability | | ■ | ■ | • | • | | | | Pretty et al. 2008 |
| Walmart | Ethical performance and socially responsible goals | USA | Sustainability | | ■ | ■ | • | • | | | | Walmart, 2012 |
| WEF | World Economic Forum – New Vision for Agriculture | International | Sustainability | ■ | | | | | • | • | • | WEF 2012 |
| WWF Gold Standard | World Wildlife Fund Gold standard for Optimal Carbon Offsets | International | Sustainability | ■ | ■ | | • | • | | | | http://wwf.panda.org/what_we_do/how_we_work/businesses/climate/offsetting/gold_standard/ |

Chapter 3: Measuring the governance of New Zealand's primary-based industries

Good governance - Ensures sound decision-making and implementation.

Good governance facilitates an active participation of all stakeholders. It ensures the legitimacy or the rights of an enterprise to operate and it determines how rigorous sustainability management is incorporated into the operation and culture of an enterprise. Hence good governance will contribute to growth and financial stability by underpinning market confidence, financial market integrity and economic efficiency.

Governance

'Governance' is one of the overarching dimensions proposed for the NZSD. "Governance means the process of decision-making and the process by which decisions are implemented (or not implemented)" (UNESCAP, 2009: 1). It is commonly used to describe how governments operate and a government's interaction with other institutions in a society, but it is increasingly being used in a business setting where governance "defines the rights of stakeholders, provides the separation of powers between management and a supervisory board, and seeks to insure responsible leadership in all dimensions of an enterprise" (FAO, 2012a: 10). It is believed that it is only through good governance that the challenge of meeting the environmental, economic and social dimensions of sustainability can be achieved (FAO, 2012a: 16). Figure 3.1 displays the attributes of good governance according to UNESCAP.

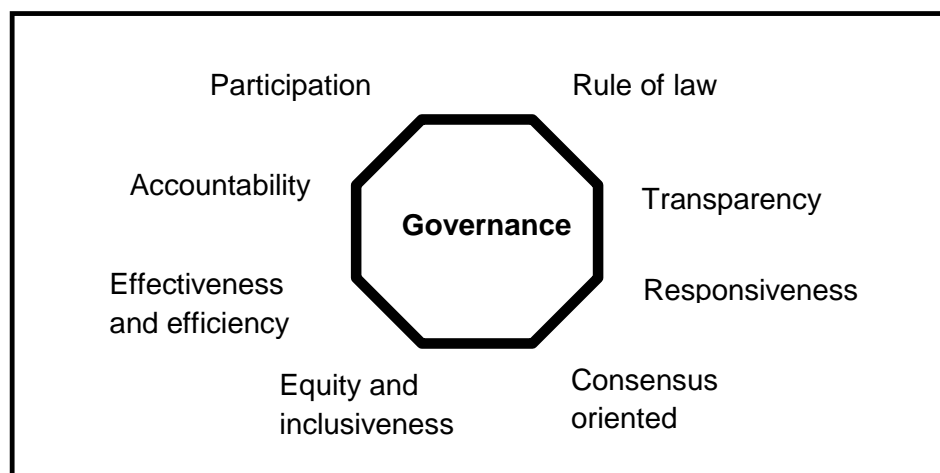


Figure 3.1: Good governance (UNESCAP)

Source: UNESCAP (2009: 3).

Originally sustainability was expressed in terms of the three pillars - environmental, economic and social. In 2001 the UN introduced the fourth dimension of institutional sustainability (Spangenberg, 2002), using the sociological meaning given to the word 'institutions' as the socially accepted rules or norms that can govern 'good' behaviour in any given society (Abercrombie et al., 1988). Institutional sustainability was seen as providing the means of integrating the three pillars. While this wording is still used in some sustainability frameworks it has often been replaced by the word 'governance' which has greater implications for the processes of politics and rule-making not only within a society but within organisations.

According to Keeble et al. (2003: 149):

- *Investors are looking for evidence of good corporate governance, particularly sound business strategy and effective management of risk.*
- *Customers are asking about the origins of products, who made them and what they contain.*
- *Employees are looking to work for companies that visibly account for their responsibilities to society and the environment.*
- *Governments and civil society are increasingly placing pressure on businesses to report on social and environmental performance.*

Good governance links all these aspects and makes sure systems and capabilities are in place to ensure that they happen.

Governance and sustainability

An enterprise committed to sustainable development needs a sustainability-oriented governance structure, in which content, values and responsibilities of the company are clearly stated and through which transparency and accountability are ensured (SAFA, 2013b: 80).

Good governance facilitates an active participation of all stakeholders. It ensures legitimacy or the rights of an enterprise to operate and it determines how rigorous sustainability management is incorporated into the operation and culture of an enterprise. Hence good governance will contribute to growth and financial stability by underpinning market confidence, financial market integrity and economic efficiency (OECD, 2004), and therefore is an important component of sustainability. The inclusion of governance alongside the other key pillars of social, environmental and economic sustainability in the NZSD framework is in line with SAFA and other business approaches, such as the UN Principles for Responsible Investment, the UN Global Compact (UNGCI/IFC, 2009) and the GRI G4 Guidelines (GRI, 2013a, b) (SAFA, 2013a: 56).

For Spangenberg et al. (2002) the dimension of institutional sustainability associated with governance can be divided into two components: institutional framework and institutional capacity. In another vein, the United Nations takes an approach more to do with making sustainability more visible. It suggests companies can address institutional sustainability strategically by:

- *“Mentioning and incorporating sustainability principles within business strategies (i.e., vision, mission, business goals, etc.) in line with those of national and international government.*
- *Openly acknowledging support for global agreements.*
- *Including external sustainable development objectives in internal research and development.*
- *Allocating funds to address sustainability issues beyond the immediate control of the company” (Labuschagne et al., 2005: 376).*

This is also known as a ‘corporate responsibility strategy’ and *“it implies that a prerequisite for all sustainability is a strategy that accepts the company’s responsibility and its vital role in every society it operates in and also in the global environment”* (Labuschagne et al., 2005: 376).

All large-scale businesses today face an enormous challenge to ensure their governance evolves fast enough to meet the challenges of a rapidly changing environment. According to Vallance (2002: 22), *“Governance and leadership quality is one of the greatest challenges facing New Zealand corporations of all shapes and sizes today”*. Table 2.5 presents the information used in formulating the governance framework of the NZSD.

Governance and social well-being

The ‘social’ and governance/institutional pillars have a considerable overlap when the sustainability of a nation state is under the microscope. In this context the social dimension is about the sustainability of a society in terms of the individual operating in a society, whereas governance is to do with the laws and policies associated with the provision of social well-being within that society. However, they have less overlap in the NZSD which is to be associated with enterprises in the primary sector in NZ and therefore governance is concerned with the processes within an enterprise that ensure it meets the expectations of stakeholders and the market and the rules of the nation in which it operates.

In the NZ context, governance is only beginning to be paid attention, for example in the Māori domain (see later) and in the academic world⁶. Three situations in New Zealand which reflect on the importance of good governance follow.

The role of good governance in farm management

There are a variety of governance structures within New Zealand’s primary based industries. In 2005, it was estimated that 97 per cent of farms were family owned and managed businesses (Shadbolt and Bywater, 2005: 27). They may be sole traders, partnerships, companies or trusts and in some cases they have multiple business structures. For example, a family trust owns the land and a partnership provides the management business and stock. These businesses

⁶ In 2012 Victoria University of Wellington established the Institute for Governance and Policy Studies as part of its School of Government.

are usually based on the family unit and involve the owners providing the combined roles of directors, managers and labour. Due to long working hours and personal involvement, decisions may be made without relevant information and time given to the implications of these decisions.

There are a growing number of family businesses that own more than one property or have more than one family as owners. There are also a small number of corporate owned farms, orchards and vineyards. As the size of the business increases, the management is less and less hands-on and more delegation occurs. These businesses require performance indicators for leadership, including the ability to delegate.

Governance of Māori-owned land

Governance of Māori owned land is becoming an important issue in New Zealand. Today Māori own some 1.5 million hectares of land with a value of around \$4 billion. This land is usually in blocks, most of which have a large number of owners, due to ownership passing from the original owners to their many heirs, over successive generations. Therefore, it is necessary to create some form of governance structure to enable the successful management of a land block. Many writers and researchers (see McLean (2002), Thorpe (1976), Steele and Kanawa, (2009), Baynham (2009) and Reid (2011)) have established that having capable and accountable governance to make decisions on behalf of all owners was one of the key practices that determined success in Māori-owned land incorporations. As well studies funded by MAF and MPI have identified that improving the economic performance and governance of Māori owned land that is under-performing relative to industry benchmarks or is under utilised could potentially bring a further 1.2 million hectares into greater production (PricewaterhouseCoopers, 2013). In line with this concern, Reid et al. (2013: 13) have defined governance as the need to have *“a strong, confident and accountable governance team with capable directors/trustees both internal and external to the institution to direct land development”*.

Reid (2011) talks of ‘culturally matched’ governance. Successful management of Māori land is broader than generating utility and financial surpluses. It is likely to be crucial that governors of Māori land achieve the other factors of success for an incorporation to function effectively, as failing to do so would cause political instability which then undermines the incorporation’s ability to generate utility and financial surpluses in the first place. In other words, as theoretical studies suggest, development practices need to be guided by relational values, by ensuring that the land stays in whānau or hapū control (tino rangatiratanga), ensuring balance between production and environmental imperatives (kaitiakitanga), and providing employment and community contributions (manaakitanga).

Harmsworth (2002, 2005) had similar findings. He worked over a number of years with governors operating on behalf of landowner ‘beneficiaries’, to help create development strategies that are matched to cultural expectations. He found a common set of strong relational values emerging through this process which demonstrated a common commitment

to guarding and protecting natural resources for future generations, concern for the well-being of others, self-determination and control over resources, as well as recognition of spiritual beliefs and identity. It is obvious from these research findings that governance is closely linked to the qualities of the leadership provided by the governing body, and this surely extends beyond the Māori cultural context. The practices associated with good governance for Māori land are identified by Reid et al. (2013: 28) in Table 3.1.

Table 3.1: Key practices for achieving sustainable development goals in Māori enterprises and institutions

| Practice | Definition |
|----------------------|---|
| Governing | Building and maintaining culturally-matched, competent, strong, diverse, and capable governance |
| Managing | Building and maintaining capable management that is accountable to governance |
| Navigating | Inclusive and decisive decision-making |
| Relating | Strategic partnerships, networks, and joint ventures between a business, or tribal entity, and 'outsiders' with needed skills and strengths |
| Communicating | Good communication processes between leadership and owners/tribal members |
| Learning | Good processes for continual skill development and knowledge acquisition |
| Innovating | Identifying unique and innovative development options |
| Sustaining | Ensuring actions maintain or build the mauri of non-human kin |
| Protecting | Protecting taonga tuku iho |
| Building | Enhancing the mana of whanau, hapu, iwi and community |
| Revitalizing | Supporting and building a contemporary Māori culture and identity |

Firm structure and governance: Lessons from the kiwifruit sector

Saunders et al. (2007a) found that sheep/beef farmers, kiwifruit orchardists and agribusiness personnel considered firm structure and governance issues to be unimportant as they mainly had family-run businesses. But Saunders et al. (2007a) point out that the kiwifruit sector provides evidence of the importance of industry structure for the success of individual businesses. Before the 1990s, the industry used 'a multiple seller market' but when returns collapsed, as supply finally exceeded demand, buyers were able to play-off one exporter against the other, purely on price. The oversupply was caused by the focus on commodity production orientations, rather than on trade and payment incentives focused on quality. When the industry later united under a single structure, ZESPRI, it enabled supply of both volume and quality to the international market and provided economies of scale (Saunders et al., 2007a: 10).

Governance framework for the NZSD

In the NZSD governance is covered by five outcomes, as shown schematically in Figure 3.2.:

- 'Governance structure is effective',
- 'Accountability is maintained',
- 'Stakeholder participation is enhanced',
- 'The Rule of Law is followed' and the
- 'Management approach is holistic'

Except for 'governance structure' which replaces 'corporate ethics', these outcomes are closely aligned to the themes used in SAFA (2013b), except that they have been re-worded as outcomes. They are applicable at any level of development, for instance, national level, commodity specific or farm. The five governance outcomes are divided into further objectives (Figure 3.2 and Table 3.2). The objectives, tailored to the food and agriculture value chain, are mostly drawn from SAFA sub-themes, however, the NZSD has merged and re-named some to take into account the needs of New Zealand farm management and primary production. Also some SAFA sub-themes have not been seen as applicable in New Zealand because they are already part of legislation or regulation. However, as Moller and MacLeod (2013: 51) state: *"SAFA is particularly innovative in including several dimensions of governance that are usually not included in sustainability assessments in New Zealand because they are embedded in wider society and our way of doing things (e.g., rule of law, equity, transparency, lack of corruption)".* By incorporating these into the NZSD framework the NZSD team has taken the opportunity *"to explicitly demonstrate these advantages that are usually taken for granted in New Zealand"*.

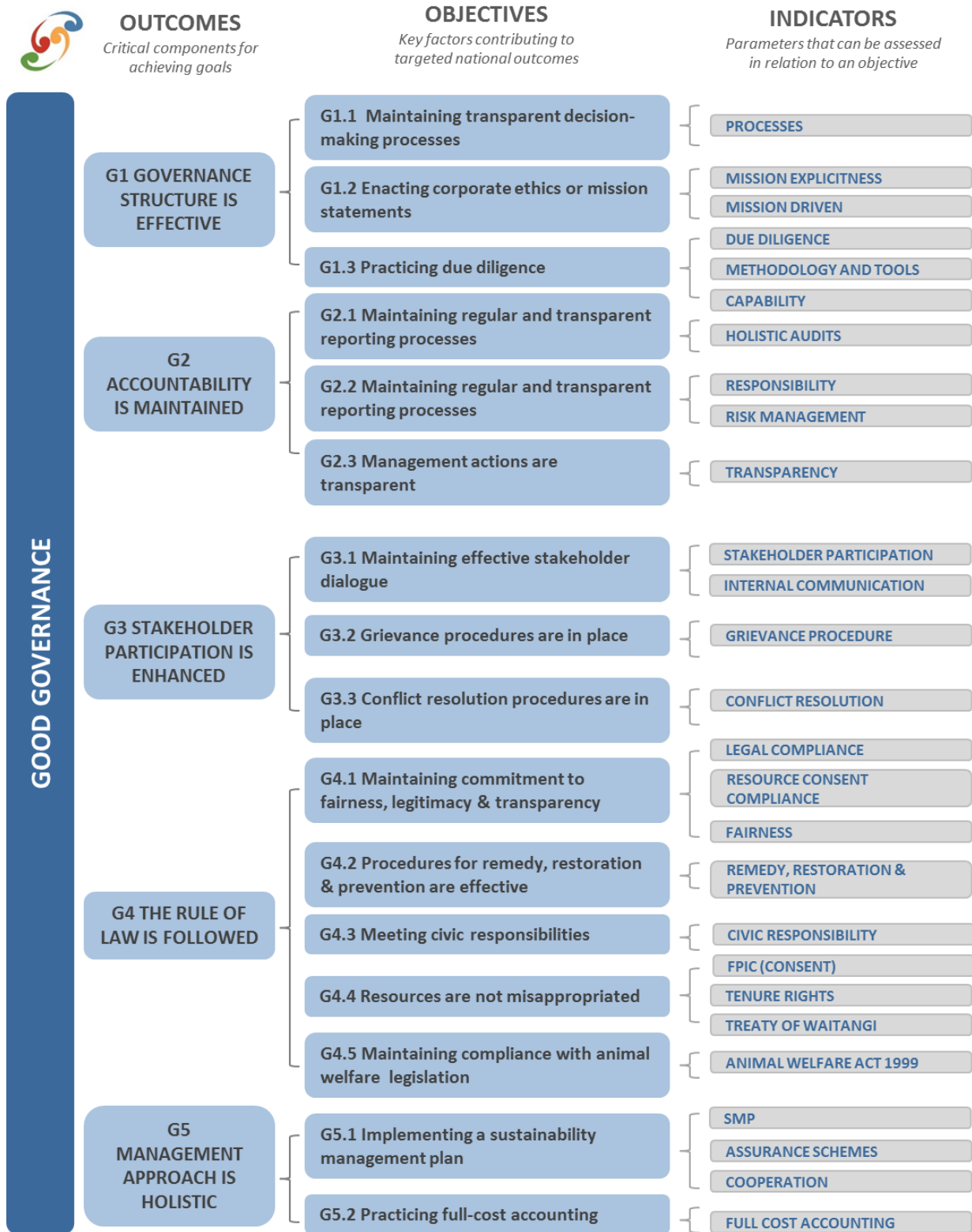


Figure 3.2: Good governance framework in the NZSD

Table 3.2: NZSD governance detailed outcomes and objectives

| | Outcomes | Outcomes description | | Objectives | | Indicators |
|----|---|--|------|---|--------|---|
| | Critical components for achieving goals | | | Key Factors contributing to Outcomes | | Parameters that can be addressed |
| G1 | Governance structure is effective | The enterprise has an explicit and publicly available description of its governance structure - that is, how it makes decisions and how those decisions are implemented. This description includes its sustainability objectives, as well as a Code of Conduct, values or ethical guidelines, which are binding for management and employees, and in line with sustainable development. It has an effective means of implementation and verification of these objectives, as well as of identification and proactive addressing of major sustainability challenges (SAFA, 2013b: 82 plus additions). | G1.1 | Maintaining transparent decision-making processes | G1.1.1 | Decision-making and implementation processes |
| | | | G1.2 | Enacting corporate ethics or mission statements | G1.2.1 | Mission explicitness |
| | | | | | G1.2.2 | Mission driven |
| | | | G1.3 | Practicing due diligence | G1.3.1 | Due diligence |
| | | | | | G1.3.2 | Methodology and tools to monitor and implement sustainability |
| | | | | | G1.3.3 | Capability |
| G2 | Accountability is maintained | The enterprise assumes full responsibility for its business behaviour and regularly, transparently and publicly reports on its sustainability performance (SAFA 2013b: 86). | G2.1 | Maintaining regular and transparent reporting processes | G2.1.1 | Holistic audits |
| | | | G2.2 | Management actions are responsible | G2.2.1 | Responsibility |
| | | | | | G2.2.2 | Risk management |
| | | | G2.3 | Management actions are transparent | G2.3.1 | Transparency |

| | Outcomes | Outcomes description | | Objectives | | Indicators |
|----|---|--|------|---|--------|--|
| | Critical components for achieving goals | | | Key Factors contributing to Outcomes | | Parameters that can be addressed |
| G3 | Stakeholder participation is enhanced | “All stakeholders substantial affected by the enterprise’s activities are identified, empowered and invited to share decision making on activities impacting on their lives and having major environmental impacts” (SAFA, 2013b: 91). | G3.1 | Maintaining effective stakeholder dialogue | G3.1.1 | Effective stakeholder participation |
| | | | | | G3.1.2 | Internal communication |
| | | | G3.2 | Grievance procedures are in place | G3.2.1 | Grievance procedures – employees – contractors |
| | | | G3.3 | Conflict resolution procedures are in place | G3.3.1 | Conflict resolution |
| G4 | The Rule of Law is followed | The enterprise is uncompromisingly committed to fairness, legitimacy and protection of the Rule of Law, including the explicit rejection of extortion, corruption and the use of resources that are under legal dispute, whose use contradicts international agreements or which is considered illegitimate by affected stakeholders. Moreover enterprises will proactively work to improve the protections offered to the environment, vulnerable workers and communities by seeking to strengthen applicable laws and codes in concert with affected stakeholders (SAFA, 2013b: 97). | G4.1 | Maintaining commitment to fairness, legitimacy & transparency | G4.1.1 | Legal compliance |
| | | | | | G4.1.2 | Resource consent compliance |
| | | | | | G4.1.3 | Fairness |
| | | | G4.2 | Procedures for remedy, restoration & prevention are effective | G4.2.1 | Remedy, restoration & prevention |
| | | | G4.3 | Meeting civic responsibilities | G4.3.1 | Civic responsibility |
| | | | G4.4 | Resources are not misappropriated | G4.4.1 | Free & prior informed consent (FPIC) |
| | | | | | G4.4.2 | Tenure rights |
| | | | | | G4.4.3 | Compliance with the spirit of the Treaty of Waitangi |
| | | | G4.5 | Maintaining compliance with animal welfare legislation | G4.5.1 | Compliance with Animal Welfare Act 1999 ⁷ |

⁷ <http://www.legislation.govt.nz/act/public/1999/0142/latest/DLM49664.html>

| | Outcomes | Outcomes description | | Objectives | | Indicators |
|----|---|---|------|---|--------|----------------------------------|
| | Critical components for achieving goals | | | Key Factors contributing to Outcomes | | Parameters that can be addressed |
| G5 | Management approach is Holistic | Production and procurement are managed, and accounting is done, with equal consideration of all dimensions of sustainability and of the trade-offs and synergies linking them (SAFA, 2013b: 105). | G5.1 | Implementing a sustainability management plan | G5.1.1 | Sustainability Management Plan |
| | | | | | G5.1.2 | Assurance schemes |
| | | | | | G5.1.3 | Cooperation |
| | | | G5.2 | Practicing full-cost accounting | G5.2.1 | Full cost accounting |

Outcome G1: Governance structure is effective

Goal

The enterprise has an explicit and publicly available description of its governance structure - that is, how it makes decisions and how those decisions are implemented. This description includes its sustainability objectives, as well as a Code of Conduct, values or ethical guidelines, which are binding for management and employees, and in line with sustainable development. It has an *“effective means of implementation and verification of these objectives, as well as of identification and proactive addressing of major sustainability challenges”* (SAFA, 2013a: 60).

Definition

In formulating this outcome the NZSD has merged the two definitions provided by SAFA for the theme ‘governance structure’ used in the 2012 versions of SAFA (FAO, 2012a, b) and the theme ‘corporate ethics’ used in the SAFA 2013 version 3 (SAFA, 2013b).⁸ An addition has been the first statement which simply asks for some detail on the governance structure. This does not appear to have been included in the SAFA framework though it is obviously an underlying component of this dimension.

As in SAFA, the NZSD would like to see *“the sustainability principle is embedded in the fabric of the enterprise”* (SAFA, 2013a: 59).

In the NZSD the objectives covered include ‘maintain transparent decision-making processes’, ‘enact corporate ethics/mission statements’ and ‘practice due diligence’ - all of which have their roots in SAFA (2013b). Table 3.3 presents these objectives and their associated indicators.

Relevance of governance structure to sustainability

“A good governance structure is the foundation of a successful, sustainability- and integrity-oriented enterprise culture” (Loew and Braun, 2006; Erwin, 2010 as cited in SAFA, 2013a: 59).

As the SAFA guidelines remark: *“Enterprises in the agriculture and food sector have a wide range of governance structures, from a virtual absence of governance to highly sophisticated systems ... Size and market power of enterprises in the same sector, region or value chain are equally variable. This often results in major imbalances and disadvantages, particularly where small enterprises depend on large firms that are better organized, but lack a business purpose going beyond profit. Larger size implies a larger sphere of impact and influence and thus also of responsibility”* (SAFA, 2013a: 59).

⁸ They are:

- *“The enterprise has an explicitly and publicly stated business purpose, as well as a Code of Conduct, both of which are binding for management and employees, and the values and ethical guidelines of which are in line with sustainable development”* (FAO, 2012b: 38).
- *“The enterprise has explicit, publicly available sustainability objectives and effective means of implementation and verification, as well as of identification and proactive addressing of major sustainability challenges”* (SAFA, 2013a: 60).

In essence the indicator of an effective governance structure is that 'the enterprise has a structure in place which satisfies all the objectives of good governance'. In order to refine this three objectives are proposed.

Objective G1.1: Maintaining transparent decision-making processes

The first objective of the 'governance structure is effective' outcome is that the enterprise has an explicit and publicly available description of its governance structure - that is, how it makes decisions and how those decisions are implemented.

The earlier descriptions of what 'good governance' means indicate that it should be important for an enterprise to articulate and have a record of its decision-making processes, in particular which body of the enterprise makes which decisions such that the governance and operational areas are kept separate. This of course, may not be possible in a small enterprise where the owners and the operators may be one and the same.

This objective is an addition to the NZSD that is not contained in SAFA where it seems to be missing in an explicit form.

The indicator of transparency of the decision-making processes or governance structure of the enterprise could be measured by: Has the enterprise an explicit and publicly available description of its governance structure, i.e., its decision making and implementation processes?

Table 3.3: Objectives associated with Outcome G1: Governance structure is effective

| Objectives | | Indicators | | Indicator Description | Key links |
|-------------|--|---------------|--|--|------------------------|
| G1.1 | Maintaining transparent decision-making processes | G1.1.1 | Decision-making and implementation processes | The earlier descriptions of what 'good governance' means indicate that it should be important for an enterprise to articulate and have a record of its decision-making processes, in particular which body makes which decisions such that the governance and operational areas are kept separate. This of course, may not be possible in a small enterprise where the owners and the operators may be one and the same. | SAFA, IIRC |
| G1.2 | Enacting corporate ethics or mission statements | G1.2.1 | Mission explicitness | The commitment to all areas of sustainability is clear to the public, to all personnel and other stakeholders though publishing a mission statement or other similar declaration such as a code of conduct or vision statement) that is binding for management and employees. The mission statement and attendant policies or codes of conduct are living documents which establish a leadership direction and provide guidance and a benchmark against which all employees can deliver. It is also a standard that identifies the values that all stakeholders can expect to see practiced by the enterprise (SAFA, 2013c: 10). | SAFA, GRI, IIRC |
| | | G1.2.2 | Mission driven | The mission is evident in enterprise codes and policies, and the governance body can demonstrate the influence of the mission in informing and developing policy and practice (SAFA, 2013c: 12). | SAFA |
| G1.3 | Practicing due diligence | G1.3.1 | Due diligence | The enterprise is "pro-active in considering its external impacts before making decisions that have long term impacts for any pillar - environmental, economic social or governance - of sustainability" (SAFA, 2013c: 14). | SAFA |
| | | G1.3.2 | Methodology and tools to monitor and implement sustainability | There are appropriate tools and procedures available for assessment, such as risk assessment, that ensure that stakeholders are informed, engaged and respected, and these are being used to inform decisions which will have long term impacts on sustainability. | |
| | | G1.3.3 | Capability | There are capability and resources to carry out sustainability reporting and to maintain record keeping and record storage. | |

Objective G1.2: Enacting corporate ethics/mission statement

This objective asks that *"The enterprise will have made its commitment to all areas of sustainability clear to the public, to all personnel and other stakeholders through publishing a mission statement or other similar declaration such as a code of conduct or vision statement) that is binding for management and employees. The mission statement and attendant policies or codes of conduct should be living documents which establish a leadership direction and provide guidance and a benchmark against which all employees can deliver. It is also a standard that identifies the values that all stakeholders can expect to see practiced by the enterprise"* (SAFA, 2013c: 10).

Within New Zealand there is the acknowledgement that though New Zealand prides itself on having very low levels of corruption across government and business, there is still a need for vigilance. As the Ministry of Justice (2012) stated, *"The Controller and Auditor-General attributed the lack of systemic corruption to "the integrity of our standards and controls, underpinned by strong and shared common values within a small and cohesive society" ... given changes in New Zealand society, we cannot afford to be complacent"* (Ministry of Justice, 2012). Therefore it is generally accepted that *"good governance includes the formulation of a statement that goes beyond profit to embrace ethics and sustainability and based on a vision of a sustainable future that is attractive to all stakeholders"* (Maak and Ulrich, 2007, as cited in SAFA 2013a: 59). An example of this in New Zealand appears in the DairyNZ guidelines that are designed to help farmers develop a strategic plan: *"In addition to a clear idea of where they are heading, successful people and businesses also have a strong set of guidelines or principles which guide and direct them"* (DairyNZ, n.d.a).

A mission statement should state clearly how the enterprise intends to contribute to a sustainable development. As SAFA (2013a: 107) states, *"Through publishing a mission statement or other similar declaration (such as a code of conduct or vision statement) that is binding for management and employees"* an enterprise makes *"its commitment to all areas of sustainability clear to the public, to all personnel, and other stakeholders"*. This can be done through a Code of Conduct which *"provides clear guidance in concrete situations, is authoritative, without limiting scopes of action too much, and fosters desirable behavior. It provides management guidance and priorities for decision making in situations where trade-offs between the dimensions of sustainable development are encountered"* (SAFA, 2012a: 59).

Leadership by an individual or as stressed by an enterprise as a whole, is important in the values and practices of an enterprise and in how it relates to those individuals and enterprises it deals with, as is expressed in this excerpt from the International Federation of Accountants (IFAC): *"Effective leadership complements a values-based program and code of ethics or conduct to promote an organization's (a) underlying values, (b) commitment to employees, (c) standards for doing business, and (d) relationship with wider society. Values are extremely important, and many companies have demonstrated leadership and positive change through developing and implementing these values- based programs and codes of conduct or ethics."*

Setting out and embedding a values-based code of conduct is critical in helping employees deal with the complexity of decisions an organization faces, and can help organizations to effectively manage supply chains to expand globally” (IFAC, 2011: 31). SAFA (2013a: 59) is of the opinion that in “small enterprises typical of agriculture and fisheries, operating culture depends on the personal integrity and values of the entrepreneur, who is personally liable and responsible for the enterprise”.

Businesses producing food have to be aware that ethical standards in production are a growing requirement of food retailers internationally. While ethical standards are required to be enforced by law, many key food retailers in developed markets are making steps to uphold ethical standards beyond compliance. For example, US-based retailer Walmart has outlined its ethical performance and corporate social responsibility goals (see Walmart, 2012).

There is also a concern that an enterprise ‘walks the talk’. *“The enterprise must prove the mission evident in enterprise codes and policies, and the governance body can demonstrate the influence of the mission in informing and developing policy and practice” (SAFA, 2013c: 12). The indicators ‘mission explicitness’ and ‘mission driven’ can be measured by looking at the responses to the following questions:*

“Is the mission of the enterprise articulated in all enterprise reporting and understood by all staff?” (SAFA, 2013a: 60).

“Is the enterprise’s mission evident in codes and policies, and can the governance body demonstrate the impact of its mission on developing policy and practice?” (SAFA, 2013a: 60).

Objective G1.3: Practicing due diligence

The objective ‘practice due diligence’ is articulated as whether the enterprise is *“pro-active in considering its external impacts before making decisions that have long term impacts for any pillar - environmental, economic social or governance - of sustainability” (SAFA, 2013c: 14).*

In this context the process of ‘due diligence’ involves as assessment by an enterprise of the impact of its business on sustainability, or the consequences for sustainability more generally of dealing with other enterprises both in terms of supply and resourcing. It may also involve as assessment or audit of the sustainability of other enterprises it deals with. Therefore, *“due diligence procedures can help anticipate and prevent negative impacts on environment and people, thus protecting the enterprise’s image” (SAFA, 2013a: 59).*

The indicators of whether ‘due diligence’ is being practiced can be assessed by asking the question, *“Does the enterprise have a clear policy for impact assessment, appropriate tools for assessment and is it able to show that these are being used to inform decisions which will have long term impacts on area of sustainability?” (SAFA, 2013a: 60).*

In order for an enterprise to be able to practice due diligence it has to have available appropriate ways of measuring, collecting and analysing data on its own sustainability progression. It also requires the enterprise to have the capability to carry out compliance and

assessment of its own sustainability and to assess the sustainability of enterprises from which it obtains resources and which it supplies.

This objective is not mentioned specifically within the SAFA framework even though it is specified and understood in the SAFA due diligence sub-theme as having 'appropriate tools for assessment'. This is not to do with particular attributes, capabilities of staff, or to do with the capital resources but more to do with the emphasis on the availability of these resources and the training provided by the enterprise for such skills.

If an enterprise is going to report on its sustainability it needs the wherewithal to do it. It needs to have staff who know how and what to measure and when, and how to analyse this data and format it into the required compliance. This involves having trusted, transparent and respected methodologies and tools or protocols. Also, increasingly primary sector businesses have to keep more and more records for compliance for IRD, resource consents, staff Health and Safety and other labour compliance requirements. In addition assurance schemes and traceability of products has also increased record keeping requirements. An example of recording of day-to-day management is grower spray diaries that record all chemical treatments. In this situation, the objective theme would be that these records were kept and that there was the capability to keep them.

Hence the measurement of the indicators 'appropriate methodologies and tools' and 'capability' is obtained by the questions:

- Has the enterprise the capability and resources to carry out its own sustainability reporting?
- Has the enterprise the capability and resources to maintain its own record keeping and record storage?

Outcome G2: Accountability is maintained

Goal

"The enterprise assumes full responsibility for its business behavior and regularly, transparently and publicly reports on its sustainability performance" (SAFA, 2013a: 62).

Definition

In the NZSD (as in SAFA), *"accountability is disclosure of credible information about strategy, goals, standards and performance to those who base their actions and decisions on this information"* (SAFA, 2013a: 61). Objectives include maintaining regular and transparent reporting processes, and management actions are responsible and transparent. Table 3.4 presents these objectives and their associated indicators.

Relevance of accountability to sustainability

Paying attention to accountability entails an enterprise revealing information about its governance, environmental and social performance as well as its financial performance (SAFA, 2013a, b; Group 100, 2003; GRI, 2013a, b; FRC, 2013). Therefore, an enterprise needs to

practice processes that enable it to be accountable to anyone and any other enterprise (local, national, government, NGO etc.) it may impact on by its operation or which may wish to interact with it in some way or other – such as through supplying it or buying products from it. Not only should an enterprise do this but there is a growing pressure to do this as is apparent from the growth of international agencies providing advice and assistance on business reporting, for example, FAO via SAFA, the Global Reporting Initiative (GRI), the International Integrated Reporting Council (IIRC), the Financial Reporting Council (FRC), and the International Federation of Accountants (IFAC). Within New Zealand there is also an increasing emphasis on this in business as demonstrated by the Sustainable Business Council of New Zealand and the New Zealand Business Council for Sustainable Development.

Objective G2.1: Maintaining regular and transparent reporting processes

The objective 'maintain regular and transparent reporting processes' ensures that all areas of sustainability (environmental, economic, social and governance) pertaining to *"the enterprise are monitored internally in an appropriate manner, and wherever possible are reviewed according to recognized sustainability reporting systems"* (SAFA, 2013a: 62).

Simply expressed, this objective is included to ensure that an enterprise carries out appropriate internal audits and preferably uses a sustainability reporting system that has widely recognised credibility. It is hoped that this objective will allow an enterprise to demonstrate how sustainability values are embedded in the enterprise (SAFA, 2013a: 113).

Examples of indicators of acceptable practices for an enterprise to demonstrate its compliance with this objective include:

1. The enterprise has a regular sustainability/holistic audit using a recognized tool and evidence that this is reviewed by governance body and peer reviewed.
2. Or, the enterprise is a small-scale operation that has used a systematic approach of their own or with the assistance of an outside partner to regularly review their sustainability performance.
3. The existence of publicly available information about regularly updated economic, social and environmental performance (e.g., Corporate Social Responsibility (CSR), triple bottom line reporting).
4. The existence and accessibility to independent auditors of complete, correct data and records required for sustainability auditing and reporting (drawn from FAO, 2012a, b; SAFA, 2013a, b and others).

Table 3.4: Objectives associated with Outcome 2: Accountability is maintained

| Objectives | | Indicators | | Indicator Description | Key Links |
|-------------|--|---------------|------------------------|---|-------------------|
| G2.1 | Maintaining regular and transparent reporting processes | G2.1.1 | Holistic audits | "Holistic audits apply when all areas of sustainability ... environment, social, economic and governance that pertain to the enterprise are monitored internally in an appropriate manner, and wherever possible, are reviewed according to recognized reporting systems" (SAFA, 2013c: 16). | SAFA, IIRC |
| G2.2 | Management actions are responsible | G2.2.1 | Responsibility | "The enterprise's governance body takes responsibility for the enterprise's performance in each pillar ... Where the enterprises' performance is found wanting, the governance body takes responsibility for ensuring performance is improved and engages stakeholders in the monitoring of performance improvement plans" (SAFA, 2013c: 18). | SAFA |
| | | G2.2.2 | Risk management | Management of risk is a valued part of the enterprise's decision making processes. | SAFA |
| G2.3 | Management actions are transparent | G2.3.1 | Transparency | "Real transparency involves understanding the information needs of stakeholders and making accurate, timely and relevant information available in an accessible way" (SAFA, 2013c: 20). | SAFA |

Objective G2.2: Management actions are responsible

The objective 'management actions are responsible' aims for *"the enterprise's governance body takes responsibility for the enterprise's performance in each pillar ... Where the enterprises' performance is found wanting, the governance body takes responsibility for ensuring performance is improved and engages stakeholders in the monitoring of performance improvement plans"* (SAFA, 2013c: 18).

In New Zealand there is a growing acknowledgement that farmers should take more responsibility for the impact of their farming practices beyond the farm gate. Four key areas of responsibility are: sustainable management of natural resources; care for farmed animals; care for the people employed on and around the farm; and taking a role in the local community (DairyNZ, 2013b: 25). In addition dairy farmers are expected to contribute to New Zealand's economic welfare and to be part of the nation's business agenda (DairyNZ, 2013b).

Responsibility also extends to risk management – where an enterprise takes responsibility for identifying and managing risks (SAFA, 2013a: 61) and how well risk management is incorporated and valued within the enterprise's decision making. Consumers and investors may be more supporting of enterprises which do this well

Measures of the indicators 'responsibility' and risk management within the management context could be:

- Clear definitions of mandates, responsibilities and accountability regarding sustainable performance applied at all levels of management and clearly incorporated into job descriptions and regular evaluations of employee and department performance.
- Existence of procedures and/or instruments to evaluate the Code of Conduct or mission statement and improve its implementation, including resolving areas of deviation from the mission.
- Demonstrated regular assessment of corporate ethics amongst the most senior level of management at the enterprise.
- Evidence that responsibility is taken for mistakes, and appropriate actions are taken to resolve conflicts in case of a deviation from corporate ethics (taken from FAO, 2012a, b; SAFA, 2013a, b and other sources).

Objective G2.3: Management actions are transparent

The objective 'management actions are transparent' aims to have *"all procedures, policies, decisions or decision-making processes"* publicly accessible where appropriate, *"and made available to stakeholders including personnel and others affected by the enterprise's activities"* (SAFA, 2013a: 62). The later version of SAFA expresses this slightly differently by emphasising the understanding of stakeholders required to achieve transparency: *"Real transparency involves understanding the information needs of stakeholders and making accurate, timely and relevant information available in an accessible way"* (SAFA, 2013c: 20).

The meaning of 'transparency' has three aspects. It implies that there is public access to information which contains:

1. A clear articulation of the roles and separation of roles in the enterprise's decision making processes;
2. Information and processes for the response to requests for information;
3. Compliance assessments or audits – both internal and external (SAFA, 2013; OECD, 2004).

Measurement of the 'transparency' indicator could be: "Does the enterprise have a policy which requires management to report on how policies, procedures, decisions and decision making processes are made accessible to stakeholders?" (SAFA, 2013a: 62).

Outcome G3: Stakeholder participation is enhanced

Goal

"All stakeholders substantial affected by the enterprise's activities are identified, empowered and invited to share decision making on activities impacting on their lives and having major environmental impacts" (SAFA, 2013a: 64).

Definition

"Participation refers to the need for outreach to, and ensuring the potential for involvement of, interested parties, in particular those who are materially affected. This includes the ability to actively take part in decision-making" (SAFA: 2013a: 63).

This outcome includes the objectives 'maintain effective stakeholder dialogue', and 'grievance and conflict resolution procedures are in place'. Table 3.5 presents these objectives and their associated indicators.

Table 3.5: Objectives associated with Outcome G3: Stakeholder participation is enhanced

| Objectives | | Indicators | | Indicator Description | Key Links |
|------------|---|------------|--|--|----------------------------|
| G3.1 | Maintaining effective stakeholder dialogue | G3.1.1 | Effective stakeholder participation | All stakeholders are able to fully participate in organisational decision making. In order for this to happen "the enterprise pro-actively identifies stakeholders, which include all those affected by the activities of the enterprise, including any stakeholders unable to claim their rights" (SAFA, 2013c: 22). "The enterprise is able to effectively engage with stakeholders" ... which "will be evidenced by engagement activities customized for stakeholder type, resulting in comprehensive and mutually satisfactory engagement which is sustained over time" (SAFA, 2013c: 24). "The enterprise has an understanding of how asymmetries of power can prevent the engagement of vulnerable stakeholders. It has a commitment to identifying barriers to engagement for all stakeholder groups and working with those groups to overcome barriers" (SAFA, 2013c: 26). | SAFA, AccountAbility, IIRC |
| | | G3.1.2 | Internal communication | Employees are considered to be stakeholders in the enterprise and as such participate in the enterprise's decision making. | GRI |
| G3.2 | Grievance procedures are in place | G3.2.1 | Grievance procedures – employees – contractors | "Asymmetries of power can be reduced with the provision of clear, accessible and fair grievance procedures. The procedures need not be identical for all stakeholder groups but should follow the principles of natural justice and be designed to be culturally appropriate and where possible mirror processes which are familiar to and respected by the stakeholder group" (SAFA, 2013c: 30). | SAFA |
| G3.3 | Conflict resolution procedures are in place | G3.3.1 | Conflict resolution | "Conflicts of stakeholder interests with the enterprise's activities are resolved through collaborative dialogue ... based on respect, mutual understanding and equity" (SAFA, 2013c: 32). | SAFA |

Objective G3.1: Maintaining effective stakeholder dialogue

This objective seeks to ensure stakeholder dialogue by emphasising the importance of: identifying stakeholders in the first place in order to ensure they receive information and can therefore potentially be contacted, informed and motivated to engage in ways that allow them to participate in dialogue and decision making; identification and overcoming of barriers to engagement; and evidence of effective participation.

Communication and relationship building with stakeholders in the widest sense, is key for good business. Freeman (1984) identifies a stakeholder as *“any group or individual who can affect, or is affected by, the actions of the enterprise”* (as cited in SAFA, 2013a: 63). As SAFA points out it is important to distinguish between stakeholders who are influential in decision making and *those* who are impacted on by an enterprise's decisions. It insists that a broad description be used to identify the latter group which should include *“local communities, consumers, farmers & growers, future generations and the living environment”* (SAFA, 2013: 63). In other words, stakeholders may include: owners, directors, employees, contractors, suppliers, clients, rural lenders, rural professionals, neighbours, and members of the local community.

According to (IFAC, 2011: 34), *“Stakeholder engagement has emerged as a vital tool to develop an understanding of what sustainability means for organizations, and how it can contribute to value creation and the viability of their operations. Failure to identify and engage with stakeholders is likely to lead to poor performance by (a) hurting customer satisfaction and perceptions, (b) adversely affecting employee motivation and morale, (c) damaging relationships in the supply chain, and (d) possibly compromising an organization's reputation with the wider community. The quality of sustainability reporting also depends on constructive stakeholder engagement”*.

AccountAbility, an international organisation providing advice on corporate responsibility and sustainable development, has produced a principles-based, open-source framework to help enterprises engage with stakeholders. Its systematic approach covers: identification of stakeholders and issues; determination and definition of the engagement strategy, objective, and scope; establishment of a plan and implementation; ways of engagement that increase understanding, learning, and improvement; ensuring capability; communication of results; assessment of the process; and incorporation of what was learnt into the next engagement (AccountAbility, 2011).

The first indicator for maintaining effective stakeholder dialogue is 'effective stakeholder participation' which shows how the enterprise endeavours to ensure all stakeholders are able to fully participate in organisation decision making. It should include:

- Stakeholder identification: *"The enterprise pro-actively identifies stakeholders, which include all those affected by the activities of the enterprise, including any stakeholders unable to claim their rights"* SAFA, 2013c: 22).
- Stakeholder engagement: *"The enterprise is able to effectively engage with stakeholders" ... which "will be evidenced by engagement activities customized for*

stakeholder type, resulting in comprehensive and mutually satisfactory engagement which is sustained over time" (SAFA, 2013c: 24).

- Identification and amelioration of barriers to stakeholder engagement: "*The enterprise has an understanding of how asymmetries of power can prevent the engagement of vulnerable stakeholders. It has a commitment to identifying barriers to engagement for all stakeholder groups and working with those groups to overcome barriers*" (SAFA, 2013c: 26).

The second indicator is 'internal communication'. The NZSD considers that employees are stakeholders in the enterprise and as such should participate in the enterprise's decision making.

Some measures of stakeholder dialogue which could be used are those suggested by the FAO (2012a:

- Percentage of identified stakeholders with access to information that is sufficient to empower them to effectively participate in stakeholder dialogue.
- Percentage of identified stakeholders who are actively informed.
- Percentage of decisions on disputed subjects, which are thoroughly justified and explained to affected stakeholders.

The more recent SAFA guidelines (2013a: 118, 120) suggest the following measures:

- Percentage of stakeholders identified versus the number engaged.
- Percentage of stakeholders unable to claim their rights identified.
- Number of stakeholders identified versus the number engaged.
- Number of stakeholders unable to claim their rights identified and engaged.
- Diversity of approaches identified.

Objectives G3.2 and G3.3: Grievance and conflict resolution procedures are in place

Within the outcome of stakeholder participation, the objectives 'grievance procedures' and 'conflict resolution' require that such processes are incorporated into an enterprise's governance to ensure that any stakeholder has "*access to appropriate grievance procedures without risk of negative consequences*" and that these grievances or conflicts can be "*resolved through collaborative dialogue ... based on respect, mutual understanding and equal power*" (SAFA, 2013a: 64). SAFA (2013a: 64) provides descriptors of collaborative dialogue as "*arbitrated, mediated, facilitated, conciliated or negotiated*". In the NZSD these two objectives have been grouped together as it is hoped they are linked in practice.

Three common types of grievances in the primary industries are between buyers and sellers of goods and services, between employers and employees, and conflict within families or business partners. In family businesses there may be conflict between business and family visions and purpose (Saunders et al. 2006: 10). Olson et al. (2003: 645-8) made an extensive

review of literature that could be related to family businesses. They found destructive conflict between family and business goals can affect the sustainability of family businesses.

Mutually recognized grievance procedures and the existence and use of procedures or instruments that ensure the integrity of complainants reduce the negative impacts of grievances. Such procedures are often included in employee contracts and contracts between suppliers and purchaser, and are enforceable by law. In the NZSD they are covered under the Rule of Law theme, and the Economic and Social dimensions.

Indicators associated with these objectives are therefore to do with the existence and the effectiveness of grievance procedures and conflict resolution processes. Hence measures may be:

- Percentage of disputed subjects that are addressed in a dialogue-based solution-finding process led by an independent, commonly agreed party.
- Existence and utilisation of procedures or instruments (e.g., mediators) ensuring that conflict solution is dialogue-based (not power-based).
- Existence and utilisation of contracts that have a set dispute resolution process (FAO, 2012a: 47).

Outcome G4: The Rule of Law is followed

Goal

"The enterprise is uncompromisingly committed to fairness, legitimacy and protection of the Rule of Law, including the explicit rejection of extortion, corruption and the use of resources that are under legal dispute, whose use contradicts international agreements or which is considered illegitimate by affected stakeholders. Moreover enterprises will proactively work to improve the protections offered to the environment, vulnerable workers and communities by seeking to strengthen applicable laws and codes in concert with affected stakeholders" (SAFA, 2013a: 66).

Definition

"The United Nations defines the Rule of Law as a principle of governance by which all persons and entities are "accountable to laws that are publicly promulgated, equally enforced and independently adjudicated". In the simplest terms, it is compliance with legislation. In SAFA the Rule of Law is considered in a business context, its main central aim being the protection of the individual and group rights of all (Ehm, 2010: 5)" (as cited in SAFA, 2013a: 65).

As for the SAFA (2013a, b) sub-themes, the objectives for the NZSD within this outcome are to do with maintaining fairness, legitimacy and transparency, practicing procedures for remedy, restoration and prevention, meeting civic responsibilities, and making sure resource are not appropriated, with the addition of animal welfare compliance which has been moved out of the environmental outcome into governance. The NZSD team felt animal welfare compliance fitted better in the Rule of Law outcome due to New Zealand having legislation and a number of code

of practices to protect animal welfare, unlike some countries. Table 3.6 presents these objectives and their associated indicators.

Description

The Ministry of Justice states that the Rule of Law is an important part of New Zealand's constitution but that the concept is not easily defined and is better described as encompassing certain ideas to do with freedom and the control of the exercise of power of individuals, institutions or organisations, such as:

- *"There are minimum standards of justice to which the law must conform, e.g., laws affecting human liberty should be reasonably certain and clear;"*
- *"The law should have safeguards against the abuse of wide discretionary powers;"*
- *"A person should not be deprived of his or her liberty, status or other substantial interest without the opportunity of a fair hearing before and impartial court or tribunal" (Ministry of Justice, n.d.: 5).*

Relevance of Rule of Law to sustainability

In seeking to have a compliance system that has international recognition and integrity it is important that the NZSD also follows the Rule of Law (ROL) as it is crucial in international agreements. It implies the existence of some universal understanding common to all countries of the most important components of a legal system to do with human rights. Key elements are *"accountability before the law, legal certainty and legal transparency"* SAFA (2013a: 65). *What is more, according to SAFA (2013a: 65), "an enterprise committed to the ROL will only conduct business with other businesses that follow the rule of law".*

There are aspects of the 'Rule of Law' specific to agriculture over such issues as access and certainty of access to resources, processes over disputes and the legality of stakeholders claims (SAFA, 2013a: 65).

In New Zealand there are a number of acts and regulations to ensure fairness in business and to protect human and animal rights and resources. Key legislation includes: the Fair Trading Act 1986⁹, The Treaty of Waitangi; Resource Management Act 1991 (RMA)¹⁰; Employment Relations Act 2000¹¹ and other laws that affect the employment relationship, and Animal Welfare Act 1999¹².

⁹ <http://www.legislation.govt.nz/act/public/1986/0121/latest/DLM96439.html>

¹⁰ <http://www.legislation.govt.nz/act/public/1991/0069/latest/DLM230265.html>

¹¹ <http://www.legislation.govt.nz/act/public/2000/0024/latest/DLM58317.html>

¹² <http://www.legislation.govt.nz/act/public/1999/0142/latest/DLM49664.html>

Table 3.6: Objectives associated with Outcome G4: The Rule of Law is followed

| Objectives | | Indicators | | Indicators Description | Key Links |
|------------|---|------------|----------------------------------|--|----------------|
| G4.1 | Maintaining commitment to fairness, legitimacy & transparency | G4.1.1 | Legal compliance | "Operational legitimacy will firstly be judged by the enterprise's adherence to the rule of law" (SAFA, 2013c: 34). This is the minimum standard but it should include going "beyond the rule of law by adopting and complying with applicable international voluntary codes consistent with its mission" (SAFA, 2013c: 34). | SAFA |
| | | G4.1.2 | Resource consent compliance | The enterprise complies with all its resource consents. This is particularly applicable to NZ where agricultural enterprises are affected by the Resource Management Act 1991. ¹³ | NZ Legislation |
| | | G4.1.3 | Fairness | New Zealand has a commitment to fair trading as part of its legislation, the Fair Trading Act 1986. ¹⁴ | NZ Legislation |
| G4.2 | Procedures for remedy, restoration & prevention are effective | G4.2.1 | Remedy, restoration & prevention | "Operational legitimacy will first be judged by the enterprise's adherence to the rule of law and its ability to promptly remedy any breach, restore or compensate the effects of any breach, and put in place mechanisms to prevent any future breach. The same regime applies to less sanctioned rules, such as local or national regulations and voluntary codes to which the enterprise may subscribe or support and should be applied to international human rights standards" (SAFA, 2013c: 36). | SAFA |
| G4.3 | Meeting civic responsibilities | G4.3.1 | Civic responsibility | Enterprise's need to show that they proactively use their power "responsibly and on behalf of the least powerful stakeholders and those who cannot claim their rights" (SAFA, 2013c: 38). | SAFA |

¹³ <http://www.legislation.govt.nz/act/public/1991/0069/latest/DLM230265.html>

¹⁴ <http://www.legislation.govt.nz/act/public/1986/0121/latest/DLM96439.html>

| Objectives | | Indicators | | Indicators Description | Key Links |
|------------|--|------------|--|--|----------------------------|
| G4.4 | Resources are not misappropriated | G4.4.1 | Free & prior informed consent (FPIC) | "An enterprise will have its reputation compromised and may suffer in the market if it reduces the existing rights of communities to land, water and resources, particularly if the livelihoods of the communities have been reduced. The principles of Free, Prior and Informed Consent (FPIC) have been developed through extensive consultation to protect communities from unscrupulous resource exploitation and misappropriation" (SAFA, 2013c: 40). | SAFA |
| | | G4.4.2 | Tenure rights | "The responsible governance of tenure ensures access to land, fisheries and forests are equitably shared. It protects economically and socially marginalized people from alienation from the resources they need to live" (SAFA, 2013c: 42). | SAFA |
| | | G4.4.3 | Compliance with the spirit of the Treaty of Waitangi | The partnership between Māori and the New Zealand government is recognised by the 'Treaty of Waitangi', New Zealand's founding document, which establishes the relationship between the Crown and Māori as tāngata whenua. Other recent New Zealand legislation requires that consideration be given to the principles of the Treaty, for example, the RMA (Section 8). | NZ Legislation and culture |
| G4.5 | Maintaining compliance with animal welfare legislation | G4.5.1 | Compliance with Animal Welfare Act 1999 | New Zealand has animal welfare legislation that enforces the protection of animal health and welfare through regulation of animal health practices, humane animal handling practices, appropriate animal husbandry and freedom of animals from stress. This covers the SAFA requirements. | SAFA |

Objective G4.1: Maintaining commitment to fairness, legitimacy and transparency

This objective aims for an enterprise to demonstrate fairness and legitimacy thereby gaining the recognition that it has the moral authority to exist and transact business and other relationships with other enterprises. This means that it is *"compliant with all applicable laws, regulations and standards voluntarily entered into by the enterprise ... and international human rights standards"* (SAFA, 2013a: 66). For the NZSD this has been extended to specify, as part of that legitimisation, a commitment to fairness.

Employment law in New Zealand is covered by a number of different acts to ensure workers' rights. Key acts are: Employment Relations Act 2000; the Holidays Act 2000; the Minimum Wage Act 1983¹⁵; Equal Pay Act 1972¹⁶ and the Health and Safety in Employment Act 1992¹⁷. There are financial penalties for not complying (MBIE, 2013). Details associated with these laws can be found on the MBIE website (www.mbie.govt.nz).

Compliance with the Fair Trading Act 1986 ensures fairness in trading, underpinning New Zealand business transactions, making it illegal for traders to mislead consumers, give them false information, or use unfair trading practices. Therefore, such compliance backs up the growing demands of consumers, particularly amongst premium segments of the market, for the things that they buy to come from countries and companies that adhere to sustainable practices socially as well as environmentally (Saunders et al., 2007a).

The principle of fairness, is not just to do with the present but also the future. There is a need to balance the needs of both current and future generations, as is included in the Brundtland definition (WCED, 1987: 43) of sustainable development as development that *"seeks to meet the needs ... of the present without compromising the ability"* of future generations to meet their own needs. Future generations should have the same options as the present generation, and should not be limited by the consequences of actions of the present generation.

The indicators, 'legal compliance', 'resource consent compliance' and 'fairness' are measured by whether or not an enterprise adheres to laws that give it the rights to operate, whether these are well incorporated into the mission and culture of the enterprise, and that it at least aspires to meet fair trade requirements in its sourcing of resources and in the sale of its products (SAFA, 2013a: 130). Legal compliance is described by SAFA (2013c: 34) as *"Operational legitimacy will firstly be judged by the enterprise's adherence to the rule of law"*. This is the minimum standard but it should include going *"beyond the rule of law by adopting and complying with applicable international voluntary codes consistent with its mission"* (SAFA, 2013c: 34). Compliance with resource consents is particularly applicable to NZ where agricultural enterprises are affected by the Resource Management Act 1991. In New Zealand 'fairness' is covered by compliance with the Fair Trading Act 1996.

¹⁵ <http://www.legislation.govt.nz/act/public/1983/0115/latest/DLM74093.html>

¹⁶ <http://www.legislation.govt.nz/act/public/1972/0118/latest/DLM407770.html>

¹⁷ <http://www.legislation.govt.nz/act/public/1992/0096/latest/DLM278829.html>

Objective G4.2: Procedures for remedy, restoration and prevention are effective

This objective aims for an enterprise to have effective mechanisms to remedy and restore situations in which there have been infringements of laws, regulations or standards and also procedures to prevent any recurrence of such infringements. This goes beyond the SAFA requirements which specify that this just happens when there is an infringement, but like SAFA, it requires that there is a useful response to such infringements as implied by using the word 'effective'.

The United Nations Human Rights Council (UNHRC, 2011) has produced a document 'Guiding Principles on Business and Human Rights' with the aim of promoting and protecting all human rights - civil, political, economic, social and cultural, including the right to development. This framework describes what companies are required to do and how companies can know and show that they respect human rights in practice (Shift and Mazars, 2013). However, the Human Rights Resource Centre (2013) of the University of Indonesia claims that *"there is yet no global and widely accepted process for companies to demonstrate whether their policies and processes are indeed aligned with the UN Guiding Principles"*.

The indicator 'remedy, restoration and prevention' can be described as: *"Operational legitimacy will first be judged by the enterprise's adherence to the rule of law and its ability to promptly remedy any breach, restore or compensate the effects of any breach, and put in place mechanisms to prevent any future breach. The same regime applies to less sanctioned rules, such as local or national regulations and voluntary codes to which the enterprise may subscribe or support and should be applied to international human rights standards"* (SAFA, 2013c: 36). It could be measured by the reporting of infringements, the consequent process and its results (SAFA, 2013a: 132).

Objective G4.3: Meeting civic responsibilities

The objective 'civic responsibility' seeks to ensure that the enterprise does not try to escape strict laws on social and environmental aspects within its sphere of influence (e.g., by relocating facilities), but *"supports the improvement of the ... regulatory framework on all dimensions of sustainability"* (SAFA, 2013a: 65).

As SAFA (2013a) points out, enterprises to do with food can be very powerful at both a national and a global level, and to meet this objective, enterprise's need to show that they proactively use their power *"responsibly and on behalf of the least powerful stakeholders and those who cannot claim their rights"* (SAFA, 2013c: 38). *"A sustainable food supply chain will be achieved when all parts of the supply chain are free from exploitation of individuals, communities and the environment across all four dimensions of sustainability"* (SAFA, 2013a: 134).

Where an enterprise operates in different locations (particularly different countries) it is important that it has a common statement, such as a Code of Conduct, which is not location dependent and therefore applies to the enterprises wherever they operate. An aim of an enterprise could also be to engage in activities and initiatives which improve the regulatory

framework on sustainability at the local, national and/or international level (SAFA, 2013a: 65, 134).

The following measures of the indicator 'civic responsibility' will primarily apply to larger enterprises and those with a strong commitment to sustainability principles.

From "board agendas, minutes or other governance records ... establish:

- *A register of all peak bodies or lobbying groups to which the organization belongs.*
- *Records of any lobbying direct or indirect in which the organization seeks to influence laws, regulations, international human rights codes or other voluntary codes.*
- *Testing these activities against mission and against the interests of the least powerful and those who cannot claim their rights.*
- *Where evidence of lobbying is found, the impact of this is tested by seeking the views of affected stakeholders" (SAFA, 2013a: 134).*

Objective G4.4: Resources are not misappropriated

The objective 'resources are not misappropriated' seeks to ensure that *"enterprises do not reduce the existing rights of communities to land, water and resources and operations are carried out after informing affected communities by providing information, independent advice and building capacity to self-organize for the purposes of representation"* (SAFA, 2013a: 66).

The first indicator of this objective ensures that decisions are made with 'free and prior informed consent'. This is described by SAFA (2013c: 40) as *"An enterprise will have its reputation compromised and may suffer in the market if it reduces the existing rights of communities to land, water and resources, particularly if the livelihoods of the communities have been reduced. The principles of Free, Prior and Informed Consent (FPIC) have been developed through extensive consultation to protect communities from unscrupulous resource exploitation and misappropriation"*.

The second indicator is to do with tenure rights. *"The responsible governance of tenure ensures access to land, fisheries and forests are equitably shared. It protects economically and socially marginalized people from alienation from the resources they need to live"* (SAFA, 2013c: 42). The two key documents that guide resource appropriation in New Zealand are the Resource Management Act 1991 (RMA) and The Treaty of Waitangi. The RMA set out to create a more streamlined, integrated and comprehensive approach to the management of parts of the environment which are considered to be of national importance. In the RMA, sustainable management means:

Managing the use, development, and protection of natural and physical resources in a way, or at a rate, which enables people and communities to provide for their social, economic, and cultural well-being and for their health and safety while:

- a. *sustaining the potential of natural and physical resources (excluding minerals) to meet the reasonably foreseeable needs of future generations; and*
- b. *safeguarding the life-supporting capacity of air, water, soil, and ecosystems; and*
- c. *avoiding, remedying, or mitigating any adverse effects of activities on the environment (RMA, 2013).*

In the RMA natural and physical resources include land, water, air, soil, minerals, energy, all forms of plants and animals, and all structures. The environment includes people and communities as well as what is usually thought of as 'natural' ecosystems.

The third indicator is to do with compliance with the spirit of the Treaty of Waitangi. The partnership between Māori and the New Zealand government is recognised by the 'Treaty of Waitangi', New Zealand's founding document, which establishes the relationship between the Crown and Māori as *tāngata whenua*. Other recent New Zealand legislation requires that consideration be given to the principles of the Treaty, for example, the RMA (Section 8). The principles of the Treaty of Waitangi are an interpretation of the Treaty's text which continues to evolve. In the broadest sense the principles of the Treaty, to date, have been interpreted as:

- the principle of active protection
- the tribal right to self-regulation
- the right of redress for past breaches
- the duty to consult (Waitangi Tribunal, n.d.).

Objective G4.5: Maintaining compliance with animal welfare legislation

The 'animal welfare' objective aims to protect the physical and psychological well-being of animals (SAFA, 2013a, b). Animal welfare legislation and regulations require animals to be kept in ways that mean they live lives that are free from stress and that they live in species-appropriate conditions.

Internationally, the food service and retail sectors have played a major role in animal welfare, creating standards that their suppliers are required to meet. This has also been caused by public shift in perceptions towards animals with demands for standards and safeguards for the care and use of animals in research, trade and production.

Animal welfare cuts across economic, good governance and social themes. Poor animal welfare reduces farm productivity and profitability and is socially unacceptable. As New Zealand has explicit animal welfare standards contained in both regulations and laws it has been placed as an objective in the 'Rule of Law is followed' outcome under good governance rather than as an outcome in the Environmental integrity pillar as it is in the SAFA (2013b) assessment system.

New Zealand's pastoral farming is dependent on animals and this is well recognised in legislation. Animal health has a significant impact on farm productivity and profit, affecting animal growth rates, death rates, reproductive rates and farm costs. The primary legislation is the Animal Welfare Act 1999 which sets out obligations for people who own or are in charge of animals, and requires them to meet the animal's physical, health and behavioural needs and to alleviate their pain and distress. In the Codes of Welfare issued by the Minister for Primary Industries (under the Animal Welfare Act 1999), each of the main farmed animal species has a separate code.

Although New Zealand does not have serious infectious diseases such as foot-and-mouth or mad cow disease, there are some that can seriously affect animal health and production. Several may be passed on to humans and are known as zoonotic diseases so have the potential to affect food quality and public health. These include tuberculosis (*Mycobacterium bovis*), leptospirosis (*Leptospira pomona*) and E.coli. Tuberculosis and residues of antibiotics in milk or meat are a food safety issue, leptospirosis a workplace health issue and E.coli an environmental issue affecting water quality and downstream water users.

The New Zealand farmer is always on the lookout for animal health problems, including contagious illnesses, diseases of reproduction and the nervous system, internal and external parasites, poisoning and metabolic illnesses caused by nutrient deficiencies. Many of these occur only sporadically and are easy to cure, but two – tuberculosis (TB) and internal parasites of sheep and cattle – may threaten farming in the future. Tuberculosis is difficult to control because it is endemic in wild possums and ferrets, which can re-infect domestic stock. Internal parasites of sheep and cattle can become resistant to the anthelmintic used to control them.

Measurements of animal welfare and health are to do with the implementation of practices that effectively promote the health of animals while reducing the use of veterinary drugs and preventing animal losses due to disease and injuries. Hence and overarching measurement of animal welfare is:

"Animals are kept under species-appropriate conditions and free from hunger and thirst, discomfort, pain, injury and disease and distress" (SAFA, 2013a: 81).

The minimum threshold is compliance with the codes of welfare (under the Animal Welfare Act 1999).

Outcome G5: Management approach is holistic

Definition of holistic management

“Holistic management (often termed sustainability management) is defined as management that aims at the continuous improvement of environmental integrity, economic resilience, social well-being and good governance, with the ultimate goal of operations being fully in line with a sustainable development of society” (SAFA, 2013a: 67).

Description

The outcome, ‘management approach is holistic’, ideally flows on from that of ‘governance structure is effective’ as a governance structure is set up to enable holistic management to happen. If sustainability is to become a core part of an enterprise’s culture and practice, then the governing body and the management must lead by example. For this to happen it is better that sustainability ideas are integrated into the *“mission/vision, goals and objectives, values, strategy, operations, and reporting”* (IFAC, 2011: 31) as drivers of a business rather than just as a compliance function because it is then more likely to become an accepted part of an enterprise and it will generate added value for the enterprise (IFAC, 2011: 31). As DairyNZ (2007) states, this starts out with a vision: *“Having extreme clarity of vision for what [you] want to achieve is the single most motivating factor in obtaining the life or business [you] want”*.

The objectives in the NZSD translate directly from the SAFA (2013b) sub-themes, to become ‘implement a sustainability management plan’ and ‘practice full cost accounting’. Table 3.7 presents these objectives and their associated indicators. In the NZSD we could have added ‘marketing plan’ and ‘methodologies and tools’ to meet the needs of New Zealand primary producers and farm management but these are already incorporated into the economic resilience dimension and governance structure theme respectively.

Objective G5.1: Implementing a sustainability management plan

Sustainability management plans are used by an enterprise with the objective of providing *“good governance guidance for its sustainability efforts and to assist in incorporating the values and aspirations for sustainability to be formally included in business planning”* (SAFA, 2013a: 139). Therefore, once incorporated, governance bodies have the power *“to hold management accountable for implementing the direction and targets set for the organization”* (SAFA, 2013a: 139).

As evidenced by the proliferation of advice and guidelines on sustainability planning and reporting, having a sustainability management plan is becoming the ‘right thing to do’ for business enterprises in the western world (e.g., SAFA, GRI, FRC, IFAC, IIRC etc.).

Table 3.7: Objectives associated with Outcome G5: Management approach is holistic

| Objectives | | Indicators | | Indicators Description | Key Links |
|------------|---|------------|--------------------------------|--|----------------------|
| G5.1 | Implementing a sustainability management plan | G5.1.1 | Sustainability Management Plan | "Sustainability plans are used by an enterprise to provide good governance guidance for its sustainability efforts and to assist in incorporating the values and aspirations for sustainability in business planning. The business planning cycle enables governance bodies to hold management accountable for implementing the direction and targets set for the enterprise ... there is a need to ensure that these plans are holistic and cover each of the four pillars of sustainability" (SAFA, 2013c: 44). The sustainability plan must contain both objectives or aims and targets an enterprise wishes to achieve, in order for its progress towards these targets can be measured and publicly reported on. | SAFA |
| | | G5.1.2 | Assurance schemes | Compliance with other sustainability schemes such as GlobalGAP and organic certification also demonstrate an enterprise's commitment to sustainability. | GlobalG.A.P., BioGro |
| | | G5.1.3 | Cooperation | For a sustainability plan to be implemented it requires the full cooperation of the employees, management and the governance body. | SAFA |
| G5.2 | Practicing full-cost accounting | G5.2.1 | Full cost accounting | "Traditional accounting systems deal predominantly in actual dollar costs in the current year. Matters outside of this, particularly where the dollar cost is difficult to determine or has not been valued, are treated as externalities ... As consumers, stockholders and other stakeholders become more aware and concerned about the potential environmental and social impacts of business they are demanding better information about the organization's performance in these areas. This movement began as 'Triple bottom line' reporting, demanding that an organization's performance needs to be assessed in economic, social and environmental terms" (SAFA, 2013c: 46). This requirement has become known as 'full cost accounting' and "will enable enterprises' to make better decisions because they more fully understand the full impact of their decisions ... The full cost accounting process makes transparent both direct and indirect subsidies received, as well as direct and indirect costs" (SAFA, 2013c: 46). | SAFA |

A plan is “simply a systematic plan of action” (DairyNZ, 2007). According to IFAC (2011: 44-45), a plan should establish goals, targets, and performance measures, identify outcomes where possible, engage employees involved in executing strategy, and establish a baseline against which progress can be monitored.

An enterprise is likely to increase its sustainability if it includes in its management plan, cooperation with and participation in research projects, industry extension events, exchange with peers and contribution to industry good. Through involvement in research, discussion groups, field days and other industry extension, those who work in or own agricultural enterprises increase or add to their skills and knowledge on how to carry out current and future requirements of the enterprise to compete in the global business arena (DairyNZ, n.d.b).

Those who use the NZSD may already be involved in some form of compliance with an established market assurance plan. The vision of the NZSD is for it to be used throughout product supply chains by market assurance programmes and to provide regular feedback to enterprises for learning.

The first indicator of the objective ‘implementation of a sustainability management plan’ is the existence of such a plan which should include the four pillars of sustainability, objectives directed towards sustainability performance and targets to measure the direction of the attainment of sustainability, and whether or not the plan is used in decision making (SAFA, 2013a: 139). A second indicator shows if the enterprise is enrolled in assurance schemes and complies with them. A final indicator is the degree of cooperation of employees, managers and the governance body in ensuring the sustainability plan is implemented.

Objective G5.2: Practicing full cost accounting

The objective ‘practice full cost accounting’ is included to demonstrate that *“the business success of the enterprise is measured and reported taking into account direct and indirect impacts on the economy, society and physical environment (e.g., triple bottom line reporting), and the accounting process makes transparent both direct and indirect subsidies received, as well as direct and indirect costs externalized”* (SAFA, 2013a: 68).

Traditionally, reporting on enterprise's performance has been through the presentation of financial accounts but this process has been under challenge for some time. One of the substitutes for traditional practice is that of ‘triple bottom line’ reporting, which is a method of accounting that assesses an enterprises performance in economic, social and environmental terms (SAFA, 2013a; Group 100, 2013). In this way the environmental and social risks that have the capacity to affect financial performance can be identified and taken into account (Group 100, 2013: 6). Other substitutes for traditional accounting methods have been called social auditing and environmental accounting, and these can be incorporated under the name of ‘full-cost accounting’ (SAFA, 2013a: 141).

Examples of externalities are greenhouse gases and nutrient losses to water, which have a cost to the wider community but the cost is not always put against the business/emitter. As SAFA states, *“As consumers, stockholders and other stakeholders become more aware and concerned about the potential environmental and social impacts of business they are demanding better information about the organizations performance in these areas”* (SAFA, 2013a: 141).

Measurements of the indicator ‘full-cost accounting’ could be based on whether or not the enterprise has evidence that it collects, analyses and reports to its stakeholders on its economic, social and environmental impacts and performance (SAFA, 2013a: 142).

Conclusion

This chapter has set out and justified the framework for the NZSD's ‘good governance’ pillar and suggested some KPIs which may be used to measure progression towards such good governance. It draws heavily on the SAFA (2013a, b) guidelines, and is backed up by many other international business reporting organisations which support the inclusion of governance in their sustainability assessments. Little support has been drawn from New Zealand because there has been little emphasis to date on good governance, except in the Māori cultural context, and the NZSD will help to address this gap. Overall it indicates how the factors which demonstrate good governance are also strongly related to economic resilience and social well-being, demonstrating the interlinked nature of sustainability.

Chapter 4: Measuring the economic resilience of New Zealand's primary-based industries

Economic resilience – sustains an economy through change and shocks

To be economically resilient an enterprise's financial well-being is maintained, its vulnerability minimised, the products it produces are of good quality, accompanied by adequate information, and efficiently produced, and it creates value in the local community.

Economic resilience

Economics is about maximising social welfare subject to resource constraints. Thus, if, as is generally assumed, we want more than we have, then limited resources are in demand to meet unlimited 'wants'. 'Resource' is an all-encompassing expression which is why economics can be so broad within its context. Hence economics is to do with the allocation and choice given to scarce resources, which is measured by the opportunity cost of the next best alternative to that action - or to put it more simply, "What you would have done if you didn't make the choice that you did". Economic resilience considers the resilience of resources. For example, climate change may alter the frequency of droughts and therefore the risk profile of available resources.¹⁸

The NZSD is attempting to serve enterprises at many levels – owner-operated farm business, agribusinesses such as wineries and packhouses, to provide audit and quality oversight, and to possibly generate sector, regional and national information. Therefore, while there is a focus on the 'enterprise' level in this report there is a need to keep in mind that there is an overall generic quality to the NZSD framework. Hence, it must be emphasised that the economic pillar is about resilience, and not just about financial performance. Financial performance is one of the indicators of resilience. The NZSD is not seeking to duplicate the work of a financial auditor to express an opinion on the financial accounts but to assess economic sustainability. Most business enterprises will produce an annual report with a set of accounts as part of their accountability (see the chapter on Good Governance) which will have information relating to an enterprise's economic performance. Therefore, to be economically resilient not only is an enterprise's financial well-being maintained, but also its vulnerability is minimised, the products it produces are of good quality, accompanied by adequate information, and efficiently produced, and it creates value in the local community. Or, to be more specific, *"To be considered economically sustainable an enterprise should be capable of paying all its debts, generating a positive cash flow and adequately remunerating workers and shareholders. In addition it should have buffer mechanisms (savings, assets) to cope with changes and shocks out of its control, for example, economic downturns, damaging weather. In essence it must be economically resilient"* (SAFA, 2013a: 56).

¹⁸ Personal communication with Caroline Saunders.

According to SAFA (2013a:56) “economic activity involves the use of labour, land and capital to produce goods and services to satisfy people’s needs” and “sustainability is directly linked with the fulfilment of needs, a pillar of sustainable development as defined by the World Commission on Environment and Development (WCED, 1987). Sustainability in the social and environmental domains is supported by functioning businesses.” This indicates how closely the three pillars of sustainability are closely aligned and inter-related.

With reference to the distinction made above, some tend to confuse financial indicators with economic ones. The former usually only include those which are market oriented and are only a subset of our resources.¹⁹ Historically, in anything to do with the primary industries in New Zealand, this - with production statistics - was all that was measured – usually in the form of ratios such as production/ha, efficiency (costs/revenue). This is probably because these measures would be free of units and so comparable across different industries, businesses, sectors etc. However, it has been found that these ratios differ by industry grouping, size of firm, and location (Stats NZ, 2013). Also, it appears that the use of aggregate level data has declined, meaning that it has been found that several areas of an enterprise need to be assessed rather than producing one overall index of economic sustainability. More recently there has been an increasing focus on intangibles such as branding and staff training, rather than physical resources such as plant and machinery (Saunders et al. 2006:16-17). (Ironically, it is suggested that in evaluating intangibles they must be operationalised, benchmarked, assessed and improved on.)

Error! Reference source not found.2.5, in Chapter 2, presented the sources which are used to inform the development of the economic resilience pillar of the NZSD.

Farm management and economic resilience

Farm Management deals with decisions on the use of scarce farm resources, to obtain maximum profit and family satisfaction on a continuous basis from the farm (Martin et al., 2005). It integrates the four dimensions of governance, agro-environmental integrity, economic resilience and social well-being. In business, successful management of sustainability performance is achieved if the management of environmental, social and governance issues are in line with increased competitiveness and economic performance. One particular challenge to sustainability management is finding appropriate ways of dealing with trade-offs between sustainability goals. Holistic farm management is about striking a balance between short and long-term interests, economic, social and environmental concerns, stakeholders and shareholders (Kelly and Bywater, 2005).

The introduction of something new (e.g., a piece of technology) or a change to an existing part of the system is likely to impact on other parts of the farm system. Therefore, understanding the wider impacts on the system is fundamental to effective farm management. An example of this is the introduction of irrigation onto a property.

¹⁹ Personal communication with Caroline Saunders.

Irrigation is usually installed to increase production, improve product quality and reliability, and reduce risk of drought. However, irrigation development often involves increasing business debt and all of these impact on economic resilience. The use of irrigation has other impacts in the environmental and social spheres which are described elsewhere.

Measuring the sustainability of management practices

The use of physical and financial performance indicators and benchmarking for the financial analysis of businesses is a widespread practice throughout the New Zealand primary sector. Benchmarking involves the comparison of a performance indicator derived for one business with the same performance indicator derived for one or more other businesses (Shadbolt and Bywater, 2005). Benchmarking therefore focuses on the key variables influencing productivity, profitability, liquidity and solvency. Through 'benchmarking' a farm business manager would:

- Measure current physical, ecosystem, social and financial performance;
- Identify areas of performance where improvement needs to be made;
- Identify changes which can be made to current husbandry and business management processes and practices in order to improve enterprise and/or whole farm performance.

"A manager may use a range of key performance indicators that are an index of a set of performance measures to provide an indication of the overall performance of the business. These measures must be tightly linked to the farmer's goals" (Gray, 2005: 51). Factors can be measured objectively using some form of instrument (e.g., scales, refractometer for fruit sugar) or subjectively using visual assessment. Monitoring frequency is an important consideration. *"Factors must be monitored at a frequency that allows the farmer time to take effective corrective action. The frequency for any particular factor will be dependent on the factor and the nature of the production cycle"* (Gray, 2005: 51). Too frequent monitoring can become costly.

Increasingly, information has to be collected to meet compliance requirements and quality assurance for products. Farm managers also find they can use this information for benchmarking to achieve continuous improvement in their business management systems (Shadbolt and Bywater, 2005). All properties have annual accounts with additional information on production inputs and outputs. Some vineyards/wineries have adopted enterprise budgeting which tracks all expenditure and production down to a block level. Precision viticulture and agriculture can take it to a smaller scale.

Financial information in farm businesses is available from a number of sources: bank statements, cashbooks, annual tax accounts, discussion group analysis and various financial benchmarking services (e.g., Dairybase, Redskies). The key is to use this information to make better financial decisions. Sound financial management involves targeting and monitoring three critical outcomes of liquidity, wealth creation and profitability (Shadbolt and Gardner, 2005).

Placing sustainability in context

Before decisions can be made about the level of sustainability of an enterprise through the use of the NZSD, the context of the enterprise needs to be known in order for like to be compared with like. In terms of economic resilience and sustainability this information is often required:

- Sector
- Size and structure of enterprise, age – years trading,
- Ownership: publicly listed company, private company, owner operated
- Family business (yes/no).

As many of the enterprises that will be using the NZSD will be family businesses other aspects which are unique to such a business type may be useful, such as:

- Is the Manager the sole decision maker?
- Is the manager employed elsewhere?
- Is family income used for the business? Is family labour used?
- Is time transferred from work to the family and vice versa?

It is likely that when a person logs onto the NZSD, it immediately identifies what is already known about them and their business and anything they enter is placed into a context without them needing to enter any further information.

Collecting national statistics

Statistics NZ uses economic statistics to measure economic resilience at a national level and often reports them as 'per person'. According to Stats NZ (2009) these are the variables that are important nationally:

- Real net stock of total assets per person
- Real net stock of infrastructure per person
- Real investment in fixed capital per person
- Ratio of debt services to export earnings
- Diversity of exports
- Government debt

The size of a business as an indicator

The measure of economic value generated by a business should be included in the NZSD because it is a context variable indicating the size of the business. When measured as an absolute value it is unlikely to be included in the NZSD's output but it is needed in other important calculations. This variable can be expressed as:

- Revenue/income/turnover/Gross Business Revenue/GFR/GOR – measured in dollars (\$), \$/ha, \$/FTE, \$/SU, \$/tray, \$/litre, \$/kg.

This variable needs to be related to something else as total revenue on its own is a context variable. As indicated above, some units could be \$/ha and \$/production unit. Both these measures are dependent on sector, location, and 'crop'.

Other measures of business size are:

- Production area in hectares – if a farm/orchard/vineyard of some sort – effective ha (cash crop area, new grass area, canopy area)
- No. of employees/total labour units (family, other, working owners).

Indicators using financial data

The financial data which can be collected about the economic well-being of a business enterprise can be classified in three basic ways - what comes in (A), what goes out (B), and what is left over (A-B). As is evident already from this description, only two of these variables are needed to obtain the third. Each of these is meaningless however, because businesses can vary so much in size, therefore, useful indicators are usually measured in terms of a ratio of some sort that enables comparisons across businesses of different sizes. Hence a measure is likely to be expressed in terms of dollars (e.g., profit) per hectare (ha), per FTE, per stock unit (SU), per production unit (tray of fruit, litre of wine, kg of meat/milk solids) or in percentage terms such as expenses to total revenue.

Indicators of sustainability to do with work and employment

To be sustainable an enterprise would wish to employ the most suitable people it can obtain to do the work it requires and to maintain good relationships and conditions for these employees so that they will continue to work for the enterprise. In other words, a business is dependent on the people it employs and the work that they do. Therefore, the 'people' side of sustainability and resilience is a theme which could appear in both the economic and social dimensions. It should be noted that the place of seasonal work is a challenge for sustainability measures. SAFA (2013b) and GRI (G4) place this aspect – employee working environment - in the social dimension. As a result it is only touched on here to draw attention to the links between the social and economic pillars. The chapter on social well-being will delve into this more fully. It is not represented in the economic resilience framework.

If an enterprise wants to have motivated, skilled, capable, productive employees it will often provide or support employees continuing education and skills training and reward employees according to their capabilities and performance. An enterprise may wish to have a social diversity of employees and have measures in place to ensure that it has equity and non-discriminatory practices in the employment of men and women, and people of differing ethnic and religious backgrounds, for example. Hence, an enterprise may wish to keep information related to the skills, qualifications and experience of their employees, the amount spent on training provision/skills enhancement, employee's productivity, and gender diversity.

Fitting a framework to the NZSD

The indicators described in this chapter fall into two groups. Firstly, financial data to do with the economic value generated by products produced by an enterprise, the costs and expenses associated with that production, the profit made and the efficiency of production. Other indicators associated with the 'business' of an enterprise relate to

topics of interest to management, shareholders and the market in general. Secondly, there is a group of indicators that relate to more broad economic themes – procurement, investment, risk/vulnerability, employment and compliance.

It was decided that there are several other ways in which these indicators can be grouped so in order to match with international frameworks it was better to go with the SAFA (2013b) framework for Economic Resilience (shown in **Error! Reference source not found.**) for the NZSD. However, in planning the NZSD framework for this pillar it was noted the importance placed on indicators to do with financial management and production in many frameworks from New Zealand organisations (see Hunt, 2013a), therefore, outcomes relating to these topics were added to the NZSD and named accordingly. The 'Financial well-being of enterprise' outcome incorporated the SAFA theme of 'Investment' and some of the SAFA sub-themes (Figure 4.1 and Table 4.1). The original SAFA (2013b) theme has 4 sub-themes, whereas the NZSD 'Financial well-being' outcome has six objectives. The other SAFA themes of 'Vulnerability', 'Product quality and information' and 'Local economy' were kept, though it was felt that 'Product quality and information' could equally have been fitted into Governance. The 'Vulnerability' theme had five sub-themes in SAFA and those have been incorporated into three objectives. Hence the NZSD framework has five outcomes compared with SAFA's four themes.

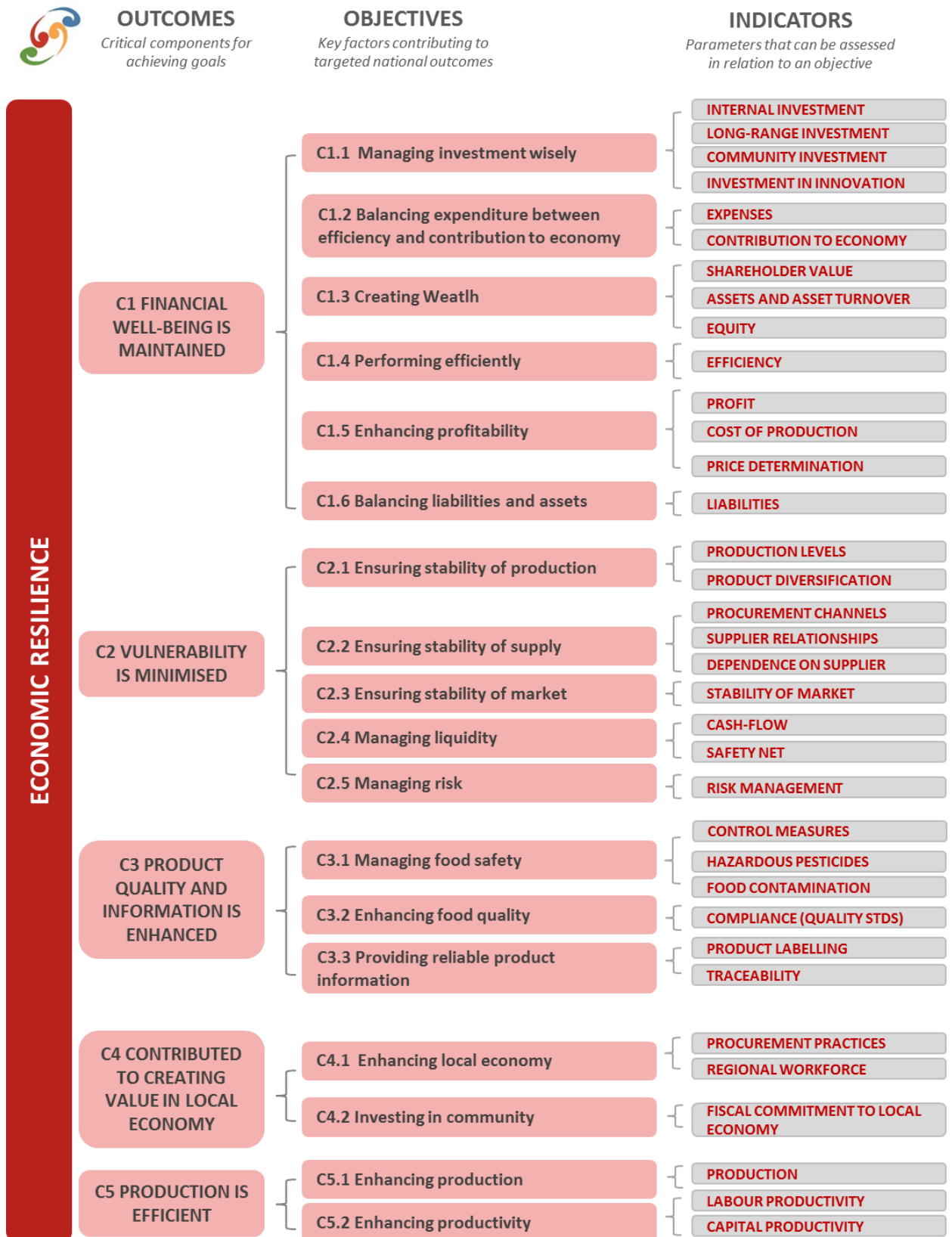


Figure 4.1: Economic Resilience Framework in the NZSD

Table 4.1: The NZSD Framework for Economic Resilience

| | Outcomes | Outcomes description | | Objectives | | Indicators |
|--------|---|--|-------------|--|--------|-------------------------------------|
| | Critical components for achieving goals | | | Key Factors contributing to Outcomes | | Parameters that can be addressed |
| C1 | Financial well-being is maintained | The ability to make wise decisions on earnings, savings, loans and other credits that enables an enterprise to attain its goals. A healthy enterprise is able to withstand changes in the economy and business environment. | C1.1 | Managing investment wisely | C1.1.1 | Internal investment |
| | | | | | C1.1.2 | Long-range investment |
| | | | | | C1.1.3 | Community investment |
| | | | | | C1.1.4 | Investment in innovation |
| | | | C1.2 | Balancing expenditure between efficiency and contribution to economy | C1.2.1 | Expenses |
| | | | | | C1.2.2 | Contribution to economy |
| | | | C1.3 | Creating wealth | C1.3.1 | Shareholder value |
| | | | | | C1.3.2 | Assets |
| | | | | | C1.3.3 | Equity |
| | | | C1.4 | Performing efficiently | C1.4.1 | Efficiency |
| | | | C1.5 | Enhancing profitability | C1.5.1 | Profit |
| | | | | | C1.5.2 | Cost of production |
| C1.5.3 | Price determination | | | | | |
| C1.6 | Balancing liabilities and assets | C1.6.1 | Liabilities | | | |
| C2 | Vulnerability is minimised | The capacity of an enterprise to prevent, mitigate or cope with risk is maximised through securing the resilience of production, supply and marketing in the face of environmental variability, economic volatility and social change, and managing well liquidity and risk. | C2.1 | Ensuring stability of production | C2.1.1 | Guarantee of production levels |
| | | | | | C2.1.2 | Product diversification |
| | | | C2.2 | Ensuring stability of supply | C2.2.1 | Procurement channels |
| | | | | | C2.2.2 | Stability of supplier relationships |
| | | | | | C2.2.3 | Dependence on leading supplier |

| | Outcomes | Outcomes description | | Objectives | | Indicators |
|----|--|--|------|--|--------|------------------------------------|
| | Critical components for achieving goals | | | Key Factors contributing to Outcomes | | Parameters that can be addressed |
| | | | C2.3 | Ensuring stability of market | C2.3.1 | Stability of market |
| | | | C2.4 | Managing liquidity | C2.4.1 | Cash-flow |
| | | | | | C2.4.2 | Safety nets |
| | | | C2.5 | Managing risk | C2.5.1 | Risk management |
| C3 | Product quality and information is enhanced | Any contamination of produce with potentially harmful substances is avoided, and nutritional quality and traceability of all produce are clearly stated. | C3.1 | Managing food safety | C3.1.1 | Control measures |
| | | | | | C3.1.2 | Hazardous pesticides |
| | | | | | C3.1.3 | Food contamination |
| | | | C3.2 | Enhancing food quality | C3.2.1 | Compliance (quality standards) |
| | | | C3.3 | Providing reliable product information | C3.3.1 | Product labelling |
| | | | | | C3.3.2 | Traceability |
| C4 | Contributed to creating value in local economy | Through production, employment, procurement, marketing and investments in infrastructure, the enterprise contributes to sustainable local value creation. | C4.1 | Enhancing local economy | C4.1.1 | Procurement practices |
| | | | | | C4.1.2 | Regional workforce |
| | | | C4.2 | Investing in community | C4.2.1 | Fiscal commitment to local economy |
| C5 | Production is efficient | The goods/products produced by an enterprise. The processes and methods used to transform tangible inputs (raw materials, semi-finished goods, subassemblies) and intangible inputs (ideas, information, knowledge) into goods or services. Resources are used in this process to create an output that is suitable for use or has exchange value. | C5.1 | Enhancing production | C5.1.1 | Production |
| | | | C5.2 | Enhancing productivity | C5.2.1 | Labour productivity |
| | | | | | C5.2.2 | Capital productivity |

Outcome C1: Financial well-being is maintained

An enterprise will achieve financial well-being if it has the ability to make wise decisions on earnings, savings, loans and other credits that enable it to attain its goals. A healthy enterprise is able to withstand changes in the economy and business environment.

Financial well-being is maintained by managing investment wisely, balancing expenditure between being efficient and the contribution such expenditure makes to the economy, creating wealth, performing efficiently, enhancing profitability, and balancing liabilities and assets. As part of this balancing act, the enterprise has to manage credit – the ability to borrow money, and to purchase or sell goods with payment delayed beyond delivery. It is important for an economy to have a steady flow of credit.²⁰ These objectives and their indicators are described in the next sub-sections (Table 4.2).

Objective C1.1: Managing investment wisely

According to SAFA (2013a: 82) investment is seen from the microeconomic perspective. *“It is putting money into something ... with a view to gain”*. This is relevant to sustainability because *“improved production and marketing and transfer of financial resource and knowledge are critical to ensure that economic growth leads to social development while preserving or enhancing the natural resource base”*. Where an organisation puts its investments indicates its aims. Investments into the community declare the wish of the organisation to be seen as being a good citizen. SAFA adds that investment in PR does not fit into this theme!

Investment is usually measured in a quantitative fashion but SAFA (2013a) takes an alternative approach from that used in earlier versions of SAFA (FAO, 2012a, b) and asks for information or else a yes/no response. The contrast between these two approaches is apparent in the indicators and their possible measures shown next.

- Internal investment: To demonstrate what this might mean this indicator could have measures such as:
 - Percentage of revenue that is invested into research/innovation, capacity-building and infrastructure that improves sustainability performance (FAO, 2012a).²¹

²⁰ <http://financial-dictionary.thefreedictionary.com/credit>

²¹ The perspective of looking at investment as a percentage of revenue seems to be a change in thinking. However, the investment in R&D seems often to be part of a company's annual report and might be compared to a particular year as a baseline. For example, GE invested \$2 billion in R&D in 2012 and generated some \$25 billion in revenue (8%), gave \$219 million to community and educational organisations (0.9%). See http://www.sustainablebrands.com/news_and_views/articles/ge-generates-25-billion-revenues-sustainability-investments

Table 4.2: Objectives and indicators for the 'Financial well-being is maintained' (C1) outcome

| | Objectives | | Indicators | Indicators Description | Key Links |
|------|--|--------|---------------------------|--|-------------------------------------|
| C1.1 | Managing investment wisely | C1.1.1 | Internal investment | Revenue invested into research/innovation, capacity-building and infrastructure that improves sustainability performance. | SAFA GRI (G4) Montreal process |
| | | C1.1.2 | Long-range investment | Investment in production facilities, resources, market infrastructure, shares and acquisitions aim at long-term sustainability rather than maximum short-term profit. Includes business planning to maintain and increase capacity to produce long-term profits. | SAFA GRI (G4) Montreal process |
| | | C1.1.3 | Community investment | Revenue that is invested into the maintenance or rehabilitation of common goods (soils, water, forests etc.) and into capacity-building at community level. | SAFA GRI (G4) Montreal process |
| | | C1.1.4 | Investment in innovation | Revenue invested in research/innovation. | SAFA Saunders et al. Stats NZ |
| C1.2 | Balancing expenditure between efficiency and contribution to economy | C1.2.1 | Expenses | The costs to produce a 'product'. Costs or expenses can be seen by an enterprise as negative – as a constraint on profit – therefore, an enterprise will often seek to minimise costs to make it economically sustainable. | SAFA MPI, Dairy NZ Beef+Lamb |
| | | C1.2.2 | Contribution to economy | Costs can be seen as a distribution or contribution by an enterprise to a country's economy, hence the relationship to a nation's sustainability. | SAFA, Stats NZ |
| C1.3 | Creating Wealth | C1.3.1 | Shareholder value | The value delivered to shareholders because of management's ability to grow earnings, dividends and share price. | GRI (G4) |
| | | C1.3.2 | Assets and asset turnover | A resource with economic value that is owned by someone or something that is capable of generating cash flow and the value of this compared with revenue. | GRI (G4) |

| | Objectives | | Indicators | Indicators Description | Key Links |
|-------------|---|---------------|----------------------------|--|---|
| | | C1.3.3 | Equity | The amount of an enterprise that is 'owned' compared with its total value. | GRI (G4) |
| C1.4 | Performing efficiently | C1.4.1 | Efficiency | The use of resources that maximises the production of goods and services. | SAFA MPI, Dairy NZ |
| C1.5 | Enhancing profitability | C1.5.1 | Profit | Through its investments and business activities, the enterprise has the capacity to generate a positive net income yielding a financial profit. | SAFA MPI, Dairy NZ, GRI (G4) |
| | | C1.5.5 | Cost of production | The costs incurred during a given time period to acquire and transform direct materials, so as to produce and sell revenue generating products, goods and/or services. | SAFA |
| | | C1.5.6 | Price determination | The decision regarding the amount at which products and services can be sold. | SAFA |
| C1.6 | Balancing liabilities and assets | C1.6.1 | Liabilities | An asset is something which the enterprise owns and a liability is something which the enterprise owes. | SAFA Dairy NZ |

- *“In which activities have you invested during the last 5 years to improve and monitor your social, economic, environmental and governance performance?”* (SAFA, 2013a: 83).

One aspect of investment particularly associated with farm management is to do with infrastructure. On many New Zealand farms, the investment in machinery and plant is relatively small but on arable farms, wineries, irrigated or intensive dairy farms the investment can be substantial. When plant and machinery are a significant part of the total asset, it is logical to revalue them for analytical purposes. There needs to be measures that show if the plant and machinery are serving the business's needs or, at the other end of the spectrum, whether there is over-capitalisation of plant and machinery. It may be that the farm manager is enjoying the machinery aspect of farming to the detriment of the business operation. He may have what is known in farming circles as 'heavy metal disease'!

- Community investment: To demonstrate what this might mean this indicator could have measures such as:
 - Percentage of total revenue that is invested into the maintenance or rehabilitation of common goods (soils, water, forests etc.) and into capacity-building at community level (FAO, 2012a).
 - *“How have your investments contributed to address and meet community needs, with an efficient use of resources and maintaining an environmental balance”* (SAFA, 2013a).
- Long-ranging investment: To demonstrate what this might mean this indicator could have measures such as:
 - Investment into production facilities, resources, market infrastructure, shares and acquisitions aim at long-term sustainability rather than maximum short-term profit. Includes business planning to maintain and increase capacity to produce long-term profits.
 - Ratio between actual and necessary investment into maintenance of production facilities (taking into account capital availability) (FAO, 2012a).
 - Do the enterprise investments aim to establish and reinforce the conditions that maintain, generate and increase the enterprise profits in the long-term? (SAFA, 2013a).
 - Do you have a business plan or an up-to-date document articulating revenue streams, growth plan, and an operational action plan that projects the generation of financial resources for the future? (SAFA, 2013a).

SAFA (2013c: 164) includes long-term profitability as an indicator in the long-ranging investment theme and measures it by whether or not the organisation/business is breaking even. In the NZSD this indicator could be a measure in the 'profitability' indicator because of the emphasis on this in New Zealand sustainability schemes.

- Investment in innovation: According to a prominent American businessman, “Innovation and new technology provide a counterweight to business as usual ... Innovation and new technology provide a way to improve our social progress through smarter ways of conducting our activities”.²² Incidentally, participation in sustainability initiatives is also seen as a driving force of innovation and as commercially advantageous (Nidumolu et al., 2009). The expenditure on innovation is sometimes contained within the investment theme and sometimes regarded as a theme in itself. SAFA does not refer to it directly. Some would call it investment in Research and Development (R & D). It could be positioned and measured in several ways:
 - As part of internal investment – see above
 - Change of investment on innovation over time
 - Research and development expenditure as a proportion of GDP/Revenue
 - Research and development expenditure by purpose
 - Personnel involved in research and development
 - Rate of innovation by type.

Saunders et al. (2007c) propose that measurements of innovation include:

- Number of new products trialled or sold
- Number of new processes or techniques attempted or adopted
- Use of ICT
- Investment capital/change in capital.

Objective C1.2: Balancing expenditure between efficiency and contribution to economy

The costs to produce a ‘product’ also should be measured. Costs or expenses can be seen by an enterprise as negative – as a constraint on profit – therefore, an enterprise will often seek to minimise costs to make it economically sustainable. However, this attitude can be reframed so that costs are seen as a distribution or contribution by an enterprise to a country’s economy, hence the relationship to a nation’s sustainability.

For example, indicators could be:

- Expenses/costs (economic value distributed).
- Direct contribution to New Zealand’s economy through wages, salaries, benefits, taxes, NZ-based supplier contracts.

Costs/expenses can be broken into many different components that may be of particular interest. It is important for enterprises to find out where their expenditure is and what proportion one expense is in relation to another or to the total expenditure. Expenses/costs which are commonly measured in an agricultural enterprise are:

²² From an interview between the president of the World Council for Sustainable Development and the Dow Corning vice president. See:
http://www.dowcorning.com/content/publishedlit/solarticles/How_Innovation_Supports_Sustainability.pdf

- Wages (divided up depending on industry)
- Animal health
- Weed and Pest
- Fertiliser
- Lime
- Vehicles and fuel
- Electricity
- Feed and grazing
- Cash crop
- Repairs and Maintenance (R&M)
- Insurance & ACC
- Rates
- Interest
- Rent.

In the particular example of dairy farming, expenses are broadly to do with (details available in Hunt, 2013b):

- Stock
- Feed
- Supplements
- Grazing and Run-off
- Other – fertiliser, nitrogen, irrigation, re-grassing, weed & pest, vehicles, fuel, R&M, freight
- Overheads

Objective C1.3: Creating wealth

Wealth creation is one of the key goals for most primary based businesses. It provides a pathway into property ownership and managing succession between generations. According to Shadbolt and Gardner (2005: 155), *“Equity is a measure of wealth, the capacity of a business to withstand adversity and to cope with risk”*. Wealth creation requires a range of skills including strategic management, planning, financial management and successful relationships with people. The value of an enterprise - the total wealth of a company can be measured in many ways and usually several of these variables are used:

- Total assets at close.
- Liabilities at close.
- Total equity.
- Growth in equity.
- Growth from profit.
- Growth from capital.
- Debt to Assets.

Indicators

- Shareholder value. Shareholders in a business usually invest to get a return, to make some money from their money. A sustainable business needs to be

attractive to investors. Shareholder value is the value delivered to shareholders because of management's ability to grow earnings, dividends and share price.²³ (This may be irrelevant to some enterprises in the industries involved in a NZSD case study because many will be owner operated.) There are many ways of measuring the value of an enterprise and therefore of the wealth it is creating. One is Economic Value Added (EVA), which is a measure of capital on which the IIRC value creating model is based (see Hunt, 2013: 29). It is centred on inputs, value adding activities and outputs. Another measure is Return on Capital (ROC) – the return to an enterprise on the capital value of the enterprise, or, return on invested capital - the return to an enterprise or an investor on the amount the enterprise or investor has invested. The actual return to an investor is the dividend – the sum of money paid regularly by a company to its shareholders out of its profits. This may not be applicable to the small family businesses involved in the NZSD but it will be applicable to the larger organisations.

- Assets – a resource with economic value that is owned by someone or something that is capable of generating cash flow. Apart from its importance in itself it is also used to calculate other useful data such as Return on Assets (ROA) which measures how profitable an enterprise is relative to its total assets and asset turnover, a comparison between an enterprise's revenue and its assets, which is a useful way for companies to find out whether they are growing revenue in proportion to sales.
- Equity – the amount of an enterprise that is 'owned' compared with its total value (the difference between the two being the amount that is mortgaged or borrowed – the liability). When measured, this indicator can be used to produce other useful information such as return on equity which, like return on capital, shows the return a business is making on what it owns.²⁴

Objective C1.4: Performing efficiently

An efficient enterprise is one that maximises the production of goods and services from its resources. In other words, it makes the most it can from what it has.

Indicator

- Efficiency - efficiency can be measured by the proportion of income that has been spent on producing an enterprise's products. If this is too high then the business will not be sustainable as it will go into debt, or else not produce enough to provide a living for those dependent on it.

²³ <http://www.investopedia.com/terms/s/shareholder-value.asp>

²⁴ If the return on equity averages 10-15% then that is good. A value higher than this is likely to be unsustainable. See <http://beginnersinvest.about.com/od/incomestatementanalysis/a/understanding-return-on-equity.htm>.

Objective C1.5: Enhancing profitability

Through its investments and business activities, the enterprise has the capacity to generate a positive net income yielding a financial profit. In other words, profitability is the degree to which the enterprise is breaking even, or it is what is left over from the total revenue when the costs have been accounted for. Hence the profit is dependent on the cost of production and the price paid for the products produced by the enterprise in the marketplace.

All businesses measure their success in terms of their profit. This measures the sustainability of a business because it is out of this profit the business may provide for its future investment and encourage its shareholders to continue their support. In a family agribusiness it is the profit that provides income for the family to live.

The usual measure of profitability is the simple rate of return or the payback period of an investment. According to a farm accountancy firm, *"the more relevant factors driving profitability are scale of the farm business, land productivity (operating surplus divided by land value), labour productivity, crop/livestock productivity and marketing relationships"* (Boyce Chartered Accountants, 2000, as cited in Wilson et al., 2005: 49). If the NZSD project ventures into enterprise analysis a useful indicator could be Net Present Value (NPV) which uses the productivity concept and is therefore a more accurate KPI of profitability. It not only considers cash flows over the entire life of the project but also the time value of money. The NPV for an investment is determined by discounting the cash flows for each year then summing across all the years. For example, you would use it for an irrigation development or to evaluate whether to change a grape variety across a block.

Indicators:

- Profit (economic value retained) –can be measured in many different ways. For example there is: profit before tax (e.g., Farm Profit Before Tax (FPBT)), Earnings Before Interest and Tax (EBIT), economic surplus (e.g., Economic Farm Surplus (EFS)), gross margin, profit after tax, the operating profit margin which shows how efficiently management uses labour and raw material in the production process, and net income – an enterprise's total earnings or profit, which is an important measure of how profitable an enterprise is over time and is often referred to as "the bottom line".
- Cost of production - *an economic or accounting indicator that refers to the costs incurred ... during a given time period to acquire and transform direct materials, so as to produce and sell revenue generating products, good and/or services* (SAFA, 2013c: 171).
- Price determination - the decision regarding the amount at which products and services can be sold (SAFA, 2013c: 174). This clearly has to be balanced between what the market will pay, what the products cost to be produced and what profit the enterprise wants or needs to make.

Objective C1.6: Balancing liabilities and assets

Obviously a major part of financial management is balancing the liabilities of an enterprise with its assets. That is balancing what an enterprise owns and what it owes.

Note that assets are also part of the 'create wealth' outcome and would be used again here to balance against liabilities.

Outcome C2: Vulnerability in minimised

The capacity of an enterprise to "*prevent, mitigate or cope with risk*" is maximised (SAFA, 2013b: 155) through securing the resilience of *production, supply and marketing in the face of environmental variability, economic volatility and social change* (SAFA, 2013a: 85), and managing well liquidity and risk.

According to SAFA (2013b: 155) "*vulnerability is the degree of exposure to risk (hazard, shock) and uncertainty, and the capacity of households or individuals to prevent, mitigate or cope with risk*". Even so, the SAFA rationale includes enterprises as well as households and individuals.

One of the major risks of a business enterprise is the stability of the context in which it operates. It is dependent on its supplies of the resource from which its product is produced, the stability of the market it supplies and the market conditions, and the supply and capability of its employees (see next section). An enterprise also has to manage its cash flow and have strategies in place to manage risk. Hence objectives of the 'vulnerability is minimised' outcome are: stability of production, supply and market, and manage liquidity and risk (Table 4.3).

Objective C2.1: Ensuring stability of production

The quantity and quality of production of an enterprise's products can be under threat from environmental, social and economic shocks (SAFA, 2013a: 85). There are two aspects to this. The first is to do with having mechanisms in place that guarantee the resilience of production levels and the second is to have a process in place to make an enterprise more resilient through producing a greater diversity of products by expanding its product range by modifying existing products, or adding new products.

Stability of production can be indicated by:

- Guarantee of production levels: *What are the actions and mechanisms that the enterprise has put in place to reduce the negative impact of the risks that could affect meeting the target volume of production and quality standards?* (SAFA, 2013a: 85).
- Product diversification - dependence on a single species or variety of crop, fish, tree, livestock; diversity of revenue sources.

Table 4.3: Objectives and indicators for the 'Vulnerability is minimised' (C2) outcome

| | Objectives | | Indicators | Indicators Description | Key Links |
|-------------|---|---------------|--|--|-------------|
| C2.1 | Ensuring stability of production | C2.1.1 | Guarantee of production levels | Mechanisms are in place to ensure that the quantity and quality of production is sufficiently resilient to withstand environmental, social and economic shocks. | SAFA |
| | | C2.1.2 | Product diversification | The process through which the enterprise diversifies or expands beyond its product range by modifying existing products, or adding new products. | SAFA |
| C2.2 | Ensuring stability of supply | C2.2.1 | Procurement channels | Procurement channels are the way an enterprise obtains its input supplies required to produce the product(s) to be sold in the market, or to offer services to clients. Ensuring that inputs, goods and services, are delivered on time, reduces vulnerability and risk exposure to suppliers that might affect reaching production levels, or delivering the type and quality of service offered., stability of supplier relationships, dependence on the leading supplier): Stable business relationships are maintained with a sufficient number of input suppliers, and alternative procurement channels are accessible. | SAFA |
| | | C2.2.2 | Stability of supplier relationships | Absence of excessive fluctuations in the linkages maintained with suppliers. | SAFA |
| | | C2.2.3 | Dependence on leading supplier | The weight or importance a supplier has in procuring the amount of required input supplies to the enterprise. | SAFA |

| | Objectives | | Indicators | Indicators Description | Key Links |
|------|------------------------------|--------|---------------------|--|-----------|
| C2.3 | Ensuring stability of market | C2.3.1 | Stability of market | Marketing channels are the ways products and goods are transferred to the next stage of the food chain and to the final consumer with the ultimate goal of guaranteeing that the goods are sold at an appropriate time and revenue is earned. Therefore, this includes having and implementing a marketing strategy. | SAFA |
| C2.4 | Managing liquidity | C2.4.1 | Cash-flow | The balance between cash inflow and cash outflow. This is a most critical measure as it indicates the enterprise's financial strength showing whether the liquidity level is sufficient to meet the financial commitments of the enterprise. | SAFA |
| | | C2.4.2 | Safety nets | The programmes, institutions, networks, social relationships, instruments and mechanisms that support the enterprise to withstand any individual or systemic shock. | SAFA |
| C2.5 | Managing risk | C2.5.1 | Risk management | Strategies are in place to manage and mitigate the internal and external risks (i.e. price, production, market, credit, workforce, social, environmental) that could negatively impact on the enterprise. | SAFA |

Objective C2.2: Ensuring stability of supply

The SAFA definition of the 'stability of supply' is that *"stable business relationships are maintained with a sufficient number of input suppliers, and alternative procurement channels are accessible"* (SAFA, 2013a: 85).

Indicators are:

- Procurement channels: the way an enterprise obtains its input supplies required to produce the product(s) to be sold in the market, or to offer services to clients. Ensuring that inputs, good and services, are delivered on time, reduces vulnerability and risk exposure to suppliers that might affect and enterprise reaching production levels, or delivering the type and quality of service offered. SAFA (2013a: 85) suggests measuring this by asking the question: *"Which actions and mechanisms have you put in place to reduce the risk [of] input supply shortages, including maintaining ongoing business relationships with suppliers?"*
- Stability of supplier relationships: the presence or absence of excessive fluctuations in the linkages maintained with suppliers. This could be related to past problems. SAFA (2013a: 85) suggests asking the question: *"What share of supplier contracts/business relationship has remained ongoing over the last 5 years?"*
- Dependence on the leading supplier: places importance on having multiple ways available to procure input supplies to the enterprise. SAFA (2013a: 85) suggests the question, *"What share of your inputs comes from the leading supplier?"* as a way of measuring this. Contractual arrangements could also be rated by duration, conditions, volume.

Objective C2.3: Ensuring stability of market

Marketing channels are the ways products and goods are transferred to the next stage of the food chain and to the final consumer with the ultimate goal of guaranteeing that the goods are sold at an appropriate time and revenue is earned. Therefore this includes an enterprise having and implementing a marketing strategy. SAFA is also concerned about the stability of the market for the products produced by an enterprise. This is expressed as: *"Stable business relationships are maintained with a sufficient number of buyers, income structure is diversified, and alternative marketing channels are accessible"* (SAFA, 2013a: 85).

The indicator 'stability of the market' could be measured by the dependence on the biggest source of income, say the percentage of the market share for five years. This may be irrelevant in the NZSD industry case studies, except at the highest level – such as ZESPRI. It is a measure of risk or vulnerability, but it could be of more interest to compare the change over five years. As part of market stability many businesses survey their customers to measure 'customer satisfaction' by measuring the percentage of satisfied customers out of total customers. It would be hoped that market share would be increasing or being maintained over the years.

Objective C2.3: Managing liquidity

An enterprise is also at risk when it does not have sufficient liquidity to pay for its costs in a timely way. *“Financial liquidity, access to credits and insurance (formal and informal) against economic, environmental and social risk [which] enable the enterprise to withstand shortfalls in payment”* (SAFA, 2013a: 85). Hence, managing liquidity is a component of financial sustainability.

Liquidity in a business means having sufficient cash available to meet commitments as they arise and ensure that over a year cash outflows are not greater than cash inflows. The higher the returns, the greater the level of debt a property or enterprise might carry. The KPI measurements in farm management for this are: change in working capital and cash surplus/deficit. Cash flow budgeting and comparing actual income and expenditure with that budgeted are the two most commonly used tools to maintain liquidity. The ratio of current assets to current liabilities is used to measure liquidity, as well as operating costs as a percentage of sales after purchases (Shadbolt and Gardner, 2005: 153).

Using the dairy sector as an example, *“the average dairy farm has increased its production of milk solids by 65 per cent over the last 10 years, while term liabilities have increased three-fold from \$0.9 million to \$2.8 million over the same period”* (DairyNZ, 2013a). Therefore, term liabilities have increased considerably faster than milk production for the average farm, increasing liquidity pressure on many farms.

Indicators

- Cash flow - the balance between cash inflow and cash outflow. This is most critical as it indicates the enterprise's financial strength showing whether the liquidity level is sufficient to meet the financial commitments of the enterprise. Cashflow turnover, the ability of an enterprise to generate cash from its sales, may be useful as a measure.
- Safety nets - the programmes, institutions, networks, social relationships, instruments and mechanisms that support the enterprise to withstand any individual or systemic shock.

Other variables that also measure vulnerability are:

- Existence of stocks of inputs, food etc. that are sufficient to withstand crop shortfalls and supply bottlenecks.
- Pasture as a percentage of feed consumed (dairy).
- Proximity to consumers (Saunders et al., 2007a).

Many other indicators mentioned elsewhere in this chapter also could be used as indicators of vulnerability and risk, such as:

- Employment - fluctuation rate of personnel (annual percentage of total personnel leaving the enterprise).
- Operating profit margin.
- Solvency – equity.
- Efficiency.

Objective C2.5: Managing risk

The NZSD and other such tools are concerned that an enterprise actively manages risk. Part of this is to have a risk management plan. According to SAFA (2013c: 192), *“A risk adaptation and mitigation plan is a structured set of actions and mechanisms to implement to prevent, manage and reduce the extent to which the enterprise is exposed to internal and external risk(s), its (Their) likelihood of occurrence, and to minimise its (their) possible negative impact”*. The risks that an enterprise faces include *“price, production, market and credit risk, unstable employment relations, unavailability of workforce, conflicts with the community and other stakeholders, natural disasters, disease and climate change”* (SAFA 2013c: 192). There are external and internal risks.

Indicators

- Risk management – the strategies are in place to manage and mitigate the internal and external risks that could negatively impact on the enterprise.

An example of a measurement of risk that is commonly used is the debt to equity ratio (risk ratio or leverage ratio), which shows the proportion of a company's activities that are funded by debt or equity.²⁵

Outcome C3: Product quality and information is enhanced

Any contamination of produce with potentially harmful substances is avoided, and nutritional quality and traceability of all produce are clearly stated.

According to SAFA (2013a: 86), *“all people have the right to expect the products they consume, in particular their food, to be safe and suitable for consumption (FAO/WHO, 2003)”*. Similarly, *“producers, processors, retailers and consumers have the right to be informed by their suppliers about all the attributes of a product relevant for its utilization”*.

Product quality is defined as *“the totality of features and characteristics of a product that bear on its ability to satisfy stated or implied needs”* (ISO as quoted in SAFA, 2013a: 86). As product safety in New Zealand is covered by legislation it has been placed in the Good Governance dimension of the NZSD. Legislation covers compliance with indicators to do with:

- Product information.
- Traceability.
- Food safety.
- Food quality - quality management.

²⁵ A low ratio of about 0.30 is generally considered good, 2 is considered “worrisome”. See <http://www.wikihow.com/Analyze-Debt-to-Equity-Ratio>

- Membership of certification schemes.

Food quality can also have quantitative measures to do with:

- Quality grades of products.
- Productivity.
- Waste.
- Returns as a proportion of total sales or total productivity.

The NZSD has the objectives manage food safety, enhance food quality and provide reliable product information with the expectation that these objectives will achieve the outcome of enhancing product quality and information provided with those products (Table 4.4).

Objective C3.1: Managing food safety

Food safety is well managed when “*food hazards are systematically controlled and any contamination of food with potentially harmful substances is avoided*” (SAFA, 2013b: 166). For an enterprise to manage the safety of the products they produce they need to account for how they will control the possibilities for food contamination throughout their production and delivery chain and how successful these controls have been.

Indicators are:

- Control measures - actions taken to reduce chance of exposure to food hazards.
- Hazardous pesticides - highly hazardous pesticides should be avoided in all the stages of the production, storage, processing, transport and distribution of an enterprise's products.
- Food contamination - cases in which adulteration of food has been reported due to negligence, accident or involuntary misconduct.

Objective C3.2: Enhancing food quality

Similarly an enterprise is expected to meet certain standards of quality for its products. SAFA (2013b: 168) defines it more explicitly as: “*the quality of food products meets the highest nutritional standards applicable to the respective type of product*”. Hence, the usual indicators are associated with compliance with these standards and an enterprise hopefully achieves even higher standards than those required.

Indicator

- Compliance with quality standards - the set of rules defined to guarantee product quality (and to meet the highest nutritional standards respective to the type of product).

Table 4.4: Objectives and indicators of 'Product quality and information is enhanced' (C3) outcome

| | Objectives | | Indicators | Indicators Description | Key Links |
|------|--|--------|--------------------------------|---|--|
| C3.1 | Managing food safety | C3.1.1 | Control measures | Actions taken to reduce chance of exposure to food hazards. | SAFA, GRI (G4) Saunders et al. (2007d) RISE (2011) |
| | | C3.1.2 | Hazardous pesticides | Highly hazardous pesticides should be avoided in all the stages of the production, storage, processing, transport and distribution of an enterprise's products. | SAFA, GRI (G4) Saunders et al. (2007d) RISE (2011) |
| | | C3.1.3 | Food contamination | Cases in which adulteration of food has been reported due to negligence, accident or involuntary misconduct. | SAFA, GRI (G4) Saunders et al. (2007d) RISE (2011) |
| C3.2 | Enhancing food quality | C3.2.1 | Compliance (quality standards) | The set of rules defined to guarantee product quality (and to meet the highest nutritional standards respective to the type of product). | SAFA, GRI (G4) Saunders et al. (2007d) RISE (2011) |
| C3.3 | Providing reliable product information | C3.3.1 | Product labelling | An essential part of transparent accountability to consumers. Labels must be clear, honest and verifiable. Labelling standards are often subject to regulation. | SAFA, GRI (G4) Saunders et al. (2007d) RISE (2011) |
| | | C3.3.2 | Traceability | A series of mechanisms and procedures that ensure traceability over all stages of the food chain, so that products can be easily identified and recalled. | SAFA, GRI (G4) Saunders et al. (2007d) RISE (2011) |

Objective C3.3: Providing reliable product information

Any products produced by an enterprise should have labels that provide consumers with trustworthy information about qualities of the product and assurance of its traceability across the production and supply chain.

Indicators

- Product labelling - an essential part of transparent accountability to consumers. Labels must be clear, honest and verifiable. Labelling standards are often subject to regulation.
- Traceability - a series of mechanisms and procedures ensuring traceability over all stages of the food chain, so products can be easily identified and recalled.

Outcome C4: Contributed to creating value in local economy

Through production, employment, procurement, marketing and investments in infrastructure, the enterprise contributes to sustainable local value creation. It can do this employing local people whose pay will then promote greater business activity where they live, and by sourcing as much of its raw products and things required in their production within the local community as is economically feasible. By paying such things as taxes and rates and enterprise also contributes to the local economy where these monies will be spent.

The objectives which aim to achieve this are enhance local economy and invest in the community (Table 4.5).

Objective C4.1: Enhancing local economy

An enterprise can enhance the local economy by contributing to local economic development (SAFA, 2013b: 172).

There has been an increasing emphasis on procurement practices in the recent history of sustainability measurement with a growing concern about the need for businesses to support both the local communities of which they are part and the nation as a whole. This may well be part of an international push to 'buy local'. SAFA, for example, has decided to use a micro-economic approach "that focuses on the enterprise and the local community resilience" rather than "the macro-economic issue of growth rates" (SAFA, 2013a: 57). The most recent versions of the SAFA (2013b) and GRI (G4) (2013a, b) guidelines have given greater prominence to this aspect of sustainability than they had in their previous versions (FAO, 2012a; GRI, 2011a, 2006). A report, 'Procurement matters: the economic impact of local suppliers', compares two companies which circulate 19 per cent and 12 per cent respectively, of their revenue in the local economy, with the result that the first company had a 64 per cent greater local impact than the other.²⁶

²⁶ Retrieved from:

www.civiceconomics.com/app/download/.../Procurement+Matters.pdf

Table 4.5: Objectives and indicators for the 'Contributed to creating value in local economy' (C4) outcome

| | Objectives | | Indicators | Indicators Description | Key Links |
|------|-------------------------|--------|------------------------------------|--|---|
| C4.1 | Enhancing local economy | C4.1.1 | Procurement practices | The existence and practice of a policy that prioritizes the purchase of inputs, products and ingredients from local suppliers where local suppliers can provide the required inputs. | SAFA, Sustainable Agriculture Standard, FSC |
| | | C4.1.2 | Regional workforce | An enterprise benefits local economies through local employment. | SAFA, Sustainable Agriculture Standard, FSC |
| C4.2 | Investing in community | C4.2.1 | Fiscal commitment to local economy | An enterprise contributes to the sustainability of local economies through carrying out its obligations to pay taxes – both national and local. | SAFA |

However, this seems a double-edged sword for sectors that are likely to use the NZSD, as New Zealand relies so heavily on exporting. Therefore, before local procurement is agreed upon there would need to be an analysis of comparative costs of procurement between local suppliers and others for input sourcing.

Indicators

- Procurement practices – which could be measured by finding the expenditure on local supplies at significant locations of operations (GRI, 2013a, b). When procurement is mentioned as an indicator an enterprise's needs to supply geographical definitions for 'local' and for 'significant locations of operation'. Such definitions could be standardised in some way for a New Zealand context. SAFA, on the other hand, suggests a compliance measure: Has *"the enterprise purchased its inputs/ingredients/products from local suppliers when equal or similar conditions exist in comparison to non-local suppliers"* (SAFA 2013a: 299)? This could be more applicable to the NZ situation described above. In other words, this way of articulating the measure requires the existence and practice of a policy that *"prioritizes the purchase of inputs, products and ingredients from local suppliers ... where local suppliers can provide the required inputs ..."* (SAFA 2013a: 299).
- Regional workforce – enterprises benefit local economies through local employment.

Enhancing the local economy may be an aspirational goal or it may be something primary industries do anyway and so it could be a good point for them to emphasise.

Rather than having quantitative measures related to the involvement of an enterprise in the community in which it operates, there may be associated policies that are checked for compliance, such as:

- Local community involvement/development - the enterprise must have policies and procedures for prioritizing the hiring and training of a local labour force and for contracting and acquiring local services and products.

Objective C4.2: Investing in community

An enterprises contributes to the sustainability of local economies through carrying out its obligation to pay taxes – both national and local (through rates, for example). This can be seen as satisfying a fiscal commitment and responsibility to the community in which an enterprise operates. Earlier in this chapter, an enterprise's investment in the community was also described in other more direct ways.

Indicator

- Fiscal commitment to local economy - through its payment of taxes the enterprise contributes to the sustainable development of a community.

Outcome C5: Production is efficient

Production efficiency measures whether the economy is producing as much as possible without wasting precious resources ... Because resources are limited, being able to make products efficiently allows for higher levels of production. If the economy can't make more of a good without sacrificing the production of another, then a maximum level of production has been reached.²⁷

Production can be defined as the processes and methods used to transform tangible inputs (raw materials, semi-finished goods, subassemblies) and intangible inputs (ideas, information, knowledge) into goods or services. Resources are used in this process to create an output that is suitable for use or has exchange value.²⁸

The 'production is efficient' outcome has the objectives 'enhancing production' and 'enhancing productivity' (Table 4.6).

Objective C5.1: Enhancing production

In the primary production sector a performance indicator is “a measure of physical and/or financial whole farm or individual enterprise performance. Physical performance indicators usually relate to production outcomes or yields, or physical inputs. Physical scale and performance, for example, total areas, grazed area, cropped area, improved pasture area, stocking rate and rainfall, are clearly focused on the production system and may not provide much information on the longer-term farm sustainability” (Wilson et al., 2005). However, they are important as they provide context on the scale of the operation and the biophysical resources (climate, contour, location, physical characteristics of the soil and altitude) (Martin et al., 2005: 11) and such resources will need to be accounted for as context variables in the NZSD.

Indicator

- Production - physical outputs / production volumes.

Objective C5.2: Enhancing productivity

“Productivity is defined as the output of valued product per unit of resource input either in physical or monetary terms” (Kelly and Bywater 2005: 69). The Oxford dictionary²⁹ defines productivity as the “effectiveness of productive effort, especially in industry, as measured in terms of the rate of output per unit of input”. In other words, productivity is a measure of physical farm efficiency or how well a business converts input resources into production and could be described by the equation:

Productivity = physical outputs (production) - physical Inputs (resources used)
(DairyNZ Economic Survey, 2011-12: 15).

²⁷ http://www.investopedia.com/terms/p/production_efficiency.asp

²⁸ <http://www.businessdictionary.com/definition/production.html>

²⁹ <http://oxforddictionaries.com/definition/english/productivity>

Table 4.6: Objectives and indicators for the 'Production is efficient' (C5) outcome

| | Objectives | | Indicators | Indicators Description | Key Links |
|------|------------------------|--------|----------------------|--|------------------------------------|
| C5.1 | Enhancing production | C5.1.1 | Production | Physical outputs / production volumes | MPI, Dairy NZ |
| C5.2 | Enhancing productivity | C5.2.1 | Labour productivity | The output of valued product per unit of labour input. | MPI, DairyNZ Shadbolt & Bywater |
| | | C5.2.2 | Capital productivity | The output of valued product per unit of capital. | MPI, Dairy NZ |

Resource input can include land, irrigation, fertiliser, agrichemicals, labour, fuel and infrastructure. As examples, measures of productivity indicators³⁰ include: litres of wine per labour unit, or kilograms of milk solids (MS) per kilogram of nitrogen fertiliser, farm/orchard input costs as a percentage of farm/orchard income, economic output per cumec irrigation water input and labour productivity (cows/trays/litres per FTE or farm income/FTE). For vineyards, labour is the most significant expense, accounting for 53% of expenses in the MPI Marlborough vineyard model budget and other significant costs include weed/pest control and energy costs (MPI, 2012).

Production economics introduces the 'marginal principle' meaning 'additional or incremental' and is used to analyse farm management decisions. It states that *"when looking at a change to a farm system, one should consider the marginal cost associated with the change along with the marginal benefits"* (Shadbolt and Bywater, 2005: 31). When analysing productivity indicators and their trends over time or benchmarking against others, it may be possible to identify diminishing returns for increased inputs. For example, increased use of supplementary feed or irrigation use may show progressively smaller gains in milk production. *"The marginal concept is central to farm management decision making"* (Shadbolt and Bywater, 2005: 31).

Again using the dairy industry as an example, for many years, it focused on increased production rather than productivity. This means that although the amount of product produced increased, the resource input to produce that product also increased. In the decade ending June 2012, milk production per hectare on the average New Zealand owner-operator dairy farm increased 18 per cent. However, the extra production came from increases in inputs such as capital (cows and infrastructure), and farm working inputs (feed, fertiliser, overheads etc.). Over the last decade, outputs increased 6.3 per cent, while inputs increased 6.5 per cent. Overall, there has been no net change in total productivity over the last ten years and it has eroded farm profitability (DairyNZ, 2013a). This is visually demonstrated by graphing productivity indicators (Figure 4.2).

Indicators

- Labour productivity – production per labour input
- Capital productivity –production per capital input.

³⁰ Most productivity indicators are actually production measures not productivity indicators. Productivity is a more sustainable concept than production.

Dairy Farm Output, Input and Productivity Movements

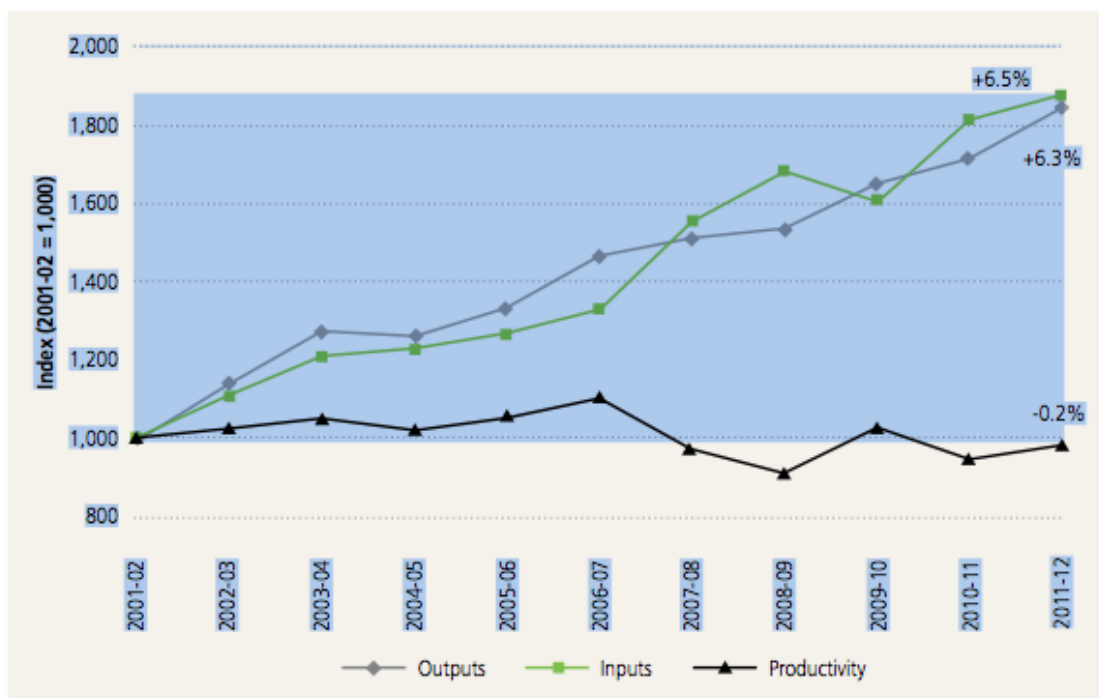


Figure 4.2: Dairy farm output, input and productivity movements

Source: DairyNZ Economic Survey 2011-12 (DairyNZ, 2013a)

Conclusion

Indicators associated with economic resilience that should be used in the NZSD fall into two broad categories – those that provide context and those that will lead to measures of sustainability. In the latter group there is a division between those indicators that measure compliance with audit schemes, policies, regulations etc. and indicators that have measures that go beyond compliance. In the second group, the indicators can be further grouped to focus on different areas of economic resilience.

The most basic group is that of indicators which consist of financial data to do with the economic value generated by products produced by an enterprise, the costs and expenses associated with that production and the profit made. (The NZSD should only need to collect two of these indicators to calculate the other one.) Each of these indicators can be calculated in different ways to suit the industry or sector developing its own NZSD. Another basic financial sustainability indicator is the enterprise's efficiency which can also be calculated in many ways. Outside this basic financial data there are other financial variables that are of interest to management, shareholders and the market in general. Indicators that arise from an examination of different expenditure items can also be of interest and worthy of investigation if an enterprise wished to further examine its sustainability.

Other groupings of indicators relate to economic resilience beyond the collection of basic financial data. These groupings are practices related to:

- Procurement – management of the input resources
- Investment including investment in innovation – management of the profit resource
- Risk or vulnerability – management of threats to the enterprise
- Employment – management of employees as a resource.
- Compliance with regulations and policies associated with working conditions, product safety and quality, business planning and community engagement.

The indicators described in this chapter fit quite readily into a framework (Table 4.1) which is slightly amended from the SAFA (2013b) framework (**Error! Reference source not found.**2.4), now including two new outcomes - 'Financial well-being is maintained' (which actually incorporates some of the original SAFA theme of 'Investment') and 'Production is efficient'. Both of these outcomes are widely used in existing New Zealand frameworks.

Chapter 5: Measuring to secure agro-environmental integrity in New Zealand

Agro-environmental integrity - Sustains natural capital, enhances natural heritage values and meets global environmental obligations.

Agro-environmental integrity is defined as the state which sustains the full potential of land and its natural capital, ecosystem processes and services to efficiently and indefinitely produce healthy, high quality food and fibre while enhancing natural heritage values and meeting global environmental change obligations.

Agro-environmental integrity: a national outcome for New Zealand's production lands

The first step in developing an effective environmental monitoring design is to clearly define the goals and vision of the framework in order to identify and target the priority components (Yoccoz et al., 2001; Jones et al., 2013a). New Zealand currently lacks environmental goals for production landscapes. Hence we begin by briefly reviewing the special features of New Zealand's ecology and agriculture in order to define an appropriate concept of 'agro-environmental integrity' (MacLeod and Moller, 2013).

Meeting the needs of New Zealand's agro-ecosystems

Definitions for agro-environmental integrity, and the design of a monitoring framework to attain it, must be locally relevant if they are to be used to inspire and assess local environmental care. This means that the target outcomes, objectives and indicators should closely match local ecological, social and economic risks and benefits while simultaneously meeting international opportunities and threats.³¹

Several special features of New Zealand ecology should be considered, particularly the need to:

- safeguard threatened indigenous species
- control introduced small mammals for reducing disease risk and conservation of native biota
- maintain biosecurity for production and conservation systems
- enrich for agriculture relatively new soils derived recently from forests
- prevent erosion

³¹ See Moller and MacLeod (2013) for a discussion of the value of mapping these links to Responses, Pressures, State and Benefits (RPSB) models.

- restore indigenous habitat (especially rare ecosystems, wetlands and woody vegetation)
- manage keystone introduced species that provide ecosystem services
- build motivation and capacity for implementing environmental care amongst farmers, industry and communities, especially in low-lying fertile landscapes.

In addition, special features of New Zealand's society and economy need to be recognised if these ecological challenges and opportunities are to be achieved, especially the:

- highly intensive form of agriculture that is already very efficient
- reliance on imports of large quantities of 'ecological subsidies' (fertilisers, supplementary feeds, cheap energy sources)
- overt subsidisation or payment for ecosystem services from public funds
- little regulation of what happens (or doesn't happen) on private land
- inclusion of Māori dimensions of sustainable land management governance, goals and knowledge.

Ecological integrity within natural ecosystems

Recognition of the distinctive and important indigenous biodiversity in New Zealand has a long history and the goals for its protection were most recently articulated in the New Zealand Biodiversity Strategy. In an attempt to operationalise these goals, Lee et al. (2005) used the concept of 'ecological integrity', which requires that the *'full potential of indigenous biotic and abiotic features and natural processes are functioning in sustainable communities, habitats, and landscapes'*. It encompasses all levels and components of biodiversity, and enable assessment at multiple scales, up to and including the whole of New Zealand. At larger scales, ecological integrity will be achieved *'when all the indigenous organisms (native plants, animals, fungi, etc.) typical of a region are present, together with the key processes that sustain functional relationships between all these components, across all of the ecosystems represented in New Zealand'* (Lee et al. 2005).

The 'ecological integrity' concept is the basis for a nationally coordinated system currently being developed and implemented for biodiversity monitoring and reporting by the Department of Conservation and the regional councils (Lee et al., 2005; Allen et al., 2009; Lee and Allen, 2011; MacLeod et al., 2012a, c; MacLeod and Moller, 2013). The close alignment of the NZSD to this local system is valuable because it will facilitate cross-scale linkages and integrated management throughout New Zealand. It also provides an opportunity for the NZSD to better support national environmental policy, state of environment reporting and coordinated advocacy for sustainable land management.

Integration to achieve agro-environmental integrity within production landscapes

Ecological integrity is deconstructed into three primary components – environmental representation, species occupancy and indigenous dominance, to allow for the complex character of biodiversity. It is defined as a goal mainly for 'natural' or 'semi-natural' environments on public

conservation land (Lee et al., 2005)³² and as such, it is not directly and wholly transferable to guide an environmental monitoring framework for New Zealand's production landscapes where introduced species (e.g., grass and fodder crops, fruit, grapes, cattle and sheep) underpin primary production of food and fibre. Nevertheless, if production landscapes are going to contribute to conserving and restoring New Zealand's heritage at local, regional, national and global levels, many of the elements of ecological integrity promoted (Lee et al., 2005) must be integrated with delivery of 'provisioning services' (see Moller and MacLeod, 2013, Box 3).

The need for integrating environmental care with efficient and productive agriculture has been well recognised in New Zealand for decades in both international and national policy instruments (Table 2.5). For example, key targets of the Convention on Biological Diversity (2011) include: *"improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity"* and *"areas under agriculture ... are to be managed sustainably, ensuring conservation of biodiversity"*. Similarly, the New Zealand Biodiversity Strategy (2000) states a need for New Zealand to *"sustain the more modified ecosystems in production and urban environment"* (MfE and DOC, 2000).

Our framework is designed to align with the Sustainability Assessment of Food and Agriculture systems (SAFA) protocols launched by the United Nations' Food & Agriculture Organisation (FAO, 2012a). The SAFA framework is the most comprehensive, practical and flexible of the 14 international frameworks and sustainability tools that we reviewed for the environmental pillar (Table 2.5) to ensure that the NZSD framework and indicators complement and match international aspirations (Moller and MacLeod, 2013). The SAFA protocols collect most of the environmental components of sustainable food and fibre production under an 'Environmental Integrity' dimension (FAO, 2012). There is no formal definition of the 'integrity' of ecosystems in the SAFA (2013b) context, but it focuses on biophysical elements of agro-ecosystems and the continuance of ecological flows between them.³³ The water and biodiversity themes are the main intersections with New Zealand's ecological integrity concept, but most of SAFA's monitoring is directed towards the provisioning, regulating and supporting components of ecosystems services, and thereby primarily underwriting human needs and values. Natural ecosystems and protection of threatened species are included in most food and fibre production standards (UNEP-WCMC, 2011). However, there is relatively little attention to restoration or protection of highly modified fragments or restoration within production landscapes and none of agricultural standards that prevent habitat conversion for agriculture.

³² Lee et al. (2005: 99) emphasised that biodiversity on private land was increasingly important, but that their framework "at certain levels has been designed specifically to meet DOC's requirements as derived from the Statement of Intent".

³³ We speculate that the word 'integrity' has been incorporated by SAFA (2013b) partly because of its resonance with the values and ethical imperatives for farmers, foresters and fishers to behave kindly to the environment. The wider context of the whole SAFA programme aims to define and monitor their actions, so the primary focus is on linkages between governance, social, economic and ecological dimensions.

An additional focus on agro-biodiversity, including common and introduced biota

Much of the thrust of the Convention on Biological Diversity (CBD) stemmed from 'Agenda 21', a policy statement upheld by the 1992 Rio Conference. Chapter 14 of Agenda 21 concerns Agricultural Biodiversity, which it defines as:

"...the variability among living organisms associated with cultivating crops and rearing animals and the ecological complexes of which they are part; this includes diversity within species, between species, and of ecosystems. The unique feature of agricultural biological diversity is the emphasis on its utility to human beings" (UNEP/CBD/COP/3/14, 1996: 2).

Introduced plants and animals provide most of the food and fibre produced by New Zealand's agriculture, and key services to keep the ecosystem functioning (e.g., honey bees for crop pollination and earthworms for soil quality and function). As agro-environmental integrity must include care for a whole suite of animals and plants not normally considered in ecological integrity, the NZSD will monitor and guide management of introduced biodiversity for its own sake, and will not have a goal to reduce 'exotic dominance' in the landscape as a whole. The NZSD also recognises that New Zealand's agro-ecosystems may be contingent on the retention of both introduced and indigenous species on production lands (MfE and DOC, 2000; Moller et al., 2008a). Today's seemingly redundant species may be tomorrow's agricultural biodiversity, and affect the abundance of agricultural biodiversity through a myriad of 'indirect ecological interactions' within the food web (Yodzis, 1988), and contribute to important ecological flows among reserves, the surrounding matrix of production land, margins of production landscapes and large reserves in national parks.

Land-sparing and land-sharing: integrating biodiversity conservation and agriculture

The need for better integration of production and conservation outcomes was highlighted by New Zealand's Biodiversity Strategy. Two major strategies are promulgated to combat agricultural impacts on biodiversity: 'land-sparing' and 'land-sharing' (Green et al., 2005; Fischer et al., 2008; Phalan et al., 2011; Balmford et al., 2012).

Land-sparing is based on the presumption that by intensively developing some areas, other areas can be spared from any development and biota sustained within those reserved areas (Rowarth 2008; Didham et al. 2012; Lindenmayer et al. 2012). New Zealand has already developed most of the fertile lowland areas and hence, at a national and even a landscape scale, remaining land available for agricultural development is predominantly marginal land and is already well represented in public conservation lands (Craig et al., 2013).

Conversely, land-sharing suggests that sympathetic land management (also called wildlife-friendly farming) can result in high biodiversity in ecosystems that are also tuned to efficient and intensive production; this approach is widely advocated for and applied in international

environmental certification schemes. Land-sharing is obviously the main strategy left for New Zealand at a broad scale now that most of the indigenous forest ecosystems have been removed to make way for farming (Meadows et al., 2008; Moller et al., 2008a, b; Norton and Reid, 2013). It is also a matter of practical reality that New Zealand's Resource Management Act severely constrains removal of large tracts of indigenous vegetation, so the predominating philosophy for New Zealand farmers and conservation advocates must now be land-sharing or restoration of unfarmed habitats back into the production landscapes.

The NZSD design and emphasis sits squarely on the premise that both land-sharing and land-sparing will be needed within farm boundaries if intensive agriculture is to be ecologically sustainable in New Zealand. This will require a matrix of ecological refuges and production spaces that function collectively to support agro-ecosystems and natural habitats at landscape levels. Indicators should target land cover and connectivity metrics within farms to track progress and consequences for all sustainability indicators (including production, profit, animal welfare and biodiversity) but not neglect to measure biodiversity, especially but not exclusively agro-biodiversity, within the production spaces of the farms as well.

Agricultural intensification: a mounting threat to agro-ecosystem integrity?

Recent reviews have highlighted an accelerating rate of agricultural intensification in New Zealand that may threaten both the environment and the sustainability of food production (PCE, 2004; MacLeod and Moller, 2006). Understanding the associated extent and nature of environmental impacts is one of the most pressing issues facing New Zealand's public, agricultural sectors, government agencies and conservation scientists. Although farming in New Zealand is based on introduced species, it still relies on the services provided by natural capital, which it can also impact, to sustain production: *"Agricultural activities can generate a range of environmental benefits. These include aesthetic value, recreation, water accumulation and supply, nutrient recycling and fixation, soil formation, wildlife protection and flood control, and carbon sequestration by trees and soil. However, major changes in farming practices in the past forty years have brought new pressures to bear on natural resources"* (PCE, 2004 quoting OECD).

Definition of agro-environmental integrity

We propose that the following definition of agro-environmental integrity as the overarching outcome of environmental monitoring within the NZSDs:

Agro-environmental integrity is defined as the state which sustains the full potential of land and its natural capital, ecosystem processes and services to efficiently and indefinitely produce healthy, high quality food and fibre while enhancing natural heritage values and meeting global environmental change obligations.

It recognises the need for an integrated management approach implemented across multiple spatial scales and governance jurisdictions to maintain livelihoods, social well-being and restore

ecological integrity in New Zealand. The NZSD 'agro-environmental integrity' framework will, therefore, be structured around achieving four outcomes (Fig. 5.1; MacLeod and Moller, 2013):

- Natural capital of production landscapes is maintained
- Resilience of New Zealand agriculture is secured for future productive use
- Production landscapes contribute to national 'natural heritage' goals
- New Zealand meets global environmental change obligations.

Environmental outcomes for the NZSD

Four environmental outcomes in the NZSD will result from achieving 10 objectives. Twenty indicators will be used to monitor progress towards those objectives (Fig. 5.1; MacLeod and Moller, 2013), some of which may be supported by multiple measures. All the indicators included in the framework are important for agro-environmental integrity and driving sustainable practice. However, we recognise that implementation must be phased depending on what is required to obtain the necessary information and industry priorities (MacLeod and Moller, 2013).

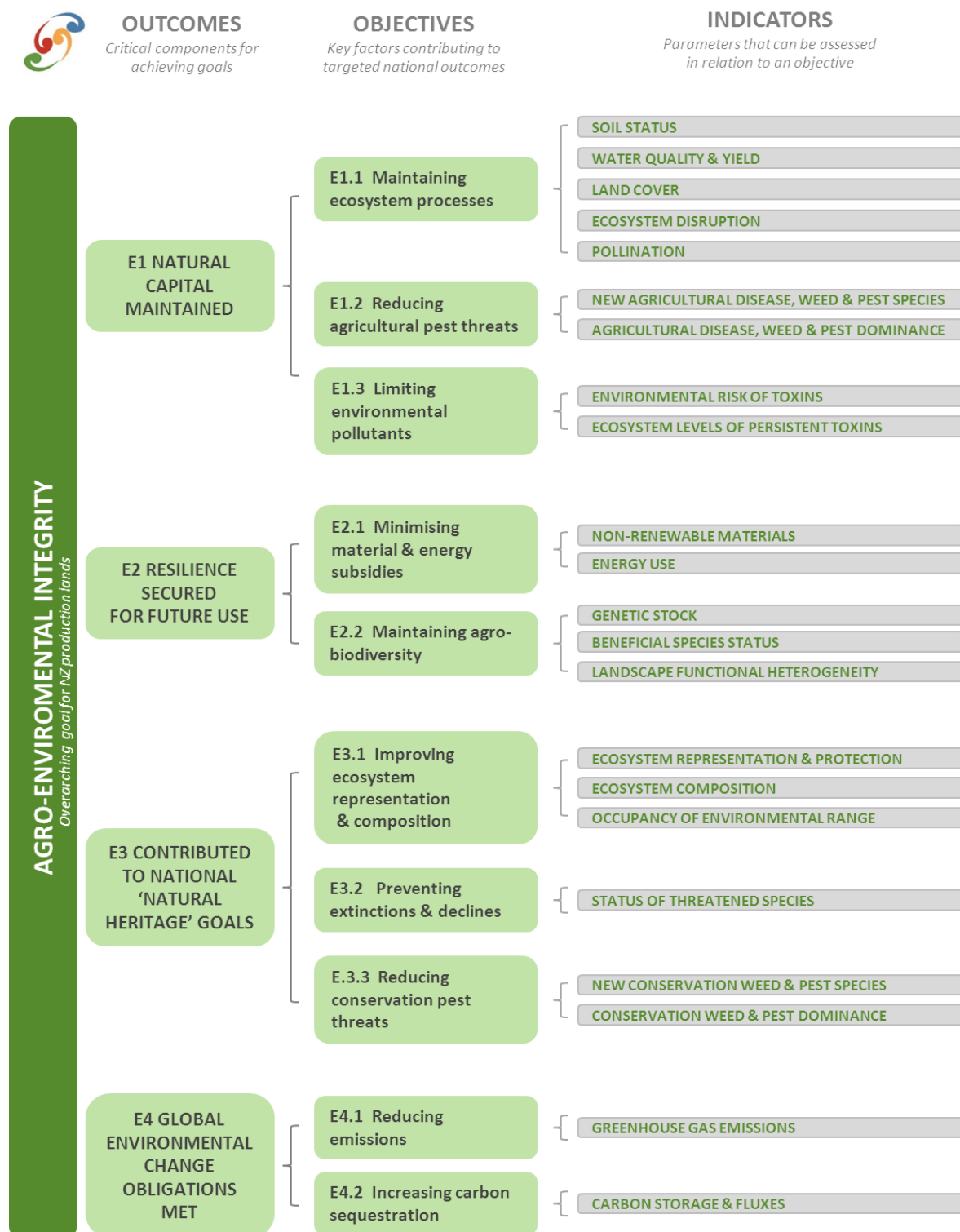


Figure 5.1: Environmental monitoring framework proposed for sustainable land management in New Zealand's production landscapes

Table 5.1: NZSD agro-environmental integrity detailed outcomes and objectives

| Outcomes | | Objectives | | Indicators | |
|----------|---|------------|--|------------|---|
| Nb | Critical components for achieving goals | Nb | Key Factors contributing to Outcomes | Nb | Parameters that can be addressed |
| E1 | Natural capital for production is sustained | E1.1 | Maintaining ecosystem processes | E1.1.1 | Soil status |
| | | | | E1.1.2 | Water quality and yield |
| | | | | E1.1.3 | Landcover |
| | | | | E1.1.4 | Ecosystem disruption |
| | | | | E1.1.5 | Pollination |
| | | E1.2 | Reducing agricultural pest threats | E1.2.1 | New agricultural weed and pest species |
| | | | | E1.2.2 | Agricultural disease, weed and pest dominance |
| | | E1.3 | Limiting environmental pollutants | E1.3.1 | Environmental risk of toxins |
| | | | | E1.3.2 | Ecosystem levels of persistent toxins |
| E2 | Resilience is secured for future use | E2.1 | Minimising material and energy subsidies | E2.1.1 | Non-renewable resources |
| | | | | E2.1.2 | Energy use |
| | | E2.2 | Maintaining agro-biodiversity | E2.2.1 | Genetic stock |
| | | | | E2.2.2 | Beneficial species |
| | | | | E2.2.3 | Landscape functional heterogeneity |

| | | | | | | |
|----|---|---|------|--|--------|---|
| E3 | 'Enhanced natural heritage' goal supported | Maintain ecosystem representation and composition, prevent extinctions and declines, and reduce conservation pest threats | E3.1 | Maintaining ecosystem representation & composition | E3.1.1 | Ecosystem representation & protection |
| | | | | | E3.1.2 | Ecosystem composition |
| | | | | | E3.1.3 | Occupancy of environmental range |
| | | | E3.2 | Preventing extinctions & declines | E3.2.1 | Status of threatened species |
| | | | E3.3 | Reducing conservation pest threats | E3.3.1 | New environmental weed and pest species |
| | | | | | E3.3.2 | Environmental weed and pest dominance |
| E4 | Global environmental change obligations met | Reduce emissions and increase carbon sequestration | E4.1 | Reducing emissions | E4.1.1 | Greenhouse gas emissions |
| | | | E4.2 | Increasing carbon sequestration | E4.1.2 | Carbon storage and fluxes |

Outcome E1: Natural capital for production is maintained

This outcome (E1) focuses on sustaining natural capital for production, while also recognising its importance for maintaining livelihoods and ecological components associated with New Zealand's agro-ecosystem. It addresses three key objectives: (1) maintaining ecosystem processes, (2) reducing agricultural pest threats and (3) limiting environmental pollutants within New Zealand's agro-ecosystems (Table 5.2).

Natural capital is considered essential to the sustainability of intensive farming in New Zealand (PCE 2004), with capital-based indicators recently being proposed as a potential means for measuring agricultural sustainability (Saunders et al., 2010). Natural capital stock takes different identifiable forms (e.g., trees, minerals, ecosystems or atmosphere) or intangible forms (e.g., stored in species or ecosystems; Costanza et al., 1997; PCE, 2004). Ecosystem services consist of flows of materials, energy and information from natural capital stocks which combine with manufactured and human capital services to produce human welfare (see Box 3 in Moller and MacLeod, 2013). The human use of this flow of services may or may not leave the original capital stock intact. At a global level, the Millennium Ecosystem Assessment highlighted that over 60% of ecosystem services were deteriorating or already overused (MEA, 2005). A number of global initiatives have recently been established to support monitoring and management of natural capital and ecosystem services at different spatial scales (e.g., MEA, 2005; TEEB, 2010; Tallis et al., 2012).

Objective E1.1: Maintaining ecosystem processes

Maintaining ecosystem processes is a key factor contributing to the natural capital outcome (E1). This means maintaining the stocks and/or flows of materials (natural capital) in an ecosystem, resulting from interactions among organisms and with their physical-chemical environment (Mace et al., 2012). Ecosystem processes change and have their own characteristic rates and tipping points when thresholds are exceeded. As the physical, chemical and biological features and components of ecosystems change, so will the processes and, consequently, the ecosystem services. The complexity of these interactions is poorly understood, making it difficult to predict how they will change in response to changes in stressors such as agricultural intensification and climate change.

Five indicators are recommended for determining whether ecosystem processes in New Zealand's agro-ecosystems are being maintained (Table 5.2): (1) Soil provides the 'central engine room' for New Zealand agriculture and is a driver of land use decisions (PCE, 2004; Statistics NZ, 2009). (2) Fresh water is among New Zealand's most valuable assets and is a vital part of the country's economy (Statistics NZ et al., 2013); the impact and dependence of agricultural production on this resource is also one of New Zealand's most important environmental concerns. (3) Monitoring and understanding New Zealand's land cover and use patterns in agricultural landscapes is important for determining the drivers of change and whether production, natural and cultural components are being maintained (Statistics NZ et al., 2013). (4)

Extreme disturbance events (e.g., disease, drought) can adversely impact production either directly (e.g., resulting in crop loss) or indirectly (e.g., increasing reliance on supplementary animal feed); ecosystems play an important role in modulating the effects of such events (MEA, 2005). (5) Maintenance of pollination processes is crucial for crop production in some sectors, hence global declines in pollinator species are a major concern for agro-ecosystems (Power, 2010; Garibaldi et al., 2013; Tylianakis, 2013).

Objective E1.2: Reducing agricultural pest threats

Reducing agricultural pest threats is another key factor contributing to the natural capital outcome (E1). Agro-ecosystems are increasingly recognised as both sources and sinks of disease, weed and animal pest species, which can have significant effects on agricultural biosecurity, biodiversity, global economies, and human health. Changes in the emergence, prevalence and abundance of such pests are driven largely by socioeconomic, environmental, and ecological factors (Blaustein and Johnson, 2010).

Zoonotic disease emergence at the wildlife–livestock–human interface, for example, is often associated with varying combinations of agricultural intensification and environmental change (Jones et al., 2013b). Some introduced species have become reservoirs for disease in livestock and humans. In New Zealand, for example, tuberculosis in cattle and deer is an on-going endemic disease issue requiring significant investment in wildlife reservoir control to manage (Ryan et al., 2006). Other wildlife species impact agricultural production (Porter et al., 1994), with native and introduced birds, for example, causing significant damage to grape crops in vineyards (Boyce et al., 1999; Kross et al., 2011).

Two indicators for monitoring threats posed by agricultural pests are recommended (Table 5.2). One focuses on detecting and managing new pest threats, thus meeting the regulatory requirements set out in the Hazardous Substance and New Organisms Act 1996³⁴. The other assesses changes in the dominance of established agricultural pests posing a risk to agricultural production and the wider environment.

³⁴ <http://www.legislation.govt.nz/act/public/1996/0030/latest/DLM381222.html>

Table 5.2: Objectives and indicators for the natural capital outcome (E1), specifying the indicator definition, the percentage of reviewed schemes that monitored similar indicators and key international (SAFA) and local (BMRS and TBMF) frameworks (MacLeod and Moller, 2013).

| Objectives | | Indicators | | Indicators Description | Reviewed schemes | Key links |
|------------|------------------------------------|------------|---|--|------------------|----------------------|
| E1.1 | Maintaining ecosystem processes | E1.1.1 | Soil status | Soil characteristics are sustained and enhanced to provide the best conditions for plant growth and soil health, while chemical and biological contamination is prevented. No land is lost to agricultural production. Desertification and degraded land is rehabilitated. | 74% | SAFA BMRS |
| | | E1.1.2 | Water quality and yield | The release of water pollutants is prevented and freshwater quality is restored. Withdrawal of ground and surface water and/or use does not impair the functioning of natural water cycles and ecosystems and human, plant and animal communities. | 79% | SAFA BMRS |
| | | E1.1.3 | Landcover | Productive and conservation capacity of land is sustained and enhanced. Change in area, habitat loss and transformation are minimised. | 63% | SAFA BMRS TBMF |
| | | E1.1.4 | Ecosystem disruption | Disruption and vulnerability to loss of production, livelihoods and ecosystem components resulting from major disturbances/shocks (e.g. fire, disease outbreaks or mass erosion) is minimised | 16% | BRMS |
| | | E1.1.5 | Pollination | Fruit set rates and yields in insect-pollinated crops are sustained and enhanced. Reliance on external pollination services is minimised. | 11% | |
| E1.2 | Reducing agricultural pest threats | E1.2.1 | New agricultural weed and pest species | Minimise the risk and number of new incursions and/or sites of nationally recognised agricultural disease, weed and pest species. | 26% | |
| | | E1.2.2 | Agricultural disease, weed and pest dominance | Minimise the risk, distribution and abundance of agricultural disease, weeds and nationally listed animal pests. | 74% | |
| E1.3 | Limiting environmental pollutants | E1.3.1 | Environmental risk of toxins | Minimise the toxin risk posed by chemical use to different taxa within agro-ecosystems and surrounding areas. | 53% | |
| | | E1.3.2 | Ecosystem levels of persistent toxins | Minimise the accidental release/chronic contamination events and presence of toxins in selected tissues of wildlife, agricultural produce and humans. | 53% | BRMS |

Objective E1.3: Limiting environmental pollutants

Limiting environmental pollutants is the third key factor contributing to the natural capital outcome (E1). Conventional agriculture is based on high levels of chemical inputs, resulting in serious environmental impacts, health risks and loss of biodiversity in agro-ecosystems (Simons et al., 2010). Environmental impacts include their aerial dissemination and the contamination of soil and water, with largely underestimated negative effects on biodiversity directly or indirectly exposed to these chemicals (Kelly et al., 2010; MacLeod et al., 2012b; Tschamntke et al., 2012).

In addition to meeting the regulatory requirements set out in the Hazardous Substance and New Organisms Act 1996, New Zealand's agricultural sectors need to address increasing consumer concern about pesticide residues in food, and the impact of crop protection practices on the environment. This requires the development and application of strategies to minimise pesticide use through greater adoption of integrated pest and disease management systems (Walker et al., 1997). Such systems aim to minimise pesticide use by avoiding unnecessary applications, optimising pesticide timing and making greater use of selective and more benign pesticides. Demonstrating the environmental benefits of lower pesticide use and safer crop protection practices is also important.

Two indicators are recommended for assessing the environmental risk of toxins and ecosystem levels of persistent toxins (Table 5.2).

Outcome E2: Resilience is secured for future productive use

This outcome focuses on securing environmental resilience for future use of the production landscape. This will require integrated monitoring, investment and management by multiple actors (individual farming families, sectors, regional councils etc.). It sets out to address two key objectives: (1) minimising material and energy subsidies; and (2) maintaining agro-biodiversity.

Resilience is *“the capacity of a system to absorb disturbance and reorganise while undergoing change so as to still retain essentially the same function, structure, identity and feedbacks”* (Walker et al., 2004). Making socio-ecological systems strong enough to withstand perturbations by new threats means learning how to deal with uncertainty and adapt to changing conditions, rather than understanding ecosystem vulnerability (Olsson et al., 2004). The four crucial aspects of resilience are (Walker et al., 2004): (1) Latitude: maximum amount a system can be changed before losing its ability to recover; (2) Resistance: ease or difficulty of changing the system; (3) Precariousness: how close the current state of the system is to a limit or ‘threshold’; and (4) Panarchy: resilience of a system at a particular focal scale depends on the influences from states and dynamics at other scales due to cross-scale interactions.

Adaptability is the capacity of stakeholders in a system to influence resilience and avoid crossing into an undesirable system regime (Walker et al., 2004; Nelson et al., 2007). Transformability is the capacity to create a fundamentally new system when ecological, economic or social conditions make the existing system untenable.

Objective E2.1: Minimising material and energy subsidies

Minimising material and energy subsidies is a key factor contributing to the 'resilience for future use' outcome (E2). Intensification of agriculture both globally and locally is largely dependent on increased use of external inputs (PCE, 2004; MacLeod and Moller, 2006; Moller et al., 2008a; Wood et al., 2010). As such, inputs (e.g., fertiliser, fossil fuels) are often costly, with significant risks to future farming and yields associated with increasing and increasingly volatile fossil fuel prices (Wood, et al. 2010). They also often rely on non-renewable resources, make up a significant component of the energy footprint for food production (Norton et al., 2010) and/or increase the risk of environmental impacts both on and off the farm (e.g., nutrient runoff; biodiversity loss; Power, 2010; Lenzen et al., 2012). From an ecosystem perspective, however, increased inputs are not wholly a threat, as intensively managed agro-ecosystems are only sustainable in the long term if the nutrients and energy extracted as produce are balanced by equivalent amounts of appropriate nutrient and material inputs (Moller et al., 2008a; Pretty et al., 2010). A key challenge is to optimise energy inputs, while reducing greenhouse gas emissions and improving yields to meet the anticipated requirements to provide food, fuel, chemicals and materials for a growing global population (Wood et al., 2010). Two indicators are recommended for monitoring use of non-renewable resources and energy (Table 5.3).

Objective E2.2: Maintaining agro-biodiversity

Maintaining agro-biodiversity is another key factor contributing to the 'resilience for future use' outcome (E2). Diverse agro-ecosystems, characterised by high natural insurance, function against changing environments because they decrease variance in crop yields and, thereby, the uncertainty in the provision of public-good ecosystem services (Tscharntke et al., 2012). Agricultural biodiversity may enhance a system's capacity to absorb and recover from perturbation, or build resilience (Fischer et al., 2006), which in turn potentially reduces reliance on external inputs to maintain production (Milestad and Darnhofer, 2003). The unique feature of agro-biodiversity (microbes, plants, and animals that provide ecosystem services) is the emphasis on its utility to human beings (Matson et al., 1997).

Maintaining genetic diversity of crop-cultivars and livestock breeds is important for producing commercial products, as well as pest and disease management, pollination services and soil processes (OECD, 2001b; PCE, 2004; MEA, 2005; Hajjar et al., 2008; Herzog et al., 2012). The monitoring of beneficial species representing different ecological functions (primary production, herbivory, pollination, predators) and a range of sensitivities to management activities at varying spatial scales is required, to ensure these important components of the system are being maintained (Herzog et al., 2012; Tallis et al., 2012). Agricultural intensification replaces

heterogeneity in habitat structure, in time and space, with homogeneity (Benton et al., 2003), resulting in declines in agro-biodiversity at local and global scales (e.g., Krebs et al., 1999; Chamberlain et al., 2000; Donald et al., 2001; Butchart et al., 2010; Jeanneret et al., 2012; Lindenmayer et al., 2012). The extent, structure, composition and management of non-crop habitats is of particular interest, because these habitats can provide important refuges for beneficial species on farms (Haslem and Bennett, 2008; Lee et al., 2008; Moller et al., 2008a). Three indicators are recommended for monitoring agro-biodiversity - genetic stock, beneficial species, and landscape functional heterogeneity (Table 5.3).

Outcome E3: Contributed to national 'natural heritage' goals

This outcome (E3) focuses on New Zealand's national goal to enhance its natural heritage. It aims to address three key objectives within production landscapes: (1) maintaining ecosystem representation and composition; (2) preventing extinctions and declines; and (3) reducing conservation pest threats.

A high proportion of New Zealand's species are endemic (i.e., found nowhere else in the world) – making these species both valuable and vulnerable. Although common threats of habitat loss, introduced competitors and predators are well known, more information about drivers of change and the extent to which New Zealand's native biodiversity is being protected and sustained will help prioritise investments and farm management changes (Statistics NZ et al., 2013). In the past, biodiversity indicators employed in New Zealand focused on recording management activity inputs, as these are often easily and accurately measured (e.g., area of possum control, number of litres of herbicide used over a given area). However, these do not directly measure the actual biodiversity outcomes achieved from the management activities (Green and Clarkson, 2005; Jones, 2009; Lee and Allen, 2011). This makes it difficult to demonstrate whether biodiversity representation or persistence is improving or not.

Objective E3.1: Improving ecosystem representation and composition

Improving ecosystem representation and composition is a key factor contributing to 'natural heritage' outcome (E3). Ecosystems can be defined by abiotic and biotic factors (Lee et al., 2005); they occupy a range of environments (defined at different scales by climate, soils, topography and disturbance regimes factors) and their composition can vary according to species, functional groups, life-history stages, trophic diversity and structural complexity.

Table 5.3: Objectives and indicators for resilience (E2 outcome), specifying the indicator definition, the percentage of reviewed schemes that monitored similar indicators and key international (SAFA) and local (BMRS and TBMF) frameworks (MacLeod and Moller, 2013).

| Objectives | | Indicators | | Indicators Description | Reviewed schemes | Key links |
|------------|--|------------|------------------------------------|--|------------------|-----------|
| E2.1 | Minimising material and energy subsidies | E2.1.1 | Non-renewable resources | Waste generation is prevented and is disposed of in a way that does not threaten the health of humans and ecosystems and food loss/waste is minimised. | 53% | SAFA |
| | | E2.1.2 | Energy use | Overall energy consumption is minimised and use of sustainable renewable energy is maximised. | 42% | SAFA |
| E2.2 | Maintaining agro-biodiversity | E2.2.1 | Genetic stock | The diversity of domesticated species living in agricultural, forestry and fisheries ecosystems, as well as the diversity of varieties, cultivars and breeds of domesticated species, is sustained and enhanced. | 21% | SAFA |
| | | E2.2.2 | Beneficial species | The status of species (or guilds) that are beneficial to agricultural, forestry and fisheries ecosystems is sustained and enhanced. | 47% | SAFA |
| | | E2.2.3 | Landscape functional heterogeneity | The diversity, functional integrity and connectivity of natural, semi-natural and agro-ecosystems are sustained and enhanced. | 74% | |

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Focusing on higher levels of biological organisation (e.g., the ecosystem rather than species) may provide a pragmatic and cost-effective means of conserving multiple levels of biological diversity. A key challenge for biodiversity conservation is to identify and conserve areas of natural habitat that contain unique and diverse biological assemblages (UNEP-WCMC, 2011) and to ensure their local representation (Lee et al., 2005). New Zealand's rare ecosystems, for example, frequently occur outside existing conservation areas, with opportunities for improvements in their protection and management recently being highlighted using an international threat classification system (MfE and DOC, 2007; Williams et al., 2007; Wiser and Buxton, 2008; Rodriguez et al., 2011; Holdaway et al., 2012). Moreover, the greatest potential to restore the most significant and vulnerable indigenous ecosystems are in lowland and montane areas where production activities are also located.

Three indicators are recommended for monitoring whether ecosystem representation and composition is improving (Table 5.4). These focus on (1) environmental representation and protected status; (2) ecosystem composition; and (3) focal species occupancy of environmental range.

Objective E3.2: Preventing extinctions and declines

Preventing extinctions and declines is another key factor contributing to the natural heritage outcome (E3). Preventing extinctions and population reductions is fundamental for maintaining biodiversity (Lee et al. 2005). Indicators reporting on conservation status of threatened taxa attract high public interest not only in New Zealand, where many endemic species are highly threatened, but also internationally (Butchart et al., 2005; IUCN, 2008). Many small natural habitat remnants across a large geographical area protect more species than a single large remnant of the same area (Tscharntke et al., 2012). However, fragmented populations experience high extinction rates, and many of the most endangered plants and animals need very large areas to survive. One indicator is recommended for reporting on the status of threatened species in New Zealand agro-ecosystems (Table 5.4).

Objective E3.3: Reducing conservation pest threats

Reducing conservation pest threats is the third key factor contributing to the natural heritage outcome. Biological invasions are a major cause of indigenous biodiversity loss in New Zealand (Lee et al., 2005). Mammal predators have caused extinction and reductions in many indigenous animal species, while mammalian herbivores have caused shifts in vegetation composition and structure. Invasive species alter disturbance regimes, displace native species and vegetation, and modify ecosystem processes.

Table 5.4: Objectives and indicators for natural heritage (E3 outcome), specifying the indicator definition, the percentage of reviewed schemes that monitored similar indicators and key international (SAFA) and local (BMRS and TBMF) frameworks (MacLeod and Moller, 2013).

| Objectives | | | Indicators | Indicators Description | Reviewed schemes | Key links |
|------------|--|--------|---|--|------------------|----------------------|
| E3.1 | Maintaining ecosystem representation & composition | E3.1.1 | Ecosystem representation & protection | Sustain and enhance the extent and protection of indigenous cover and habitats or naturally uncommon ecosystems. | 42% | SAFA BRMS TBMF |
| | | E3.1.2 | Ecosystem Composition | A balanced composition of plant and animal species typical and important to the region in natural and semi-natural ecosystems is sustained and enhanced. | 68% | SAFA BRMS TBMF |
| | | E3.1.3 | Occupancy of environmental range | Sustain and enhance the extent of potential range occupied by focal indigenous taxa. | 5% | BRMS |
| E3.2 | Preventing extinctions & declines | E3.2.1 | Status of threatened species | Sustain and enhance the status of threatened taxa and their habitats. | 42% | SAFA BRMS TBMF |
| E3.3 | Reducing conservation pest threats | E3.3.1 | New environmental weed and pest species | Minimise the number and risk of new incursions and/or sites of nationally recognised environmental weed and pest species. | 21% | SAFA BRMS TBMF |
| | | E3.3.2 | Environmental weed and pest dominance | Minimise the risk, distribution and abundance of environmental weeds and nationally listed animal pests. | 42% | SAFA BRMS TBMF |

Agro-ecosystems and neighbouring vegetation can be a source of environmental invasive weeds and pests. In New Zealand, about 80% of environmental weed species that are managed by government agencies arise from garden dumping in marginal habitats, or through the naturalisation of economic plant species outside of cultivation (Sullivan et al., 2004, 2005; Williams and Cameron, 2006; Pyšek et al., 2009). Naturalised populations of wild kiwifruit, for example, emerged in native and exotic forest patches near orchards; this spread was likely facilitated by birds dispersing seed after feeding on waste fruit and growers dumping vines or fruit into surrounding bush patches (Sullivan and Williams, 2002; Logan and Xu, 2006). Improvements in the industry's waste management practices, coupled with proactive control of wild kiwifruit populations by the regional council, are required to significantly reduce the risk posed by this invasive species (Sullivan and Williams, 2002).

Two indicators are recommended for monitoring the status of conservation pests (Table 5.4). One focuses on new pest species incursions, the other on distribution and abundance of established pest species.

Outcome E4: Global environmental change obligations met

This outcome (E4) sets out to address two key objectives for New Zealand to meet its global environmental change obligations: (1) reducing emissions; and (2) increasing carbon sequestration.

Agriculture releases significant amounts of greenhouse gas emissions to the atmosphere, which are driving global warming (i.e., rising average surface temperatures) with large scale consequences (Smith et al., 2008; FAO, 2012a). Carbon dioxide is released largely from microbial decay or burning of plant litter and soil organic matter. Methane is produced when organic materials decompose in oxygen-deprived conditions (particularly from fermentative digestion by ruminant livestock, and stored manures). Nitrous oxide is generated by the microbial transformation of nitrogen in soils and manures, and is often enhanced where available nitrogen exceeds plant requirements, especially under wet conditions. Land-use change associated with agriculture is also a significant but indirect driver of emissions. Agriculture will also likely be adversely affected by global warming, due to changes in temperatures, rainfall patterns and dramatic weather events. Indirect impacts on agriculture via increases in the range and abundance of pest species are also likely to occur.

The 1997 Kyoto Protocol to the United Nations Framework Convention on Climate Change established an international policy context for the reduction of carbon emissions and increases in carbon sinks in order to address the global challenge of anthropogenic interference with the climate system (Pretty, 2008). New Zealand's Land Use and Carbon Analysis System (LUCAS), administered by the Ministry for the Environment, was established in 2005 to support international reporting requirements (MfE, 2010). It is envisaged the recommended indicators will closely align

to those being used or considered for LUCAS, hence supporting national and international reporting initiatives.

Objective E4.1: Reducing emissions

Reducing emissions is a key factor contributing to the global environmental change outcome (E4). Agricultural greenhouse gas fluxes are complex and heterogeneous (Smith et al., 2008). In New Zealand, for example, there are large year-to-year fluctuations in emissions, which are partly driven by changes in agricultural productivity and livestock numbers associated with droughts (MfE, 2010). However, active management of agricultural systems offers possibilities for mitigation, using current technologies to manage more efficiently the flows of carbon and nitrogen in agro-ecosystems (Smith et al., 2008). For example, managing livestock to make most efficient use of feeds often suppresses the amount of methane produced. Approaches that best reduce emissions depend on local conditions and therefore vary from region to region. Emissions of greenhouse gases, in particular carbon dioxide, can be avoided by implementing agricultural practices that prevent the cultivation of new lands now under forest, grassland or other non-agricultural vegetation (Foley et al., 2005). The net benefit of a particular action will depend on the combined effects on all gases, as that practice will often affect more than one gas, by more than one mechanism and sometimes in opposite ways (Smith et al., 2008). One indicator is recommended focusing on monitoring industry efforts to mitigate greenhouse gas emissions and actual trends in emissions (Table 5.5).

Objective E4.2: Increasing carbon sequestration

Increasing carbon sequestration is another key factor to the global environmental change outcome (E4). Carbon sequestration is defined as the capture and secure storage of carbon that would otherwise be emitted to or remain in the atmosphere (Pretty, 2008). Agriculture can contribute to carbon storage, when organic matter is accumulated in the soil, and when above-ground biomass acts as either a permanent sink or is used as an energy source that substitutes for fossil fuels and avoids carbon emissions. Changes in land use and management can facilitate increases in carbon storage. One indicator is recommended focusing on measuring total carbon pools and fluxes in agro-ecosystems (Table 5.5).

Table 5.5: Objectives and indicators for Global Environmental Change (E4 outcome), specifying the indicator definition, percentage of reviewed schemes that monitored similar indicators and the key international (SAFA) and local (BMRS and TBMF) frameworks (MacLeod and Moller, 2013).

| Objectives | | | Indicators | Indicators Description | Reviewed schemes | Key links |
|------------|---------------------------------|--------|---------------------------|---|------------------|-----------|
| E4.1 | Reducing emissions | E4.1.1 | Greenhouse gas emissions | Emission of greenhouse gases is slowed, stabilised and eventually reduced. | 58% | SAFA |
| E4.2 | Increasing carbon sequestration | E4.1.2 | Carbon storage and fluxes | Total amount of carbon stored in agro-ecosystems is enhanced. Fluxes or flows in carbon between agro-ecosystems and the atmosphere are slowed, stabilised and eventually reduced. | 47% | SAFA |

Conclusion

The NZSD environmental framework proposed here is designed monitoring progress towards the overarching goal of agro-environmental integrity in New Zealand's production landscapes. It recognises the need for an integrated management approach and must be implemented across multiple spatial scales and governance jurisdictions to maintain livelihoods, social well-being and restore ecological integrity to New Zealand. The framework design aims to be sufficiently complete and flexible for confronting both global and local needs. The indicators are practical, locally grounded and universally acceptable, in particular being closely matched to systems current being designed and tested internationally (in particular SAFA, 2013b) and locally (by the Department of Conservation and regional councils)

To meet local and national requirements the NZSD team will have to carry out further work with stakeholders to co-design tightly prescribed metrics for the indicators proposed in this chapter (and the others). They will also have to serve the practical needs, opportunities and challenges that confront New Zealand's orchardists, wine growers and makers, foresters and farmers.

Chapter 6: Measuring the contribution of primary-based industries to social well-being

Social Well-being: Ensures livelihood opportunities and respects social and cultural principles of all society.

Social well-being is achieved when the respect for rights of equal access to employment and participation in the value-chain and of safe and healthy working environments and the development of supportive communities facilitate the pursuit of the livelihood aspirations of all members of society.

Introduction

There is very little consensus on how to define 'social sustainability', beyond the fact that it varies with the social and cultural context of within which it is being defined (Shove, 2010; Thompson and Scoones, 2009; Wilder et al., 2010). This has obviously led to many issues regarding its measurement and therefore its usefulness to enterprises and governments, especially in international and cross-cultural situations (Boström, 2012; Vallance et al., 2011; Omann and Spangenberg, 2002). The pillar of social sustainability, or social well-being as it is called in the SAFA (2013b) framework, only emerged with the so-called Brundtland definition of sustainability in the late 1990s (Colantonio, 2011) and has therefore come to be associated with the need for a country or an enterprise to ensure that basic human needs are met and that people have the right and the freedom to pursue and achieve their own aspirations for a better life (WCED, 1987). However, this pursuit is constrained to the extent that it does not impinge on the ability of others, both in the present and the future, to do the same.

The concepts of quality of life and social well-being have more recently emerged as common aspects of sustainability, leading to even further debate regarding the realisation and measurement of such goals.³⁵ The World Health Organization (WHO) has this definition: An individual's perception of their position in life, in the context of the culture and values in which they live and in relation to their goals, expectations, standards and concerns (WHOQOL Group, 1995). The expression 'quality of life' has often been replaced with the word 'well-being' (see OECD, 2001a). This is another aspect which is very difficult to assess. Many components of social life have been suggested as indicators such as employment, income, crime and house prices. While these factors are easily measured, it is more difficult to determine if they should be treated as if they are of equal value or if, for example, crime should be given greater weighting than house prices!

This chapter follows an inductive process which determined the way in which indicators of social well-being were arranged into categories. The selected indicators are then compared to those

³⁵ Indeed there is a journal devoted to this called 'Quality of Life Research'.

included in the SAFA (2013b) framework, with evidence of significant overlap in all but one outcome/theme. Additional explanation of those aspects of social well-being not included in the SAFA framework is provided in order to justify a set of social KPIs that are more appropriate to the New Zealand context and that attempt to assess a broader range of community resilience factors identified as important to sustainability in the international literature.

Categorising indicators of social well-being

Social sustainability indicators are found in a diverse set of assessment frameworks and policy and academic literature on social sustainability as summarised in **Error! Reference source not found.2.4** (in Chapter 2). They can be divided into those that document factors with strong ethical justifications (e.g., non-discrimination in the workplace), those that are more directly associated with definitions of social sustainability or resilience (e.g., social cohesion or connectivity) and those that have the potential to predict broader sustainability of systems or value chains (e.g., breadth of view). While the first category does not directly correlate with sustainability outcomes, their importance from the perspective of customer concerns regarding the social impacts of consumption makes them an essential element of a sustainability dashboard that is expected to translate into a labelling or certification scheme. Many of these indicators are already regulated through New Zealand employment law as is discussed below. The second set of indicators is extremely diverse, reflecting the tendency for the development of indicators that are unique to specific assessment frameworks. The selection of KPIs from this set involves both an analysis of their relevance to the New Zealand context and their capacity to adequately indicate conditions and trends that are of relevance to participants in the value chain. The final category is more limited and generally includes measures suggested within the academic literature. The capacity for these to accurately predict 'sustainability' is context dependent. The inclusion of such measures is less likely to meet existing expectations from consumers, but may provide additional sources of information for stakeholders operating at the production end of the value chains. This latter group was also commonly distinguished by poorly defined, expensive or non-replicable measures – a factor which likely contributed to their absence in the assessment frameworks.

The recommended indicators should not be understood as providing a fully comprehensive assessment of social well-being. Rather they provide an initial suite of indicators that assess recognised ethical standards or features of social sustainability. The intent is to retain a set of measures that is sufficiently comprehensive in light of available literature and existing assessment frameworks. It is also highly likely that these indicators will need to be amended to account for shifting public awareness of what defines sustainable and acceptable practice in agriculture and for emerging measurement capabilities and methods.

The selected KPIs are not necessarily comprehensive in regards to social aspects of production and consumption within the value chain. The framework does, however, enable a focus on more commonly recognised aspects of value chain operation and ones that are more readily associated with practices under the control of stakeholders. As noted elsewhere, the included objectives largely reflect the social well-being sub-themes in the SAFA framework, with the exception that several objective definitions and indicators were altered to account for household and farm level practice (in addition to that of firms). In addition, the framework presented in this

document has added the Community Resilience outcome (which facilitated greater inclusion of indicators related to social capital and cohesion, attachment to place, etc.).

A more practical consideration in prioritising the indicators (and one that, as noted above, may be most relevant in selecting between indicators under the same objective of the framework) involves the availability of relevant data. Where a range of indicators is listed, in most cases the most appropriate one would require data that is already collected for other reporting by the farm or enterprise. In other cases, data that can be readily accessed either through improved record keeping or via secondary sources will increase the appropriateness and the acceptability of a given indicator. Many of the indicators listed within the cultural and community resilience outcomes will, however, require the creation of new data, some of which will involve self-assessment by means of a small suite of questions. Where these are not directly related to factors of production, it will be necessary to clearly explain their relevance to the assessment in order to avoid non-participation.

In order to provide a more streamlined assessment, a further means of prioritising the indicators reflects the extent to which a social KPI is likely to be directly relevant to the information collected for indicators listed under the governance, economic and environmental pillars. For example, indicators of labour rights in the social pillar may draw on a similar set of data to that required for indicators of participation in the governance pillar. Where this is the case, indicators from the respective objectives that require less data collection will be prioritised. The extent to which the linkages between the pillars is apparent at the indicator level is also expected to enhance the comprehensiveness of the assessment.

Relevance considerations

Many of the indicators of social sustainability identified in existing assessments or the broader literature reflect their application to conditions of labour and social relations in the Global South. As such, they largely lack relevance to the New Zealand context where they are factors regulated by labour law or common features of standard practice. For example, regulation of forced labour is an element of both the New Zealand Labour Code and the country's commitments as a participant in international labour and human rights conventions. Child labour, a significant concern with regard to internationally traded agricultural commodities such as cocoa and cotton, poses a more complicated situation. In New Zealand, there are accepted standards of best practice governing the use of child labour with assumptions that human rights will be protected and that the potential for children to participate in the workforce on a restricted basis is a viable and important means of socialisation. That the latter factor has resulted in New Zealand not agreeing to and signing International Labour Organisation (ILO) Convention 180 – which sets a minimum age limit for employment – poses a possible target for consumer concerns that would require KPIs to ensure that exploitation does not occur as a result.

The selection of indicators involves the relevance and importance of indicators within the specified sector for which the NZSD is being produced (e.g., wine, kiwifruit). For example, the extensive use of immigrant labour in the maintenance of vines and during harvest increases the need for verification of employment practices and services and support provided to a more vulnerable labour force. The conditions of wine growing and kiwifruit orcharding involve distinct labour relations that expose these activities to potentially greater scrutiny from consumers and regulators. Specifically, the demand for labour for managing the vines and harvesting fruit has

encouraged the use of temporary immigrant labour. Because such workers face the challenges of working in a foreign country with poorer understandings of their labour rights and the potential for exploitation by less scrupulous employers, there is a greater need for monitoring of compliance with New Zealand labour regulations (see Human Rights Commission, n.d.). The unique position of immigrant workers who require housing and other social services further raises the importance of verifying the availability and use of adequate shelter and access to affordable food, clothing and medical services. Despite the guarantees within the New Zealand legal and regulatory frameworks, incidences of exploitation and mistreatment in similar situations in other countries have led to strong scepticism among consumers and human rights NGOs (for example, see www.ethicalconsumer.org). In this regard the response in high value markets to corruption within the Dole “ethical banana” labelling scheme provides a cautionary example. The distinct post-harvest practices and requirements for kiwifruit and wine do, however, give rise to slightly different emphases in some cases.

Creating the structure of the framework

A concerted effort was made to coordinate the outcomes with themes included in the (UN-FAO) SAFA assessment framework in order to enable comparison with a recognised collection of indicators.³⁶ Following this approach facilitates a similar grouping of indicators to SAFA (2013b) according to aspects of social well-being, i.e., ‘decent livelihoods are secured’, ‘working conditions are acceptable’, ‘equity is supported’, ‘human health and safety is prioritised’ and ‘social resilience is enhanced’ (Figure 6.1 and Table 6.1). The first outcome differs slightly from the equivalent theme used within the SAFA framework in order to capture a broader set of stakeholders including the family farm and other stakeholders where the relevance of self-employment is considered of greater relevance in the New Zealand context. In addition, the framework described here includes the social resilience outcome, which suggests a variety of KPIs that address objectives that have been identified as relevant to sustainability but do not appear as sub-themes in the SAFA framework. While the latter outcome is not directly comparable to a theme in the SAFA (2013b) compliance, it includes factors considered to have high likelihood of relevance to consumer concerns. The following explanation of the framework establishes the justification for the structure of the social well-being outcomes and objectives as well as identifying potential indicators for each. The indicators include both generally recognised (i.e., those that appear consistently in existing assessment frameworks) and relatively unique (i.e., attempts to capture concepts and practices associated with social well-being in the literature) measures.

³⁶ N.B. The Fair Trading Practices Theme included in the SAFA (2013b) framework is not included in the framework recommended within this chapter as its goals and measures are addressed in the Good Governance and Economic Resilience pillars and in more specific objectives including those within the ‘decent livelihood’ and ‘social resilience’ outcomes of the Social Well-being pillar discussed in this chapter.

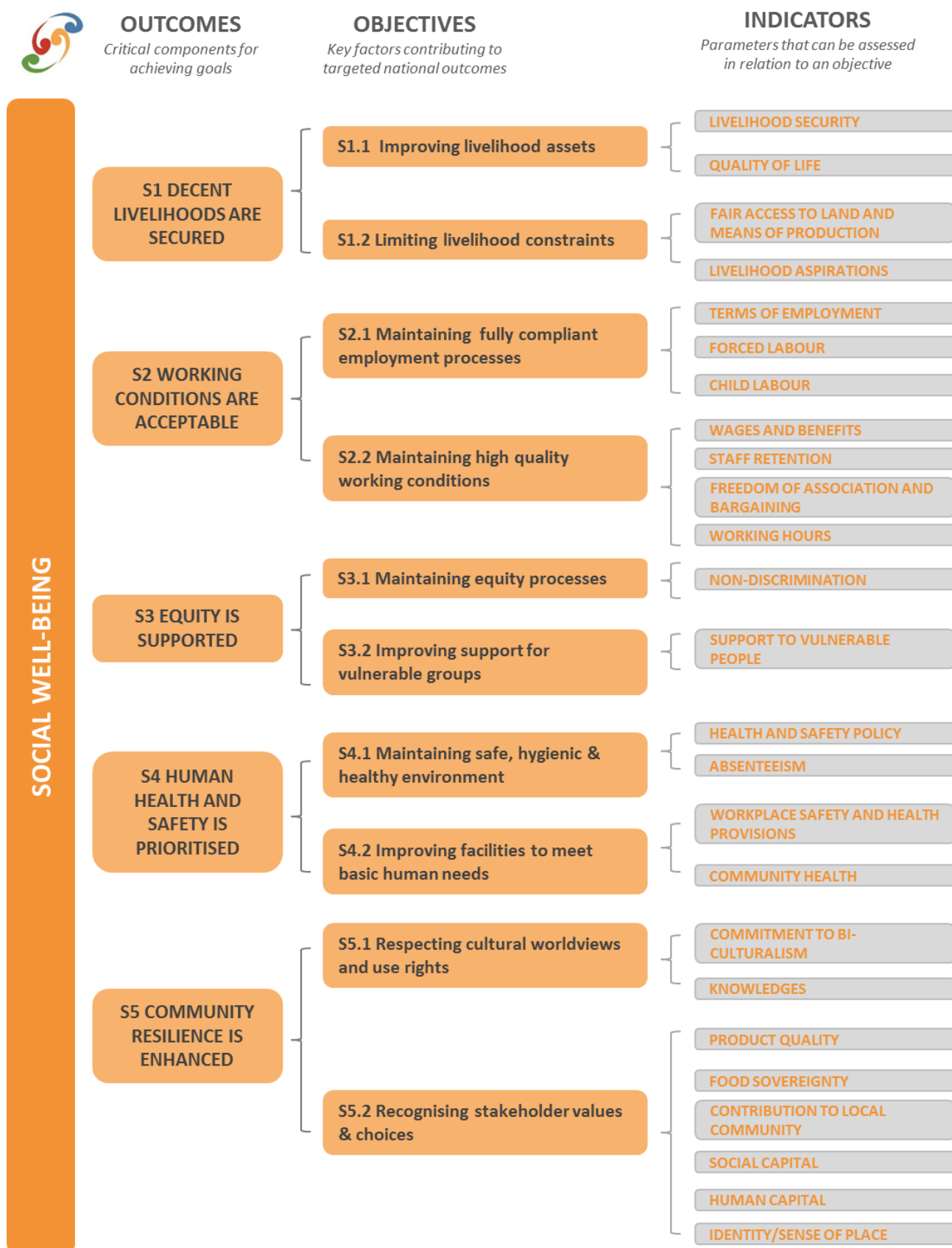


Figure 6.1: Social Well-being Framework in the NZSD

Table 6.1: NZSD Social well-being framework

| Outcomes | | Outcomes description | Objectives | | Indicators | |
|---|-----------------------------------|---|--------------------------------------|--|----------------------------------|---|
| Critical components for achieving goals | | | Key Factors contributing to Outcomes | | Parameters that can be addressed | |
| S1 | Decent livelihoods are secured | Provision of assets, capabilities and activities that increase the livelihood security of all personnel - including self-employed; avoid creating constraints to the realisation of livelihood aspirations. | S1.1 | Improving livelihood assets | S1.1.1 | Livelihood Security |
| | | | | | S1.1.2 | Quality of life |
| | | | S1.2 | Limiting livelihood constraints | S1.2.1 | Fair access to land and means of production |
| | | | | | S1.2.2 | Livelihood aspirations |
| S2 | Working conditions are acceptable | Provision of regular employment that is fully compliant with national laws and international agreements on contractual arrangements, labour and social security and accounts for local understandings of appropriate working conditions beyond national and international criteria. | S2.1 | Maintaining fully compliant employment processes | S2.1.1 | Terms of employment |
| | | | | | S2.1.2 | Forced labour |
| | | | | | S2.1.3 | Child labour |
| | | | S2.2 | Maintaining high quality working conditions | S2.2.1 | Wages and benefits |
| | | | | | S2.2.2 | Staff retention |
| | | | | | S2.2.3 | Freedom of association and bargaining |
| | | | | | S2.2.4 | Working hours/work-life balance |
| S3 | Equity is supported | Pursuit of a strict policy of equity and non-discrimination and pro-active support of vulnerable groups. | S3.1 | Maintaining equity processes | S3.1.1 | Non-discrimination |
| | | | S3.2 | Improving support for vulnerable groups | S3.2.1 | Support to vulnerable people |

| Outcomes | | Outcomes description | Objectives | | Indicators | |
|---|--|---|--------------------------------------|--|----------------------------------|--|
| Critical components for achieving goals | | | Key Factors contributing to Outcomes | | Parameters that can be addressed | |
| S4 | Human health and safety is prioritised | The work environment is safe, hygienic and healthy and caters to the satisfaction of human needs, such as clean water, food, accommodation and sanitary installations. | S4.1 | Maintaining safe, hygienic & healthy environment | S4.1.1 | Health and safety policy |
| | | | | | S4.1.2 | Absenteeism |
| | | | S4.2 | Improving facilities to meet basic human needs | S4.2.1 | Workplace safety and health provisions for employees and self-employed |
| | | | | | S4.2.2 | Community health |
| S5 | Community resilience is enhanced | Respect for the rights (including intellectual property rights) of indigenous communities and the rights of all stakeholders to choose their lifestyle, production and consumption choices. | S5.1 | Respecting cultural worldviews and use rights | S5.1.1 | Commitment to bi-culturalism |
| | | | | | S5.1.2 | Knowledges |
| | | | S5.2 | Recognising stakeholder values & choices | S5.2.1 | Product quality |
| | | | | | S5.2.2 | Food sovereignty |
| | | | | | S5.2.3 | Contribution to local Community |
| | | | | | S5.2.4 | Social capital |
| | | | | | S5.2.5 | Human capital |
| | | | | | S5.2.6 | Identity/Sense of place |

Outcome S1: Decent livelihoods are secured

Provision of assets, capabilities and activities that increase the livelihood security of all personnel - including self-employed; avoid creating constraints to the realisation of livelihood aspirations.

The first outcome assesses the extent to which participation in the value chain either facilitates or impedes the securing of 'decent livelihoods' for all stakeholders (Table 6.2). More specifically, the outcome identifies the role of the enterprise (farm, farm family, processing firm, etc.) in securing livelihoods by providing assets, capabilities and activities for individuals and groups associated with the primary production process (SAFA 2013a). These individuals and groups include the self-employed, family members, employees and contract participants. In addition, the enterprise contributes to the outcome by avoiding the creation of constraints to the livelihood aspirations of the individuals and groups it influences.

As elements of the outcome, we recognise two objectives that account for the potential of economic and social dynamics of the chain to either adequately reward stakeholders through financial returns or limit their capacity through factors such as insecurity of returns or excessive demands on time. In order to represent these diverse facets, the objectives are further organised according to four types of indicator, 'livelihood security', 'quality of life', 'fair access to land and means of production', and 'livelihood aspirations', two of which are comparable to sub-themes in SAFA. The addition of the 'quality of life' and 'livelihood aspirations' indicators is intended to reflect their presence in several assessments associated with the promotion of specifically social sustainability and ethical qualities (e.g., ETI and Fair Trade, SAI, MOST, Certification of Business Competency in Business Analysis (CCBA)). Each of the recommended indicators involves an aspect of the economic life of value chain stakeholders that reflects the aspirations of individuals that are subject to either negotiation with the interests of other stakeholders or constraints that are not easily mitigated or overcome. These indicators, in comparison to similar factors in the social resilience outcome, focus more exclusively on the economic potential associated with participation in the value chain.

Table 6.2: Objectives and indicators for the ‘Decent livelihoods are secured’ (S1) outcome

| Objectives | | Indicators | | Indicators Description | Key Links |
|------------|---------------------------------|------------|---|---|--|
| S1.1 | Improving livelihood assets | S1.1.1 | Livelihood Security | The security of livelihood (including ability to sell product and to gain employment) is promoted within the value chain. | SAFA ETI Montreal Process |
| | | S1.1.2 | Quality of life | All primary producers, small holders and employees enjoy a livelihood that supports culturally appropriate and adequate food and shelter and allows time for personal health and family, social and cultural responsibilities and activities. | SAFA WEF GSCP MEA ONS DEFRA |
| S1.2 | Limiting livelihood constraints | S1.2.1 | Fair access to land and means of production | The access of primary producers to adequate fertile land and to the means of production is not unduly constrained by legal conditions, social structures or economic inequality. | SAFA Social Carbon WWF Gold Standard |
| | | S1.2.2 | Livelihood aspirations | The opportunities to achieve livelihood aspirations and social mobility for all primary producers, small holders and employees (and their children) are not constrained due to their participation and role in the value chain. | SAFA GRI |

Objective S1.1: Improving livelihood assets

The first objective in the livelihoods outcome focuses on the provision of potential assets that support decent livelihoods. It includes two indicators related to stakeholders' capacity to support themselves and their families:

- **Livelihood Security**—assessment of the ability of the stakeholder and stakeholder's family to sell product from the farm or enterprise and to gain employment on terms that ensure secure and consistent relations (SAFA 2013a; Richards 2012, The Montreal Process 2009, ETI³⁷). This could be measured in terms of the documentation of contracts that expressly refer to security of sale or employment during the stipulated period of the contract, the average length of employment, the percent of contracts that are renewed or the number of jobs related to the enterprise or value chain that are available locally (depending on the relationships within the value chain involved) (DEFRA, 2012). If those supply labour are included, a qualitative measure of the perceived accessibility of such employment opportunities could also contribute to the assessment.
- **Quality of Life**—within the livelihood outcome, this refers to the assessment of the capacity stakeholders and their families to maintain access to adequate and culturally appropriate food, shelter, education and health services (SAFA 2013a; Richards 2012, WEF³⁸, GSCP³⁹). In comparison to SAFA, this framework redefines quality of life to account for the potential self-exploitation of labour by farmers and farming families. A basic measure of quality of life would be a ratio of stakeholder income to the cost of living index, although additional qualitative information regarding the extent to which an affordable lifestyle is also culturally appropriate would be required. Alternative measures – again depending on the location within the value chain being examined – might include ease and affordability of access to essential services such as water, food, medical or sanitary facilities, to decent accommodation and to education, leisure options, and other non-work activities (see Botha and Carter, 2007; ONS⁴⁰ and DEFRA⁴¹, 2009; Millennium Ecosystem Assessment, 2005).

Objective 1.2: Limiting livelihood constraints

The second objective draws attention to livelihood aspects that are more susceptible to constraints that result from the practices of enterprises or other social structural factors. Two indicators are used to establish measures within this objective:

- **Fair access to land and means of production**—the access of primary producers to land and means of production should be fair in terms of legal conditions, social structures and economic equality. This indicator can be assessed by means of farm size disparity, the relative age of mechanical or other technological components, or land values relative to income potential (Social Carbon, 2009; WWF Gold Standard cited in Richards, 2012). Farm size disparity is likely to only be a concern where concentrated ownership impedes

³⁷ Ethical Trading Initiative

³⁸ World Economic Forum

³⁹ Global Social Science Programme

⁴⁰ Office for National Statistics U.K.

⁴¹ Department for Environment and Rural Affairs U.K.

the participation of new entrants or the ability to purchase properties of a viable size. It may become more of an issue for consumers exposed to unfair ownership conditions in their own countries. The age of mechanical or other components acts as an alert to the limited ability to invest in innovative practice. The ratio of land value to income is an alternative measure to farm size disparity that assesses one likely cause of such disparity.

- **Livelihood Aspirations**—these aspirations include opportunities through education, training, capital availability and other means of social advancement and social mobility more generally. The indicator seeks to expand that of capacity development (as used in the SAFA framework (2013c: 225)) to include the family members of stakeholders. In this manner it can include measures of succession potential, such as succession plans documented.

Outcome S2: Working conditions are acceptable

Provision of regular employment that is fully compliant with national laws and international agreements on contractual arrangements, labour and social security and accounts for local understandings of appropriate working conditions beyond national and international criteria.

The second outcome for the social well-being pillar assesses the extent to which the conditions under which stakeholders are employed meet established criteria for acceptability (Table 6.3). The intent is to assess the extent to which the enterprise provides regular employment that is fully compliant with national laws and international agreements on contractual arrangements, labour and social security. In achieving these goals, the enterprise will also account for local understandings of appropriate (culturally acceptable) working conditions that exceed national and international criteria. The term ‘working conditions’ applies to the working environment and aspects of an employee's terms and conditions of employment. This covers such matters as: the organisation of work and work activities; training, skills and employability; health, safety and well-being; and working time and work-life balance.⁴² It may also include recognition of alternative holidays, commitments to family responsibilities or the ethical sanction of specific management or processing practices (DEFRA 2012; GSCP).

⁴² <http://www.eurofound.europa.eu/areas/industrialrelations/dictionary/definitions/workingconditions.htm>

Table 6.3: Objectives and indicators for the ‘Working conditions are acceptable’ (S2) outcome

| Objectives | | Indicators | | Indicators Description | Key links |
|------------|--|------------|---------------------------------------|--|---|
| S2.1 | Maintaining fully compliant employment processes | S2.1.1 | Terms of employment | Operations maintain legally-binding transparent contracts with all employees that are accessible and cover the terms of work . Employment is compliant with national laws on labour and social security. | SAFA NZ labour regulations |
| | | S2.1.2 | Forced labour | The enterprise accepts no forced, bonded or involuntary labour , neither in its own operations nor those of business partners . | SAFA NZ labour regulations |
| | | S2.1.3 | Child labour | The enterprise accepts no child labour that has a potential to harm the physical or mental health, or hinder the education of minors, neither in its own operations nor in those of business partners . | SAFA NZ labour regulations |
| S2.2 | Maintaining high quality working conditions | S2.2.1 | Wages and benefits | All employees and self-employed earn at least the local living wage . Includes salaries, income level and benefits | SAFA SAI DEFRA |
| | | S2.2.3 | Staff retention | The level of staff retention indicates whether employees are satisfied with working conditions in an enterprise. | GRI IIRC Saunders et al. Sustainable Business NZ |
| | | S2.2.3 | Freedom of association and bargaining | All persons in the enterprise can freely execute the rights to (i) form or adhere to an association defending workers’ rights , (ii) collectively bargain and (iii) participate in public political process , without retribution. | SAFA |
| | | S2.2.4 | Working hours/ work life balance | All persons (employees, employer and self-employed) in the enterprise have enough rest and free time to recover physically and mentally and to participate in a rewarding family and social life. Overtime is voluntary and fully compensated . | SAFA Field to Market DEFRA GRI |

The structure of this outcome is also very similar to that used in the SAFA theme and other assessment frameworks, although it has been renamed in an effort to account for the conditions of self-employment especially on family operated farms and orchards. The outcome is further divided into objectives that emphasis the maintenance of either ‘fully compliant employment processes’ or ‘high quality working conditions’. It is important to note this outcome largely involves aspects of ethical treatment of workers, and is not specifically tied to sustainability, thus its justification is based on ethical response (see discussion above). Littig and Griessler (2005) argue, however, that there is a basic connectivity between work and nature in that the former is the sole means of meeting essential needs through exploitation of resources derived from the latter. As a result of the reference to ethical treatment, the definition of ‘acceptable’ working conditions directly refers to compliance with existing regulatory standards at both the national and international level and therefore is shared with the Good Governance pillar outcome ‘the rule of law is followed’. It also acknowledges the potential for the local context of employment (reflecting social or cultural conditions of employment relations) to supersede the national or international criteria. Objectives in this outcome distinguish particular types of employment or particular aspects of the employment agreement.

Objective 2.1: Maintaining fully compliant employment processes

This objective focuses on the processes of recruiting labour. Indicators involve widely recognised conditions of appropriate employment practice and are subject to regulation in New Zealand employment law and international agreements.⁴³ They include:

- **Terms of Employment**—the terms refer to the employment agreement between the enterprise and the employee. Compliance is measured first by the documentation of the agreement in an accessible, transparent and legally binding contract. Further indicators involve the assessment of the contracts’ compliance with national laws on labour and social security.
- **Forced Labour**—prohibits the use of forced, bonded or involuntary labour in the enterprise or in the operations of business partners.
- **Child Labour**—sanctions the use of inappropriate child labour, defined as an employment situation that has the potential to harm the physical or mental health or to hinder the educational opportunities of minors. As with the case of forced labour, this stricture extends to the employment practices of business partners as well.

Objective 2.2: Maintaining high quality working conditions

The second objective addresses the actual working conditions at the enterprise, including the level of compensation, the ability to form employee alliances and the length of the work day and

⁴³ The specific Aspects under the theme of Labour Practices are based on internationally recognized universal standards, including: United Nations Universal Declaration of Human Rights; United Nations Convention: International Covenant on Civil and Political Rights; United Nations Convention: International Covenant on Economic, Social, and Cultural Rights; Convention on the Elimination of all Form of Discrimination against Women (CEDAW); ILO Declaration on Fundamental Principles and Rights at Work (in particular the eight core Conventions of the ILO consisting of Conventions 100, 111, 87, 98, 138, 182, 29, 105); and The Vienna Declaration and Programme of Action (GRI, 2012).

week. The indicators all involve mandatory compliance with New Zealand labour regulations and additional reporting of practice by employers. They include:

- **Wages and benefits**—stipulates that all employees (including self-employed) earn at least minimum wages and receive standard benefits. Mere documentation of compliance with minimum wage requirements may, however, be less than sufficient evidence of the financial resilience achieved through participation in the value chain. For these ends, a more appropriate measure (included in some form in SAFA, SAI⁴⁴ and DEFRA 2012) would assess wages relative to the skills and abilities or to the time committed (the latter being particularly relevant for the self-employed).
- **Staff retention**—indicates whether employees are satisfied with working conditions in an enterprise. Economically speaking, an enterprise wishes to have a high rate of staff retention as staff turnover can cost an enterprise because of the cost of training people new to the enterprise, the cost of training already invested in a person who leaves, and the loss of expertise when someone leaves. However, it is also thought that a turnover rate can get too low because it is important to have change as well as stability.⁴⁵
- **Training, skills and employability**—these have been covered under the decent livelihood objective indicator, livelihood aspirations, concerning capacity development.
- **Freedom of association**—assesses the ability of all persons in an enterprise to freely execute the right to form or belong to an association to assert workers' rights, including collective bargaining for working conditions. This indicator would involve both documentation of this ability and, where feasible, a survey of employees at the enterprise to confirm this. An additional measure could assess the ability to participate in a public political process without retribution. Given that the perceived threat of retribution is as great a constraint on freedom as an act of repression, measures would necessarily include an accounting of reported acts of retribution as well as an employee self-assessment of their sense of freedom in regard to political participation.
- **Working hours**—in addition to complying with regulations regarding length of work day and work week, all persons in the enterprise will receive sufficient time for rest and away from the workplace such that they can recover physically and mentally. This indicator would require employer reporting of working hours to gauge length of rest and free time available. Within this context, overtime hours must be documented to be fully voluntary and fully compensated according to New Zealand labour laws and any contract terms. A simple accounting of working hours may obscure the impact of the time committed to the workplace occurring through after-hours' activities, travel time and other factors (Field to Market, 2012). An alternative measure would involve a self-assessment of the work-life balance experienced by an individual, an indicator that has been suggested in assessments of social well-being and happiness (e.g., DEFRA, 2012). A final means of assessing compliance with the working hours indicator involves an employee self-assessment of their ability to participate in a rewarding family and social life.

⁴⁴ Social Accountability International - SA8000 Standard.

⁴⁵ In the UK the average employee turnover rate is 15 per cent, though it varies a lot between industries.

Employment conditions

There are many indicators available to do with compliance associated with the well-being of employees (Hunt, 2013). Workers must be supplied with certain information and records have to be kept. Businesses have to abide by laws and regulations to do with:

- Employee wages/remuneration and benefits.
- Working hours, holidays, sick leave.
- Livelihood security.
- Use of trained staff.
- Using immigrants in the workplace.
- Clothing requirements.
- Health and safety, handling of chemicals, records that must be held, etc.
- Contract labour.
- Employee engagement.
- Personnel Management/Review.
- Seasonal labour.
- Staff training/skills development and enhancement.
- Working times.
- Visitors to a workplace.

As businesses grow they are also more likely to employ labour outside of the family. There are constraints to the use of labour; some of these will be personal, for example, farmers may limit the number of hours they work so that they can spend time with their family. For hired labour there are legal constraints imposed by a large number of Acts covering employee rights and workplace safety. This means many of the SAFA good governance and social well-being measures at the firm level for health and safety and working conditions can be measured by compliance with New Zealand legislation.

Outcome S3: Equity is supported

Pursuit of a strict policy of equity and non-discrimination and pro-active support for vulnerable groups.

Similar to the previous two outcomes, the equity⁴⁶ outcome closely follows that included in the SAFA framework (Table 6.4). The one distinction lies in combining gender with other forms of discrimination as opposed to having a separate objective. Thus, the equity outcome comprises two objectives, 'maintaining equity processes' and 'improving support for vulnerable people'. As an indicator of social well-being, equity includes measures relevant to society as a whole, with indicators of equity and participation specific to the workplace included in the governance KPIs. The two objectives refer to very general sets of goals to ensure non-discrimination and to encourage responsibility toward the needs of more vulnerable people or communities.

⁴⁶ The cornerstone of human rights is the International Bill of Rights which is formed by three instruments: the Universal Declaration of Human Rights (1948); the International Covenant on Civil and Political Rights (1966); and the International Covenant on Economic, Social and Cultural Rights (1966).

Table 6.4: Objectives and indicators for the ‘Equity is supported’ (S3) outcome

| Objectives | | Indicators | | Indicators Description | Key Links |
|------------|---|------------|------------------------------|---|---------------------------|
| S3.1 | Maintaining equity processes | S3.1.1 | Non-discrimination | A strict equity and non-discrimination policy is pursued towards all stakeholders . Non-discrimination and equal opportunities are explicitly mentioned in the Code of Conduct and adequate means for implementation and evaluation are in place. There are no disparities associated with gender, Māori identity, culture, religious adherence, ethnicity or membership of a minority group, concerning hiring, remuneration, access to resources, education, and career opportunities. | SAFA UN |
| S3.2 | Improving support for vulnerable groups | S3.2.1 | Support to vulnerable people | Vulnerable employees and suppliers are proactively supported and accommodated at different life stages and differing levels of ability and disability. | SAFA WWF Gold Standard |

Objective 3.1: Maintaining equity processes

The first objective in the equity outcome involves the development of processes which can verify that the pursuit of equity is an active element of business practice, both within the enterprise and in its business and community relationships. Most aspects of this objective are regulated under New Zealand legislation, although the experience of less powerful participants in the value-chain can be more difficult to assess through official statistics or reporting. Compliance is assessed by means of a single indicator:

- **Non-discrimination**—includes employment statistics such as the number of reported incidents of discrimination and equity of salary among identified subgroups (e.g., gender, ethnicity, etc.) as well as a self-assessment of the extent to which cultural, social or spiritual values can be expressed without recrimination (see Gibson et al., 2010).

Objective 3.2: Improving support for vulnerable groups

Within the outcome, a further objective focuses more specifically on the less powerful members of society as participants in the value-chain. The selected indicator for the objective draws on proposed indicators outside of the SAFA framework to assess the support provided to such groups in order to mitigate the impediments on their participation:

Support to vulnerable people—assesses the support offered to and inclusion of employees and suppliers. Specific measures include both documentation of accessibility improvements in the workplace as well as self-assessment of access to psychological support or protection from bullying (see Littig and Griessler, 2005; WWF Gold Standard, cited in Richards, 2011). While these factors are not specifically associated with sustainability, they raise very important issues from the perspective of ethical social interactions. It is suggested that no occurrence of discrimination at any level is acceptable. Support to vulnerable people is particularly relevant with relation to an immigrant labour force, which is considered to be in a more vulnerable position while working in New Zealand (Human Rights Commission, n.d.). Compliance with this outcome would relate to criteria established in Fair Trade frameworks (ETI).

Outcome S4: Human health and safety is prioritised

The work environment is safe, hygienic and healthy and caters to the satisfaction of human needs, such as clean water, food, accommodation and sanitary installations.

In the recommended NZSD and the SAFA framework, the impacts of the value chain on human health and safety are considered outcomes/themes in the social well-being pillar. This follows the description of the desired outcome/theme for both: a safe, hygienic and healthy work environment that meets human needs with regard to food, water and shelter and provides access to sanitary installations (**Error! Not a valid bookmark self-reference.5**). This desired outcome extends beyond the immediate work environment to the impacts of workplace practices on the health of the affected community. The structure of the outcome includes similar objectives – namely, ‘maintaining safe, hygienic and healthy environments’ and ‘improving facilities to meet basic human needs’ – to the SAFA sub-themes (‘workplace safety and health provisions’, ‘community health’), save for the presence of indicators for both health and safety policy and action in the recommended framework. The recommended KPIs for assessing compliance with

the objectives and progress towards the health and safety outcome are all focused on workplace practice and include readily collected quantitative data or documentation.

Objective 4.1: maintaining safe, hygienic and healthy environments

The first objective in the health and safety outcome deals to the processes which are expected to enable safe, hygienic and healthy environments. These processes include practices of planning and monitoring that ensure both proactive implementation of policies as well as the continuous assessment of the state of compliance with and the performance of such policies:

- **Health and safety policy**—records and assesses evidence of a health and safety policy in the form of either the simple existence of a written plan or a more thorough accounting of the frequency of health and safety training (see SAI).
- **Absenteeism**—the amount of sick leave an employee takes is an indication to the employer of the health of the workforce involved in the enterprise and that, with the level of absenteeism, could be a reflection on working conditions. Also, from a financial perspective, absenteeism costs an employer so it is something management wish to minimise. According to New Zealand's Holidays Act 2003⁴⁷, the purpose of having sick leave is to promote a balance between work and other aspects of employees' lives.⁴⁸ Under the Holidays Act 2003, all employees are entitled to a minimum of five days paid sick leave a year after the first six months of employment and an additional five days after each subsequent 12 month period.^{49 50}

Objective 4.2: improving facilities to meet basic human needs

In addition to the confirmation of policy and processes related to health and safety, a second objective for this outcome addresses the physical infrastructure of the enterprise. In this case, the workplace and management practices and the tools and machinery used to facilitate them are viewed as having the potential to impact on health and safety of both participants in the value-chain and the communities within which the practices occur. The selected indicators use both official reporting as well as participant self-assessment:

⁴⁷ <http://www.legislation.govt.nz/act/public/2003/0129/latest/DLM236387.html>

⁴⁸ <http://www.legislation.govt.nz/act/public/2003/0129/latest/DLM236393.html>

⁴⁹ <http://www.dol.govt.nz/workplace/knowledgebase/item/1244>

⁵⁰ An Australian website states that an acceptable level of absenteeism is 6.5 days of sick leave per year. The Australian average is 9.4 days a year and 5 days for corporate staff. Some organisations with professional staff aim for 2 to 3 days per employee. If people have little control over their work and do not have access to flexible work practices average absences can rocket to 20 days a year. On average, public servants took 11 days off work in 2010-11. See

http://www.afr.com/p/national/work_space/absenteeism_reflects_sick_organisation_QvCKWp1Cz5dtUNGF1rdhaN).

Table 6.5: Objectives and indicators for the ‘Human health and safety is prioritised’ (S4) outcome

| Objectives | | Indicators | | Indicators Description | Key Links |
|-------------|---|---------------|---|--|--|
| S4.1 | Maintaining safe, hygienic & healthy environment | S4.1.1 | Health and safety policy | The health and safety of all stakeholders is promoted through the implementation of policy and active management, monitoring and assessment of that policy. | SAFA SAI |
| | | S4.1.2 | Absenteeism | The amount of sick leave an employee takes is an indication to the employer of the health of the workforce involved in the enterprise and that, with the level of absenteeism could be a reflection on working conditions. | NZ Holidays Act Sustainable Business NZ |
| S4.2 | Improving facilities to meet basic human needs | S4.2.1 | Workplace safety and health provisions for employees and self-employed | The workplace is safe, has met all appropriate regulations, and caters to the satisfaction of human needs in the provision of clean water, healthy food, clean accommodation (if offered) etc. | SAFA Field to Market ACC |
| | | S4.2.2 | Community health | Operations and business activities do not limit the healthy and safe lifestyles of the local community and enterprise contributes to community health resources and services. | SAFA |

- **Workplace safety and health provisions for employees and the self-employed**—includes measures of the frequency of health and safety incidences at the workplace (see Field to Market, 2012) or, in the New Zealand situation, a good or improving Accident Compensation Corporation (ACC) rating of the enterprise. (The ACC rating determines the levy imposed on the enterprise in accordance with its accident record. In New Zealand this government corporation compensates individuals for accidents rather than having them go through a litigation process. In order to pay for this ACC charges a work levy based on injury rates across industry categories. On 1 April 2011, it introduced an experience rating - a system of modifying a business's ACC work levy based on its claims history. Historically a business paid the same work levy as others operating in the same industry, despite differences in their safety record. Experience rating rewards those business owners with safer workplaces, and encourages a focus on improving workplace safety and making New Zealand businesses better places to work.⁵¹) Thus measures of workplace safety could be:
 - Injury rates/lost time injury frequency – rate of frequency per million hours worked.⁵²
 - ACC experience rating - percentage loading/discount rate of company's standard industry levy.

Additional measures would be required to assess the state of any facilities provided for workers, which might include food, water and accommodation. These latter measures are of most relevance in situations where an itinerant or migrant workforce is involved.

- **Community health**—assesses the commitment of an enterprise to the health of the community by means of the life expectancy of the population residing within a determined radius of impact (see Field to Market, 2012; DEFRA, 2012) or more directly (albeit without an assessment of impact) through evidence of community notification with regard to potentially dangerous activities (see Robledo, 2007).

Outcome S5: Community resilience is enhanced

Respect for the rights (including intellectual property rights) of indigenous communities and the rights of all stakeholders to choose their lifestyle, production and consumption choices.

The community resilience outcome is the most distinctive compared to the social well-being themes found in the SAFA (2013) framework. While some of the objectives appear as sub-themes elsewhere in SAFA (namely the cultural development theme), those included in the recommended framework are combined as indicators that contribute to the resilience of the communities affected by the value chain. The 'community resilience' outcome (Table 6.6) has been added to account for aspects of social sustainability identified in both international literature (Colantonio, 2009; DEFRA, 2012; Gibson et al., 2010) and prior ARGOS research findings that do not fit comfortably within the SAFA framework themes. The achievement of this

⁵¹ <http://www.acc.co.nz/for-business/experience-rating/index.htm>

⁵² In 2007 Dairy InSight found that the accident rate of dairy farming in New Zealand was reported as third worst in terms of injuries per person employed for the industry (Tipples et al., 2012).

outcome is defined as the responsibility of the participants in the value chain to respect the indigenous knowledge and Waitangi Treaty claims of Māori specifically and the right to make lifestyle, production and consumption choices for all stakeholders and communities affected by activities more generally. The outcome comprises nine objectives that circumscribe the various aspects of the outcome from indigenous rights ('commitment to bi-culturalism' and 'respect of knowledges') to consumption choices ('product quality' and 'innovation/experimentation as practice') to productive engagement with the community ('food sovereignty', 'contribution to local community', 'social capital', 'human capital', 'identity/sense of place'). Together these objectives are intended to account for less easily measured concepts, which address progress toward greater resilience or potential sustainability.

Objective 5.1: Respecting cultural use rights and worldviews

This objective in the social resilience outcome attempts to account for the specific conditions of New Zealand society given the distinctive status and rights of Māori. In the New Zealand context, reference to culture and its role in social sustainability is strongly influenced by the relationship between Māori and Pakeha and the statutory role of the Treaty of Waitangi. A more comprehensive description of a Māori approach to a sustainability framework and KPIs can be found in a separate report (Reid et al., 2013) and summarised as a chapter in this report. For the broader social well-being KPIs reported here, however, the framework proposes an indicator of consultation with Māori as evidence of compliance within the value-chain:

- **Commitment to bi-culturalism**—confirms the documentation of consultation first with Māori and subsequently with other cultural or ethnic groups in relation to access to and exploitation of local resources in the value chain (UN, 1998). This measure would be predicated by the development of a consultation process in collaboration with locally active organisations.
- **Knowledges**—involves more explicit assessment of the conservation of and respect for diverse, and in particular Māori, knowledge. In this case, the difficulty rests in the need for valuation conducted by the affected population, which may not recognise the parameters within which the enterprise operates. The suggested indicator attempts to address this challenge by requiring the documentation of the extent to which diverse knowledge systems are acknowledged in the normal practice of any participants within the value chain (LOAM, cited in Aldrich and Sayer, 2007). The reference to and engagement with local and tacit (in addition to scientific) knowledge in management decisions and research design is of particular relevance to this measure.

Table 6.6: Objectives and indicators for the ‘Community resilience is enhanced’ (S5) outcome

| Objectives | | Indicators | | Indicators Description | Key Links |
|------------|---|------------|---------------------------------|---|--------------------------------------|
| S5.1 | Respecting cultural worldviews and use rights | S5.1.1 | Commitment to bi-culturalism | All stakeholders demonstrate a commitment to a bi-cultural future based on the Treaty of Waitangi while acknowledging the rights of other cultures to co-exist. This commitment recognises the sovereign rights of Māori to culturally informed resource management including customary and commercial harvest of food, access to land and constraints on resource use. | Treaty of Waitangi |
| | | S5.1.2 | Knowledges | The knowledges (local, scientific, tacit, etc.) of all stakeholders are recognised and valued for their potential contribution to the resilience of production systems. These knowledges are included without bias in research design and management recommendations. | SAFA |
| S5.2 | Recognising stakeholder values & choices | S5.2.1 | Product quality | All participants in the provision of a product demonstrate a commitment to meeting the quality preferences of the consumer, especially in regard to health and safety and nutritional value and the social and environmental impacts of the production process. | ARGOS (Rosin, Hunt) |
| | | S5.2.2 | Food sovereignty | The right of all stakeholders (including suppliers, employees and clients) to pursue their own food production and consumption choices is not compromised. | SAFA |
| | | S5.2.3 | Contribution to local community | Practices contribute to the economic and social viability of the community through provision of capital, employment or products and through the maintenance of a healthy and safe environment. | ONS DEFRA WWF Social Carbon |

| Objectives | | Indicators | | Indicators Description | Key Links |
|------------|--|------------|-------------------------|--|-------------------------|
| | | S5.2.4 | Social capital | Practices do not undermine the social networks or the shared norms, values and understandings of the community or individual and, where appropriate, create additional opportunity for reinforcing and expanding both existing and latent networks to facilitate cooperation within the community and coordination of the value chain. Elements of social capital include institutions such as the rule of law as well as cultural benefits such as language, religion, and sports (Stats NZ, 2008: 19). | Field to Market OECD |
| | | S5.2.5 | Human capital | The ability of stakeholders (including suppliers, employees and clients) to enhance their capacities through training and education and to develop skills through experience is not compromised by practices or policies. There is a generally trend of increasing capabilities (both within and external to the value chain) in the community. | Social Carbon |
| | | S5.2.6 | Identity/Sense of place | Practices enhance the development of a positive contribution of stakeholders (including suppliers, employees and clients) to the community through both a strong appreciation of their role as valued members of the community (i.e., their identity) and an attachment to and sense of mutual responsibility for the well-being (social, economic and environmental) of the community as located in a particular place (i.e., sense of place). | PCE |

Objective 5.2: Recognising stakeholder values and choices

The second objective for the outcome comprises a somewhat diverse set of measures that account for factors that contribute to resilience as noted in the literature on social sustainability. These include a set of indicators that refers to aspects of the orientation of productive practices in the value chain, specifically the extent of commitment to the well-being of the community and those that focus more exclusively on social dynamics (which can be influenced by practices of the enterprise) that impact on the resilience and viability of communities:

- **Product quality**—accounts for the level of commitment to consumer preferences and concerns regarding both the quality (including health and safety related issues) of the product and the impacts of the production process. While the compliance requirements of meeting product quality standards fall within the economic resilience pillar, this focus on the orientations of the employees in the enterprise is a social issue. The suggested measure is an indirect assessment referred to as ‘breadth of view’, focusing on the expressed emphasis on consumer concerns relative to other management and production targets as indicated in a self-assessment in which such intentions are assigned relative rankings (ARGOS, Rosin et al., 2010; Hunt et al., 2011).
- **Food sovereignty**—assesses the impact of value chain activities on the capacity of participants and affected communities (both locally and at broader scales) to pursue food consumption preferences (including own production) in the community. Two measures are suggested for this indicator; an accounting of the proportion of local food demand that is met by self-produced food and a self-assessment of the accessibility of preferred foods (scoring on a seven-point scale from very limited accessibility to very readily accessible) (Robledo, 2007). The first measure addresses the potential for own production in the community. The latter measure provides a potentially more relevant set of data, albeit of a more subjective nature.
- **Contribution to local community**—examines the extent to which the exploration of innovative and alternative practices and technologies is encouraged within the community (see ONS and DEFRA, 2007). It differs from similar indicators in the economic resilience pillar of the framework in that the focus is on the influence of the value chain on such capacity across stakeholders and within the broader community. Because the causative links between the value chain and community capacity are difficult to assess, the recommended indicator is the level of investment in organisations and infrastructure that enable educational opportunities and provide direct support to innovative practices outside traditional occupational training within the value chain (WWF Gold Standard, cited in Richards, 2011). The arguably tenuous linkage suggests that the latter indicator is most likely a minor requirement of the framework until sufficient data is collected to demonstrate whether a positive correlation with community resilience exists. It also measures the extent to which the enterprise enhances the capacity of the local community to realise well-being on the basis of the level of investment in the community activities and services (Social Carbon, 2009).
- **Social capital**—assesses the level of social cohesion within the value-chain and in its relations with the local community and society more generally (OECD 2001a). The suggested indicators for this measure include the extent of knowledge of colleagues’

practices (seven-point from very little knowledge to extensively shared knowledge) as an indicator of collaborative innovation of relevance for decision-makers (Field to Market, 2012) and self-assessment of trust of neighbours (seven-point from very little trust to very strong trust) for community members.

- **Human capital**—measures the investment in the capacity and skills of the individuals participating in or affected by the value chain. Compliance with this measure involves the availability of educational and training opportunities in the community as indicative of the positive influence – or, at least, the lack of negative impact – associated with the operation of the value-chain and, more specifically, the enterprise (Social Carbon, 2009). This accounting could be compared to average levels for other similar communities in New Zealand.
- **Identity/Sense of place**—attempts to account for the benefits to sustainability associated with an individual's awareness of and interest in the social and environmental dynamics and features of their more immediate surroundings – that is, the place where they reside (Hay 2006; PCE 2001). The suggested indicators address an individual's sense of place (seven-point from very weak association to the locality to very strong association to the locality) and the level of investment by enterprises that is intended to enhance the desirability of the locality (for example, in infrastructure and aesthetic features) in order to assess trends in the local sense of place and account for activities likely to promote this.

Conclusions

The initial prioritisation of social well-being KPIs on the basis of the SAFA (2013) framework is an attempt to account for factors that have been recognised as important and relevant within an international effort to harmonise sustainability assessment in the agriculture sector. The inclusion of indicators that conform to this framework facilitate claims to comparability as well as providing legitimacy within international forums. Where an assessment does not include indicators to account for themes and sub-themes identified in the SAFA (2013) framework, NZSD case study participants using that assessment will need to prepare a defence of such an omission. Where outcomes and objectives that are not included in SAFA have been added, the additional indicators would provide a point of difference and possible source of value to the participants in the assessment.

Using the New Zealand wine and kiwifruit value chains as an example of contexts in which the NZSD project is engaged, the identified KPIs would show a strong similarity to those of SAFA (2013). Whereas some of the SAFA indicators were strongly associated with existing legal codes in New Zealand, the KPIs still include recommendations for a focus on labour rights beyond legal requirements to account for consumer scepticism with regard to treatment of immigrant labour. In cases where differences occur, these often involve either slight variation in definitions of an outcome/theme (for example, a broader reference to decent livelihoods to include self-employed producers) or the definition of an objective/sub-theme (for example, the targeting of specifically community health factors).

Recommended KPIs also reflect a much larger set of objectives under the outcome of community resilience than are contained in the SAFA (2013) framework. These are drawn from the international literature on indicators of social sustainability as well as from previous ARGOS research findings (i.e., breadth of view). All of these latter indicators are more exploratory and attempt to measure aspects of sustainability that do not appear as traditional functions of the value chain. As indicators which draw the attention of consumers, they are loosely comparable with features of Fair Trade certification and provide a potential point of difference and act as pre-emptive response to concerns about the broader social implications of a given value chain.

As a whole, the indicators identified here are, as noted above, an attempt to approach a more representative set of sustainability indicators. The product is, by necessity, emergent – that is, it should not be considered complete or relevant to all future concerns. As a result, the KPIs included in the NZSD will require stakeholder input over time. The chosen indicators are, in other words, subject to negotiation that may involve the identification of alternative measures to account for data availability or new tools/techniques of measurement. Equally, it is possible that the structure of the framework (its outcomes and objectives) may change to account for changing emphasis in the public concerns for social well-being. The framework presented in this document is an initial set of KPIs that are supported by existing assessment frameworks and by the international literature on social sustainability. They, thus, are strongly recommended as indicators of social well-being, providing a strong foundation on which to build a truly sector specific set of measures.

Chapter 7: Next steps to refine and implement the NZSD: meeting stakeholder needs

Iterative and interactive process of refinement

The NZSD project aims to provide a tool for sustainability assessment and reporting that is not only useful to stakeholders, but also enduring. It will use an iterative and interactive process (Figure 7.1) to refine and further develop the proposed NZSD framework. This process recognises the following issues often encountered when establishing such a monitoring scheme (Moller and MacLeod, 2013) and sets out to address them:

- We cannot assume we have got the framework right from the start.
- Abrupt and whole-scale change could unsettle many actors and challenge confidence and pride in progress to date, and ultimately build apprehension and resistance.
- Going too fast is likely to invite mistakes and undermine credibility.
- Going too slow will build frustration and could even undermine collaboration in the monitoring endeavour, as well as expose the agriculture sector to existing and escalating risks from unsustainable practice.

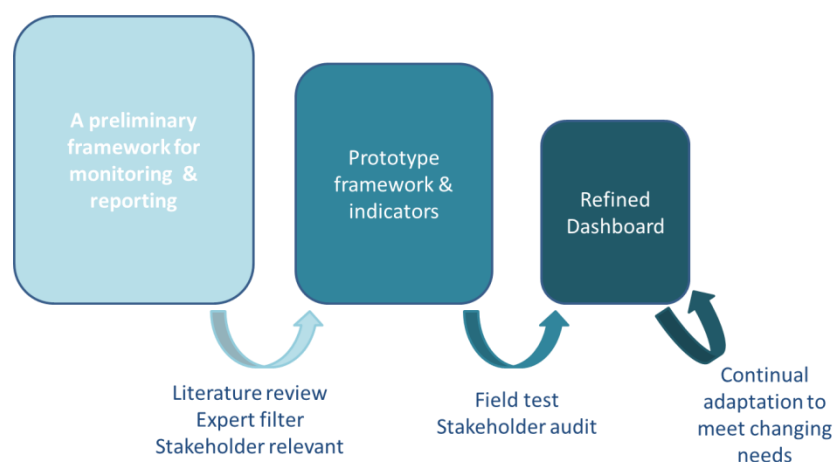


Figure 7.1: Iterative and interactive process to review framework design

Source: Moller and MacLeod, 2013, adapted from Herzog et al. 2012.

A gradual deepening and broadening of the scope of the dashboards is anticipated in the next stage of the NZSD development. However, the formation of the relationships, trust and willingness to participate is much more important than the actual content of prototype dashboards, their indicators, or the way we link them into a framework (Moller and MacLeod, 2013). A review of sustainability dashboards overseas identified many that seem to have sunk without trace once the research team that created them had completed the design (The AgriBusiness Group, 2013). Embedding the dashboard into the 'community of practice' (Madsen and Noe, 2012) and having that community take full ownership of its subsequent use and evolution is the key to the sustained use of the tool.

Clarifying and harmonising sustainability goals

The very first step in goal definition is to clarify what is meant by ‘sustainability’ (Moller and MacLeod, 2013). The concept of sustainability has broad political appeal and provides the basis for several international monitoring frameworks (OECD, 2001; SAFA, 2013). However, despite concerted academic effort by dedicated transdisciplinary teams, the concept of sustainability is difficult to define in precise terms. Some argue that ‘*defining sustainability is ultimately a social and somewhat arbitrary choice about what to develop, what to sustain and for how long*’ (Parris and Kates, 2003). There is sometimes strident disagreement on which domains should be included in sustainability assessment.

The NZSD provides a clear and common framework for defining sustainability goals, outcomes and objectives for the businesses and organisations associated with New Zealand’s production landscapes that will help stakeholders to make their own goals more explicit. The NZSD framework design is based on a review of key sustainability goals and concepts set out in policy, sustainability frameworks and the published literature to ensure it is not only scientifically robust, but also relevant both locally and internationally (Figure 1.5).

Next steps in the NZSD framework development process will include:

- *Ensuring the framework is comprehensive.* Embracing diverse values and goals can only succeed if the process used to develop the framework and indicators is inclusive and collaborative (Van den Belt, 2004). We will invite feedback on our preliminary framework from key stakeholders and experts, to ensure that the NZSD encompasses a wide range of goals of interest.
- *Tailoring the framework to meet specific stakeholder needs.* What works for one sector or ecological landscape may not help sustainability of a different sector, so taking a ‘one size fits all’ approach to designing a single NZSD would be risky, especially if it is generated mainly by consultants and researchers. Creating a single NZSD and attempting to insert it within different sectors could also undermine crucial buy-in and excitement of the participants and hosts who are co-designers rather than simple end-users. To demonstrate how the proposed NZSD framework can be applied to meet specific needs, we will focus initially on developing five prototype dashboards (kiwifruit, wine, Māori enterprises, organic farming and forestry enterprises). As lessons emerge, we hope to have subsequent development of NZSDs for aquaculture, dairy and sheep & beef and that these will be more efficient because they will incorporate successful core features developed for earlier dashboards.
- *Integrating and harmonising monitoring goals.* It is aimed to understand how New Zealand agro-ecosystems, global food supply chains and international economic forces are linked to form a complex adaptive system (Moller and MacLeod 2013). This system is turbulent, poorly understood and lacks coordinated communication and risk management. The NZSD will reconnect multiple ‘layers and players’ and attempt to combine compliance, reporting and learning into a complete package. Matching and integrating the NZSD with local monitoring frameworks is important to address needs at an intermediate scale (e.g. catchments, regional and national). New Zealand’s ecosystems and biodiversity (e.g., threatened indigenous biota) and agro-ecosystems, for example, require special emphases; this not only highlights the importance of alignment to a coordinated

biodiversity monitoring and reporting system currently being developed by the Department of Conservation and regional councils, but also an opportunity to support national environmental policy, state of the environment reporting and inform sustainable land management.

Indicator selection, development and implementation


Indicators are mostly quantitative measures that are selected to assess progress toward or away from shared goals or to assess the state of a resource at any particular time (Parris and Kates, 2003; Bell and Morse 2008). They are used as a vehicle for communicating information in a summary form about issues important to stakeholders. Therefore, the choice of indicators must not only match public and political needs, but also be analytically sound, measurable and easy to interpret.

Prioritising indicators for deployment

All indicators in the NZSD framework are important for driving sustainable practice. The practical reality is, however, that not all indicators can be deployed immediately. Approximate relative ranking is needed, therefore, to capture maximum immediate benefit, depending on what is required to obtain the necessary information and stakeholder priorities. Informing this prioritisation process will require classifying indicators according to their importance, costs, readiness for immediate deployment, measurability and sampling frequency (Figure 7.2).

To help the early stages of implementation, and identify where further development is required, indicators could be broadly prioritised according to their importance (from a scientific perspective) and cost (from a practical perspective; Figure 7.2). Where a potential indicator is ranked of 'low' importance in the framework, this would need to be interpreted in a relative sense only. We would expect relative importance to change as more stakeholders (farmers, industry, regional and national policy makers) learn about agro-ecosystems and as food supply and production chains experience unexpected turbulence. Each host industry would need to check these scales and adjust ranks according to the specific opportunities and threats confronting their own sector and regions. Whatever the sector-adjusted ranks for individual indicators, we suggest that preliminary indicator selection considers all the design criteria set out in MacLeod & Moller (2013), and is further prioritised as follows:

1. An iterative process of perfecting the framework should start by co-opting some of the more fragmentary indicators already being monitored by each sector and then gradually migrating and broadening the scope of monitoring into a long-term and more comprehensive package.
2. Policy relevance and direct link to keystone elements, feedbacks and drivers of the agro-ecosystem is paramount, but it must also be meaningful and acceptable for the growers.
3. Time and monetary costs of monitoring need to be acceptable for both the individual growers and the industry.
4. Only indicators that are already proven to be scientifically reliable and interpretable should be immediately deployed across the entire sector.

 The New Zealand Sustainability Dashboard

AGRO-ENVIRONMENTAL INTEGRITY FRAMEWORK

| | | RANKING CLASSIFICATION | | | | | |
|------------|---|------------------------|------------|------|-----------|---------------|-----------|
| OBJECTIVES | INDICATORS | PRIORITY | IMPORTANCE | COST | READINESS | MEASURABILITY | FREQUENCY |
| E1.1 | SOIL STATUS | ■ | ■ | □ | ■ | ■ | □ |
| | WATER QUALITY & YIELD | □ | ■ | ■ | ■ | ■ | ■ |
| | LAND COVER | ■ | ■ | □ | ■ | ■ | □ |
| | ECOSYSTEM DISRUPTION | ■ | ■ | □ | ■ | ■ | ■ |
| | POLLINATION | ▨ | ▨ | ■ | ■ | ■ | ■ |
| E1.2 | NEW AGRICULTURAL DISEASE, WEED & PEST SPECIES | □ | ■ | ■ | ■ | ■ | ■ |
| | AGRICULTURAL DISEASE, WEED & PEST DOMINANCE | ▨ | ▨ | ■ | ■ | ■ | ■ |
| E1.3 | ENVIRONMENTAL RISK OF TOXINS | ■ | ■ | □ | ■ | ■ | ■ |
| | ECOSYSTEM LEVELS OF PERSISTENT TOXINS | ▨ | □ | ■ | ■ | ■ | □ |
| E2.1 | NON-RENEWABLE MATERIALS | □ | ■ | ■ | ■ | ■ | ■ |
| | ENERGY USE | ■ | ■ | ■ | ■ | ■ | ■ |
| E2.2 | GENETIC STOCK | □ | □ | □ | ■ | ■ | ■ |
| | BENEFICIAL SPECIES STATUS | ■ | ■ | ■ | ■ | ▨ | ■ |
| | LANDSCAPE FUNCTIONAL HETEROGENEITY | ■ | ■ | ■ | ■ | ■ | □ |
| E3.1 | ECOSYSTEM REPRESENTATION & PROTECTION | ■ | ■ | ■ | ■ | ■ | □ |
| | ECOSYSTEM COMPOSITION | □ | ■ | ■ | ■ | □ | □ |
| | OCCUPANCY OF ENVIRONMENTAL RANGE | ▨ | □ | ■ | ■ | ■ | □ |
| E3.2 | STATUS OF THREATENED SPECIES | ■ | ■ | ■ | ■ | □ | □ |
| E3.3 | NEW CONSERVATION WEED & PEST SPECIES | ■ | ■ | ■ | ■ | ■ | ■ |
| | CONSERVATION WEED & PEST DOMINANCE | ▨ | ▨ | ■ | ■ | ■ | ■ |
| E4.1 | GREENHOUSE GAS EMISSIONS | □ | □ | □ | ■ | ■ | ■ |
| E4.2 | CARBON STORAGE & FLUXES | □ | ■ | ■ | ■ | ■ | □ |

KEY: ■ High □ Moderate □ Low ▨ Variable, context dependent

PRIORITY: for deployment, where importance was assumed to have more sway than cost.

IMPORTANCE: from an agro-ecosystem processes perspective

COST: from a monitoring perspective.

READINESS: from a monitoring perspective.

MEASURABILITY: rough guideline on ability to accurately estimate indicator status or trends.

FREQUENCY: of monitoring likely to be required.

Figure 7.2: Potential ranking classification system for prioritising indicators for implementation, using agro-environmental integrity framework as example (MacLeod and Moller, 2013).

5. Qualitative scores are valuable and entirely appropriate for some aspects of sustainability, but where a choice exists, semi-quantitative and especially quantitative approaches should be selected.

A very crude priority ranking of indicators for the agro-environmental integrity framework (Figure 7.2), for example, suggests rapid deployment of soil status, land cover, energy use, beneficial species, landscape functional heterogeneity, and ecosystem representation and protection. The latter two will often need to be managed and monitored well beyond the individual vineyard, orchard, farm, or forest patch level so they are likely to be high priority for collaborative work between farmers, regional councils and the Department of Conservation. Agricultural and conservation weed and pest issues are expected to be high priority in some catchments but not others, hence collaborative trials with regional councils and the Department of Conservation target those catchments could be used to maximise the benefits of the collaboration.

Co-designing tightly prescribed and cost-effective metrics

NZSD researchers, industry facilitators and other key stakeholders⁵³ will next to co-design tightly prescribed metrics for each of the indicators proposed in the NZSD framework.⁵⁴ Several composite indicators can be deployed to summarise large quantities of information and spread the scope of the framework. A wider mapping exercise will automatically link to databases within the NZSD (Figure 7.3 provides an example of this) and outside it. Careful selection of all measures (Table 1.2), defining what is measured or how an indicator is scored forces fine tuning of monitoring to serve the practical needs, opportunities and challenges that confront New Zealand's orchardists, wine growers and makers, foresters and farmers.

An assessment of the frequency for repeated measurements (Figure 7.2) will be required to ensure sampling designs are cost-effective (e.g., Monks and MacLeod, 2013). Measurements of dynamic variables need to be repeated frequently for trend detection and early warning of threats and opportunities. In many cases an adaptive monitoring process could be applied, where more detailed and frequent monitoring is implemented only when and where risk or opportunity is signaled.⁵⁵ This would relieve the monitoring burden on all agricultural enterprises and help concentrate the attention of growers when more infrequent and coarse-level monitoring suggests they are approaching a critical threshold.

Reliability checks once NZSD prototypes are operating

Indicators will only make a difference if they are trusted. We will therefore develop a rigorous field testing and independent auditing of the prototype NZSD measurements and each subsequent additional measure as they are introduced. These checks must reflect the

⁵³ Including regional councils, Ministry for Primary Industries, Ministry for the Environment, Department of Conservation, Environment Protection Agency, Statistics New Zealand

⁵⁴ A preliminary spreadsheet of over 150 metrics has been drawn up for consideration by the participating growers and industry advisors.

⁵⁵ See Moller & MacLeod (2013) for suggestions for monitoring rotors and scaling up monitoring where and when it is most needed. Breaching amber or red alert levels could trigger more intensive monitoring as well as farm management intervention to recover the situation

international best practice criteria.⁵⁶ For each indicator, we will need to demonstrate and quantify levels of:

- Honesty
- Repeatability
- Sensitivity and specificity
- Scale appropriateness and scalability
- Precision and, where required, accuracy and bias
- Statistical power to detect trends and accurate benchmarking between similar orchards, vineyards, wineries, farms and forests.

Practice-based indicators are likely to be incorporated because they are likely to be affordable, easy to score, integrate and cover a wide scope of issues and match the way a farmer organises his/her work planning.⁵⁷ However, usually they are only assumed to trigger desired sustainability outcomes rather than demonstrating that the assumed outcomes are realised. Researchers must check any important practice-based indicators deployed in the NZSD to critically evaluate whether they deliver the expected gains for sustainability and resilience.

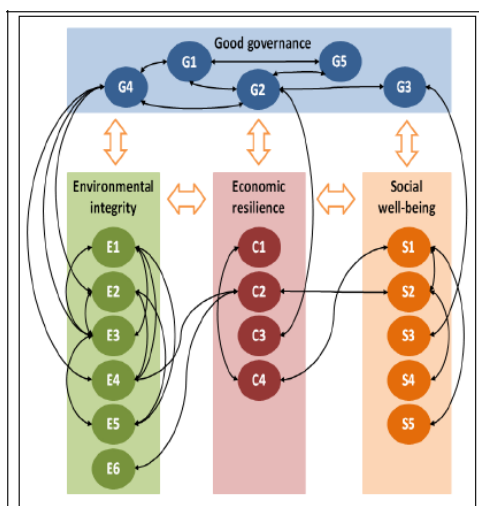


Figure 7.3: Interrelations between SAFA sustainability dimensions and themes

(Source: SAFA, 2012a: 39. Theme numbers are as in the SAFA 2012a version.)

Thresholds and benchmarks

This step in the development of KPI measurements also involves the setting of thresholds of either tolerance or desired achievement. It is necessary to identify three types of thresholds reflecting the expectations of compliance and the capacity to measure absolute levels achievement. At one extreme, there are indicators that require absolute or complete compliance. These would include indicators for which any level of non-compliance would be considered unacceptable, for example slave labour or toxins in food. A similar set of indicators have desired thresholds of absolute compliance, but also involve recognised levels of existing non-

⁵⁶ Reviewed in detail by Moller and MacLeod (2013).

⁵⁷ See Moller and MacLeod (2013) for more detailed comparisons of practice and performance based indicators.

compliance. In these instances (e.g., women in management positions), the threshold may involve evidence of an improving trend. A further set of indicators (e.g., contribution to local community) has recommended levels or measures of achievement for which theorised or assumed benefits can be attributed. In most cases, because of either the lack of pure scientific experimentation or the high variability in social identity and character among individuals and communities, the suggested thresholds will need to be adjusted in order to best represent the context of the value chain within which they are applied.

The indicators which require absolute compliance are predominantly those related to ethical behaviour. As noted above, these include many practices that are regulated by New Zealand laws on employment, non-discrimination and health and safety. Shared international levels of concern regarding these types of practices elevate the importance of compliance to avoid consumer sanction of the value chain. In many cases, for example labour and human rights, these indicators are also legally subject to compliance within New Zealand regulations. Other examples of regulated practice involve practices without strict ethical boundaries, but that involve legal considerations related to flexibility, openness, etc. Thresholds for such KPIs will usually be set at a high level of compliance.

A second category of indicators involves practices that are not legally required, but are considered representative of good or desirable practice by consumers or other external observers. Generally, the impact of these practices is more difficult to measure, a factor which partially explains their absence from commonly collected social statistics. As a result, the setting of thresholds for these indicators faces several challenges: limited verification or policing of compliance; limited justification of practice; lack of comparison with more general data. As a result, thresholds are likely to be better applied to trends – showing improvement over time; to require a broader range at threshold levels; and to involve continuous negotiation. In some instances these types of indicators have been designated 'minor' requirements, which are targeted but do not result in exclusion from certification.

A subset of the indicators of desirable practice include practices that are considered to be closely related to the resilience of the value chain and the communities, ecologies and economies with which it interacts. They reflect theorised relationships between social practice or actions and resilience based on case study analysis in specific contexts. Thus, their applicability in other contexts is not guaranteed. These are more likely to require continued updating and monitoring along with more proven assessments of resilience. As with the main set of desirable practices, threshold levels are difficult to set and may be highly context dependent, reflecting the needs and character of the individuals, communities, ecosystems involved.

- *Context.* It is expected that the spreadsheet of indicators that has been developed for the NZSD will need to be contextualised. First, the goals, which describe the sustainability goal that is to be achieved, may need to be adapted or eliminated dependent on the relevance to the sector (e.g., wine) and the level at which the NZSD is supposed to relate (e.g., family vineyard or corporate winery). Secondly, the core indicators will need to be measured in a particular way, and with units of measurement that apply to their context. For example, it is no use measuring production on a vineyard with the same measurement that you would use to measure production in a winery.

- **Thresholds for measurements of achievement.** The NZSD is going to use a three level rating scale which is mapped onto the four level scale used by SAFA. It will look something like the description in Table 7.1 but will be modified as appropriate to their industry by users of the individual Dashboards.

Table 7.1: Descriptions of thresholds for the Dashboard

| Rating | Performance |
|---|--|
| Good sustainability Performance | <p><u>Performance</u>: The sustainability goal is reached in more than 60% of operations⁵⁸.</p> <p><u>Compliance</u>: All operations fully comply with applicable law and agreements.</p> <p><u>Measures</u> (only for some categories): In more than 60% of operations, substantial⁵⁹ measures to improve sustainability performance have been taken.</p> |
| Concern about sustainability Performance | <p><u>Performance</u>: The sustainability goal is reached in less than 60% of operations.</p> <p><u>Compliance</u>: All operations fully comply with applicable law and agreements.</p> <p><u>Measures</u> (only for some categories): In less than 60% of operations, substantial measures to improve sustainability performance have been taken.</p> |
| Insufficient sustainability Performance | <p><u>Performance</u>: Operations damage environment, economy and society.</p> <p><u>Compliance</u>: Operations violate applicable law and relevant agreements.</p> <p><u>Measures</u>: No effective improvement measures have been taken.</p> |

Source: Adapted from FAO (2012a: 30) and SAFA (2013a: 45).

Refining indicator selection and measures

Just as farmers mainly learn to farm by getting out there and doing it, the NZSD coalition of practitioners, industry facilitators, consultants and researchers must now learn how to monitor effectively by doing it. Ultimately, monitoring is a practical activity that needs to blend as seamlessly as possible with efficient food and fibre production, so indicators need to be road-tested by the practitioners themselves. Accordingly, the NZSD has planned a set of milestones to mark progress towards development of prototype dashboards, followed by formal investigation of their strengths and weaknesses. Polling of the participants through the NZSD itself will focus on how to improve its performance and usefulness to the growers. These polls will be complemented by in-depth interviews as successive NZSD prototypes are implemented and perfected. Participation rates will be monitored automatically by the software to measure how many growers visit the NZSD site, which pages they consult and for how long, and ultimately whether those using the NZSD change their farming sustainability performance more than those who hardly use it. Should the system indicate low levels of uptake, targeted interviewing and polling could be used to investigate causes and suggest solutions.

⁵⁸ In terms of the number of employees, the amount of produce, the area, the number of animals etc. directly affected by improvement measures.

⁵⁹ In terms of investment made, the impact of operations (interruptions, restructuring, require training of employees etc.) and the effects on sustainability performance.

We expect and encourage continual challenge and refinement of the indicators proposed and especially rapid evolution of the metrics used for each indicator as the NZSDs are operationalised. Nevertheless we have proposed a general framework that we hope is sufficiently complete and flexible to confront global and national needs, while still being cast in locally grounded and relevant terms for growers and agricultural industry sectors to future-proof what they do best: the efficient production of high quality food and fibre in a way that maintains the natural capital of the land and contributes to shared national and global goals for environmental, economic, and social sustainability and resilience.

Abbreviations

General abbreviations

| | |
|------|---|
| MAF | Ministry of Agriculture and Forestry (changed to MPI in 2012) |
| MPI | Ministry for Primary Industries |
| MBIE | Ministry of Business, Innovation and Employment |
| NZSD | New Zealand Sustainability Dashboard |
| RISE | Response-Inducing Sustainability Evaluation |
| SAFA | Sustainability Assessment of Food and Agriculture Systems |
| SFB | Sustainable Family Business model |
| SI | Sustainability Indicator |

Financial abbreviations

| | |
|---------------|---|
| COS | Cash orchard surplus = income minus operating expenditure |
| C & NC feed | Cash and non-cash supplements |
| C & NC Labour | Cash and non-cash labour |
| EBIT | A measure of how profitable a company's assets are in generating revenue |
| EBITR | Earning Before Interest, Tax and Rent – Farm profit before interest, tax and rent |
| EOS | Economic Orchard Surplus (difference between income and expenditure which has an adjustment for soil P and unpaid labour) |
| EFS | Economic Farm Surplus (EFS) – the return available to the owner operator of a freehold, unencumbered farm after allowance has been made for labour and management input and is calculated as follows: $EFS = \text{Farm Profit before Tax} + \text{Managerial Salaries} + \text{Interest paid} + \text{Rent paid} - \text{Assessed managerial reward (equivalent ruling wage for an experienced farm worker} + 1\% \text{ of farm capital for management)}$ |
| FTE | Full-time equivalent |
| FWE | Farm Working Expenses |
| FWE/GFR | Farm Working Expenses divided by Gross Farm Revenue (a measure of the 'efficiency' of the farm because it measures the proportion of the revenue that is spent on the workings of the farm. |
| GFR | Gross Farm Revenue – total revenue earned from the year's farming operations. From this. Total Farm Expenditure that was spent to generate the farm revenue is deducted to show the Farm Profit Before Tax (PBT) for the year. |
| GOR | Gross Orchard Revenue (income) |
| NCI | Net Cash Income |
| NFPBT | Net Farm Profit Before Tax |
| NPV | Net Present Value |
| OWE | Orchard Working Expenses |

References

| | |
|------------|--|
| OWE/GOR | Orchard Working Expenses divided by Gross Orchard Revenue (a measure of the 'efficiency' of the orchard because it measures the proportion of the revenue that is spent on the workings of the orchard). |
| ROA | Return on Assets |
| ROE | Return on Equity |
| RoR on TFC | Rate of Return on Total Farm Capital = EFS as a percentage of Total Farm Capital. |
| TFC | Total Farm Capital is defined as Farm Capital (farm assets at market value) plus an allowance for working capital. The working capital allowance is necessary because of timing differences between farm revenue and expenditure resulting in overdrafts to finance expenditure, or high credit balances to pay for upcoming expenditure. The working capital allowance is assumed at 50 per cent of the sum of Working Expenses and Assessed Managerial Reward. |

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