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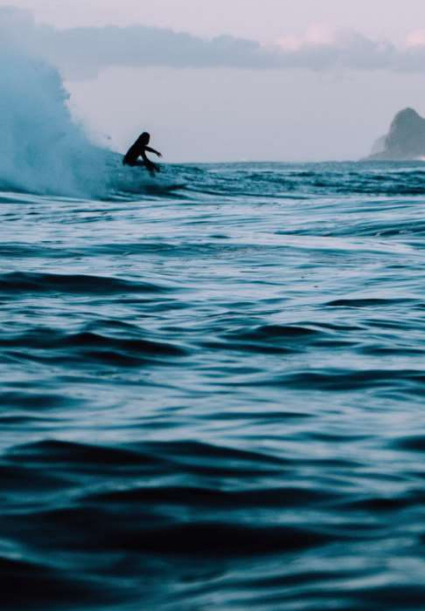

Construction sector performance measurement

Learning lessons and finding opportunities

CASE STUDY
New Zealand agriculture sector

July 2020

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BRANZ Funded from the Building Research Levy

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Project background

This case study is part of a BRANZ-funded project which aims to inform the development of a performance measurement framework for the New Zealand construction sector. In this research we analyse a number of international and cross-sectoral performance measurement systems. In each case study we seek to understand why performance is measured, how and what is measured, how the system is implemented, and how effective the system is at monitoring and driving performance improvement in the sector. We have synthesised lessons from across the case studies to develop guidance for the New Zealand construction sector on how to curate and implement an effective construction sector performance management system.

This is one of the case studies that contributes to this project.

The full report is available at https://www.branz.co.nz/pubs/research-reports/er55/.

Acknowledgements

We would like to thank BRANZ for co-developing this project and funding it through the Building Research Levy. This project demonstrates the Building Levy being applied to better support not only the safety of our buildings but to enhance the wellbeing of the construction sector and the community the sector serves.

We are also grateful for the time and insight offered by industry practitioners, peak body representatives, government officials, and researchers that have contributed to this research. We hope that this project contributes toward a more sustainable and resilient future for the construction sector.

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Case study: Agriculture sector

1. Introduction

Agriculture makes a critical contribution to the NZ economy. It has grown, adapted and innovated in response to changes in markets, technology and Government policy over many decades. As outlined in this case study, performance management and measurement have been part of this change, historically driven by agricultural science with a strong focus on maximising productivity and product quality, with a more recent focus on other considerations, such as environmental and social impacts.

This case study first provides the context of the agriculture sector and the role measurement plays. It then looks at general observations of performance measurement from those interviewed. Third, it looks in greater detail at a specific framework: the New Zealand Sustainability Dashboard (NZSD). Comment is then made on implementation issues and effectiveness before the final section on lessons learnt from the case study.

2. Context

Sector overview

Agriculture in New Zealand is diverse and complex. It has many sub-sectors, each with their own drivers and constraints. These include sheep and beef, diary, deer, goats, pigs, forestry, various forms of horticulture, cropping and viticulture.

The following statistics from Beef and Lamb New Zealand (Beef and Lamb New Zealand, 2019) provide a snapshot of the sector:

- There are over 52,000 farms covering 13,900,000ha of New Zealand's 27,000,000ha.
- Over 90 percent of outputs are exported, and agriculture contributes 59 percent of New Zealand's export earnings.
- Sheep and beef are the most common types of farming, making up 45% of all farms and covering 63% of agricultural land. Over 90% of sheep and beef farms are owner operated.
- Dairying is the second most common farm type and makes up 21% of farms and 18% of agricultural land.
- The growth of the dairy sector has been a significant change since the early 1990's with stock numbers increasing over 70 percent since 1992.
- Between 1990/91 and 2017/18 livestock productivity has increased markedly, including lambs per ewe up 30%, lamb weights up 33%, lamb production (kg/ewe) up 116%. Between 1992-93 and 2017-18 milk productivity (kg milk solids/cow) increased 42%.

There has been a large investment in irrigation over the last two decades. Statistics NZ (*Stats NZ*, n.d.) report most of the irrigated agricultural land is on dairy farms (59 percent in 2017), followed by other livestock farms (17 percent), grain (13 percent), and horticulture (11 percent). The area of irrigated agricultural land in New Zealand increased 94 percent between 2002 and 2017, from 384,000ha to 747,000ha. This area of irrigated land has risen in every region since 2002, however New Zealand's total increase was largely due to the area of irrigated land in Canterbury almost doubling (241,000ha to 478,000ha). Canterbury contains 64 percent of the New Zealand's irrigated land, followed by 13 percent in Otago (*Stats NZ*, n.d.).

A history of innovation and performance management

New Zealand has a long history of agricultural innovation and adaptation to external shocks (MBIE, 2020). This includes changes in technology, ranging from the introduction of refrigerated shipping in the late 1800s through to the information technology revolution that continues today. As an export-based industry, international prices and market access have had a substantial impact on the industry. Britain's joining of the European Economic Community in 1973, followed by New Zealand Government policies during the 1980s to deregulate and remove land development subsidies, price stabilisation schemes and producer boards, necessitated substantial changes in productivity and diversification of products and markets (MBIE, 2020).

Innovation and change have been supported by substantial public and private investment in agricultural science and technology (see, for example, MBIE,2020). Traditionally, this investment centred on enhancing production productivity. More recently, it has begun to address issues such as agriculture related water pollution and greenhouse gas emissions. This has included increasingly sophisticated predictive modelling and methods of measurement and reporting.

Over the last 20 years, there have been significant shifts in expectations regarding the environment and social responsibility from both overseas consumers and the New Zealand public (MBIE, 2020). This has coincided with greater visibility of the adverse effects (such as the degradation of waterways through dairy stock access, sedimentation and nitrification) and the rapid expansion of accessible mass-media communication, especially social media.

While there continues to be a strong focus on more efficient methods of production and the diversification of products and markets, the increasing demand for environmental and social transparency and accountability was identified as both a challenge and key driver for enhancing performance measurement in the sector by those interviewed for this case study.

3. Overview of measurement of performance

Agriculture utilises many performance measurement tools and frameworks. These range from predictive modelling tools used by both farmers and regulators to manage critical inputs (such as water, fertilizer, stocking rates, etc), through to national level performance measures, such as sector contribution to GDP, employment or inflation.

Farm level performance monitoring

In addition to owners' aspirations, buyer or processor quality requirements drive many on-farm practices. Farmers are generally aware of and adapt rapidly to these signals due to the direct impact on profitability. In the case of milk production, for example, this feedback is given daily through milk testing, which provides very rapid feedback to changes such as feed availability or animal health.

Even where production cycles are longer, there are relatively clear measures that can be used to monitor anticipated production results. Cropping, for example, can include pre-planting soil testing, followed by the monitoring of plant health and the application of water or chemicals accordingly.

The following observations were made during the interviews regarding farm level performance measurement:

- The extent of measurement and the use of the resulting data varies greatly. Most farmers understand the primary drivers of productivity for their farms but, like any input, scientific measurement comes at a cost and the extent of its use reflects factors such as farmer aspirations, knowledge, experience, beliefs and risk appetite.
- As farms are biological systems, agricultural performance measurement is complex. Physical differences and farm practices need to be considered. These include location specific variations, such as aspect, slope, soil type and climatic conditions (precipitation, wind, temperature), in addition to aspects that are within the farmers ability to control, such as farm type, stocking rates, animal breeds, crop cultivars, fertiliser and water application, and so on.
- Substantial changes to farm practices tend to be approached cautiously unless there is an immediate problem or issue to be addressed. Changes in practice can be high risk and have lasting effects. For this reason, multiple sources of information are usually sought, including farm advisors, observation and opinions of other farmers, and smaller scale on-farm trials (such as a single paddock), before being rolled out across the farm.
- In general, corporate farms are more likely to utilise measurement to monitor performance, usually with a stronger emphasis on profit maximisation and regulatory compliance. Owner operators are more likely to rely on their experience and observation and be driven by a wider set of aspirations or objectives.

The historical emphasis on measuring economic productivity meant that wider impacts, such as environmental effects, were rarely monitored except to the extent that they affect production. This was aligned to Government economic policies at the time that encouraged the clearance of indigenous vegetation and the drainage of wetlands to increase farm production. Issues such as soil loss were primarily of concern due to the effect it has on production, rather than issues of aquatic sedimentation, for example.

Modern thinking has changed considerably regarding the value of the natural environment. This is increasingly reflected in farm practices and scientific effort. At the farm level, however, direct measurement of outcomes, beyond productivity, remains limited. For example, robust environmental performance measurement is hampered by practical factors such as diffuse pollution sources, lag times, the number of measurements required for reliable analysis, the need for expert assessment or laboratory analysis, and complexity of the underlying natural systems, particularly when measuring factors such as biodiversity.

Instead, at the farm level, there is more commonly a reliance on process or practice measurements as indicators of performance. This includes audited compliance with farm management plans based around accepted good practices, including animal welfare and environmental practices. The development of farm plans relies on predictive models, such as Overseer, which models the impact of farm management decisions on the flow of nutrients through a farm system and generates nutrient budgets that estimate the amount of nitrogen leaching at the root zone, phosphorous surface run-off and greenhouse gas emissions (see https://www.overseer.org.nz/).

In Canterbury, the use of audited farm management plans to regulate environmental performance has been formalised through the Regional Council's regulatory plans and consents. Data collected from this process is used as an input to catchment level modelling and assessed against catchment level water quality measurements taken by the Council.

Buyers, suppliers, processors, distributors and industry associations

Buyers and processors, such as dairy, meat, wool, fruit or crop processors, are a critical link between primary producers and consumers. They have well developed quality standards for their inputs, processing, and subsequent supply chains. Examples include: milk quality (fat and protein levels, the absence of antibiotics or other contaminants), fruit (size, appearance), wool (fibre thickness and length, fleece weight) and meat (carcass weight, fat content, age of animal). As noted earlier, these standards drive many on farm practices.

Buyer and processing standards are now being extended beyond the raw outputs supplied by farmers to include certification of on-farm practices. These, like food quality and safety practices, are subject to certification and auditing by overseas food manufacturers, distributors and retailers.

To support this certification process, growers and processors have invested in systems to monitor on farm performance. These include the use of geographic information systems (GIS), for example, to monitor and track on-farm conditions and processes, such as optimising the application rates of critical inputs, such as water, fertiliser or effluent.

Buyers and producers are increasingly looking to incentivise good performance beyond compliance with regulatory or industry standards by paying premiums for products from farms where practices exceed minimum environmental, animal welfare, and social well-being requirements. See for example Synlait's Lead With Pride (*Synlait*, 2018) or Fonterra's Cooperative Difference (see *Fonterra*, n.d.; *NZX*, n.d.).

Environment concerns have led to farm suppliers, such as fertilizer and irrigation companies, providing predictive tools and advice to support the efficient and environmentally sound use of their products. Supply from irrigation companies usually comes with monitoring and reporting to fulfil their resource consent conditions.

The agricultural sector also has a range of industry associations to support and advocate on their members behalf. These organisations are increasingly providing advice for farmers to support on farm performance enhancement (see *Beef and Lamb New Zealand* (2020) or *DairyNZ* (2019) for examples).

Government

At the national level, there are several Government agencies that collect performance information. Statistics New Zealand collect and coordinate data collection across many aspects of the nation's wellbeing, including agriculture sector performance.

The Ministry of Primary Industries (MPI) has a key role in representing the sector interests, as well as having a regulatory role in matters such as food safety, animal welfare and biosecurity. MPI's reporting appears to remain focused on traditional productivity measurement (see for example NZIER (2013)) or relies on industry organisations, such as Dairy NZ, for sustainability reporting (see *MPI*, n.d.).

The Ministry for the Environment (MFE) has a role in overseeing environmental policy, laws and regulations and monitoring environmental outcomes. Similarly, Worksafe are the lead agency for work place health and safety, with the Accident Compensation Commission also having an active role.

Local government, particularly regional councils, have a critical role in regulating environmental outcomes. Many regional councils were slow to respond to changes in the sector, particularly the increase in dairying since 1990, and this was compounded by the absence of any national level guidance. Water quality and quantity, along with aquatic ecological health, have been the major focus of regional council regulation. As noted earlier, catchment level outcome monitoring is now undertaken and used to inform the development and auditing of farm environment plans as a means of environmental management. The use of farm environment plans allows some flexibility to reflect different circumstances and practices. The need to ensure standards do not suppress innovation or alternative means of achieving beneficial outcomes was a strong theme among those interviewed.

4. New Zealand Sustainability Dashboard (NZSD)

The NZSD is a collaborative research project funded by the Ministry for Business Innovation and Enterprise (see: https://www.sustainablewellbeing.nz/nzsd for more details). Commencing in 2012 the key drivers for the development of the NZSD included:

- providing evidence and credence about sustainability to overseas customers
- addressing the social licence to farm with the New Zealand public
- demonstrating regulatory compliance
- informing on farm continuous improvement.

The summary provided here is drawn primarily from the project's synthesis report (Whitehead et al, 2019). The overall project remains a work in progress in some respects, demonstrating the scale and complexity of the task, as well as the on-going, dynamic and evolving nature of performance measurement and management.

In contrast to many on-farm or organisational performance approaches, the NZSD provides an over-arching framework that can be applied at multiple levels, scales and purposes. This supports the mapping of performance to the sector level as well as tailoring of measurement systems to match the sub-sectors within it.

In recognition that not all measures are equally important to all industries or sub-sectors within the broader agricultural sector, the NZSD framework allows and encourages users to focus on the outcomes, objectives, indicators and measures that are most relevant to their purpose. Given its intention to provide credence to overseas customers, the framework is designed to align with well-established international frameworks. The synthesis report also stresses the importance of linking this back to on-farm practices to enable continuous improvement.

Seven steps

The application of the NZSD framework is based around seven steps, as shown in Figure 1. The seven steps were applied to a variety of sub-sectors to demonstrate its application.

Figure 1: NZSD Seven Steps

Step 1 - Clarification of purpose

The NZSD project identified four drivers of sustainability assessment for the sub-sectors studied: market demands, societal desires, regulatory compliance and business sustainability. There is overlap between these, but the key lesson is that the purpose or key drivers will determine where the emphasis is placed and how it is put into practice. It will determine which outcomes, objectives and indicators and measures are most relevant.

The case studies found different drivers between sub-sectors. For those providing irrigation for example, regulatory compliance was a primary driver. In contrast, the wine and kiwifruit industries were driven by market considerations. Within the wine industry case study, the priorities identified by consumers were different from those that producers regarded as salient.

Step 2 - Prioritisation of action areas

With an almost limitless of range of potential action areas and measurements available, prioritisation is needed to ensure those chosen are relevant and meaningful for that industry or sub-sector. A materiality assessment was used for this.

Materiality was based on the direct or indirect impact on an organisation's ability to create value. This analysis incorporates saliency and risk, checked against stakeholder perceptions and priorities. This ensures the priorities align to customer expectations, as well as being relevant for the farmers or growers. The research team used multiple methods to do this, including the use of choice modelling and 'big data' to identify differences between consumers preferences in different markets.

Step 3 - Selecting indicators, measures and targets

> *"It is fundamentally important that each indicator and its measure(s) are linked directly to a comprehensive and underpinning attainability framework. This locks in relevance, keep focus on the prize, links the information to broader sustainability concepts and emphasises a systems approach to sustainability."* (P24, Whitehead, J., et al, 2019)

The NZSD developed a framework that is closely aligned to the Sustainability Assessment of Food and Agriculture systems (SAFA) framework developed by the Food and Agriculture Organisation (FAO). In developing a framework, the NZSD sought to ensure that:

- It was grounded in the NZ economic, environmental and social context
- Matched international market accreditation requirements (particularly important given the strong export focus of the sector)
- It was scientifically robust.

The NZSD framework, shown below in Figure 2, has four pillars (social, environmental, economic and governance) under which sit 19 outcomes, 54 objectives and 110 indicators. The pillars, outcomes and objectives provide the high-level context and alignment with other measurement systems and perspectives. Further detail on the framework, including the objectives and measures, is available in ARGOS (n.d.).

Not all indicators are relevant to each sub-sector. The framework allows users to select the indicator and develop the specific measures relevant to their operating environment while retaining the connection to the higher level performance objectives and outcomes.

Within this framework, there are three different types of indicator:

- Context indicators that reflect the state or situation within which an enterprise is situated.
- Practice indicators that measure the methods or technologies used. These are established based on strong casual relationships linked to outcomes.
- Performance indicators which measure the actual outcomes.

The NZSD investigated sustainability targets from 12 frameworks in operation around the world. They found most are based on practice rather than performance and the setting of targets was highly contextual. They concluded the assessment frameworks were useful for driving performance within an industry but generally weak as comparative tools between industries, regions or nations.

When selecting measures, the NZSD identify a number of considerations to take into account. These include data availability, cost, consistency and data ownership, governance and sharing issues.

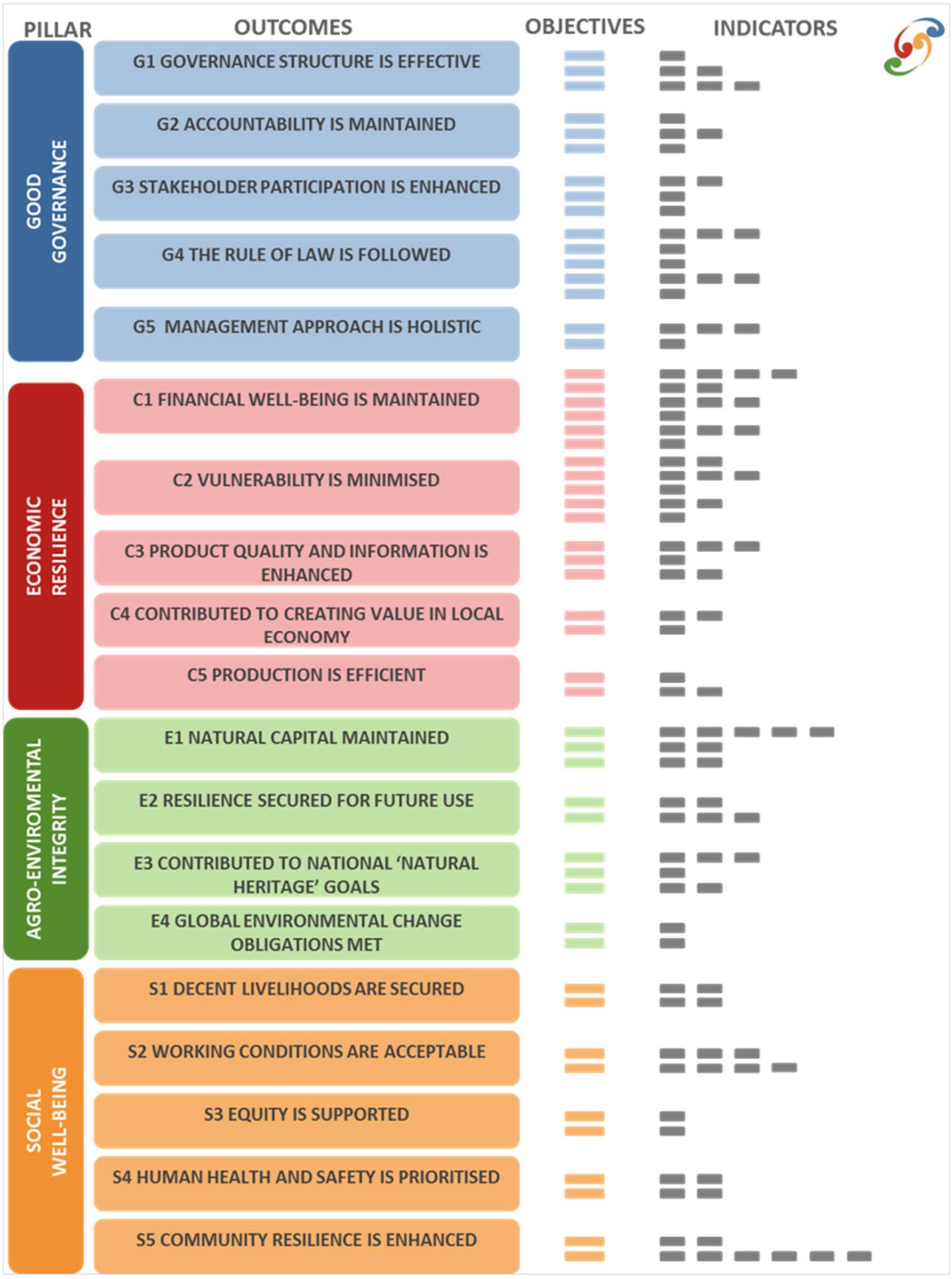

Figure 2: The NZSD framework

Step 4 - Data collection and analysis

The collection and analysis of data remains part of the on-going work in programme for the NZSD. They make the point that collecting the numbers is just the beginning: data must be aggregated, interpreted and presented in a way that allows those involved to understand it and decide what, if anything, is done as a result. They give three examples of software tools developed within the NZSD project this purpose: Delv/Kohuratia (for analysis of the sustainability of Maori organisations), a NZSD Biodiversity Assessment tool and the Zespri Sustainability Assessment tool.

Step 5 - Reporting to participants

Reporting results to participants provides the opportunity to recognise performance, encourage continuous improvement and enhance transparency. It also encourages on-going participation in performance measurement. The NZSD project found the use of benchmarking as particularly useful format of providing information back to participants and encouraging practises beyond regulatory compliance.

Step 6 - Profiling to markets

Credible sustainability profiling is particularly important for New Zealand's agribusinesses. The value of New Zealand's clean and green image extends beyond environmental care and is linked with desirable product attributes such as food safety, quality and nutritional value. Doing this consistently at an organisational, industry and national level, as well as consistency with internationally recognised reporting frameworks, provides a mechanism for capturing price premiums.

The development of the NZSD is on-going. It provides a useful and comprehensive framework that can be applied across the sector and possibly to other sectors. The application of the NZSD allows for prioritisation and customisation of specific indicators and measures to reflect the purpose of reporting and the specific drivers and context of each industry or enterprise.

Step 7 – Evaluation and development

> *"Consumer preferences, market regulations, scientific knowledge and commercial opportunities are evolving continuously. Consequently, sustainability is a journey. An organisation's sustainability programme should be regularly evaluated so that it continues to meet the purposes and adapt to meet new threats and capture new opportunities."* (p47, Whitehead *et al*, 2019)

As part of evaluation and development, Whitehead et al (2019) recommend that: 1) the materiality analysis (Step 2) is conducted periodically to identify changes, issues, or opportunities; 2) an impact analysis is undertaken to assess how measurement is changing the organisation or industry, and; 3) stakeholder feedback is sought to ensure it is suitable to their needs. They also recommend looking at ways to enhance adoption of the measurement system, noting that greater use also enhances credibility and trust. If it is not possible to make its use compulsory in an industry, there may be market mechanisms relating to certification that can enhance adoption.

5. Implementation of performance measurement in the agricultural sector

As noted in the NZSD project, there are a variety of drivers and incentives for performance measurement, including market demands, regulatory compliance, a desire to avoid criticism by the public, as well as owners wanting to improve the performance and profitability of their farms. There are however significant

barriers to implementing scientifically robust performance measurement systems in the agricultural sector. This section provides an overview of these.

Complexity

The multitude of stakeholders, from farmers, processes and the international supply chains to overseas customers, as well as the domestic public, regulators and policy makers. Each of these have their own purposes and perspectives, making performance measurement implementation complicated and sometimes contentious.

The on-farm bio-physical processes and location specific variations, as well as variations in the owners' aspirations, add to the complexity. Investments in science and technology are steadily increasing performance measurement capability but come at considerable financial cost, as well as an investment in time to understand and operate. Those interviewed for this case study reported that many farmers prefer to rely on their own observations, experience and knowledge of their farms, and see relatively little additional value from other methods. For this reason, they are reluctant to invest in additional performance measurement beyond what is required from processors or regulators.

The breadth of measurement requirements and performance improvements also adds to the complexity. In addition to production and the natural environment, there are some other areas where performance management is required. Animal welfare, for example, has long been recognised as important by the public and consumers, as well as farmers themselves. The certification of this is increasingly expected by overseas consumers.

Similarly, health and safety has been an area of focus by Government agencies and subject to targeted policy interventions. The general approaches used are not unique to agriculture but specific risks, such as the use of quad bikes, have been highlighted and subject to specific campaigns and regulation, supported by accident data through the health system and Accident Compensation Commission (ACC).

Similarly, changes to workforce composition are documented through tax and other systems. This includes the use of migrant labour and there have been targeted efforts to ensure employment practices are sound.

Meaningful benefits and relevance to users

Performance measures work best when they are relevant to users. Farmers will do what is needed to comply with processor certification for markets or regulatory compliance, but these provide little incentive to undertake extensive performance monitoring or explore alternative practices. Instead, farmers rely more heavily on their own knowledge, observation and past experiences when deciding what is worth doing. Unless there is a problem or emerging opportunity, there is often little incentive (and sometimes considerable risk) in changing practice. This applies as much to adoption of potentially costly monitoring methods, as well as other farm practices.

Data use, ownership, governance and sharing

Interviewees for this case study identified several issues regarding the use of data. The sector has invested heavily in technology to aid the collection and sharing of data cheaper and easier. However, information is valuable and can be a point of difference between competitors. This applies to the systems and technology used to collect and share information, as well as the information itself. Various forms of commercial sensitivity can be a barrier to data collection and sharing.

Among many farmers, there is a reticence to share information about their farm performance. In the past there have been examples of data collected for public scientific investigation and monitoring purposes

(such as ecological surveys) being subsequently used to develop stricter regulatory controls, sometimes disadvantaging those who have willingly participated compared to their peers who did not participate. This has eroded trust between farmers and regulators and is part of a wider issue regarding the lack of incentives to share information or manage farm practices manner that protects or enhances values that may be regarded as public goods.

For a variety of reasons, individuals can also be reluctant to share performance information with their peers, the public or commercial interests in a form that identifies them personally. The use of benchmarking was referred to by those interviewed and by the NZSD as a possible approach to mitigate this barrier.

Behavioural change limitations

Performance measurement, and the implementation of changes resulting from measurement, requires doing things differently. This is not just a scientific or functional process; it requires behavioural change in both the development of measurement processes and the operational changes that are identified as a result of measurement.

Behavioural science adds additional insights beyond the practical or commercial difficulties in establishing good practice and measuring performance. Behavioural science emphasises the decision-making *process* and the many psycho-social contextual influences that determine decisions and behaviours. This includes the limitations of what is frequently described as rational decision making, even when good information is available.

Behavioural science has a long history in agriculture, dating back to disastrous agricultural practices on the plains of the American South and Midwest during the 1930s, known as the Dust Bowl era, which subsequently led to the development of extension services to improve agricultural practices (Rogers, 1983). Research across multiple industries, nations and decision-making contexts of all types have reinforced and expanded this body of knowledge. Among other things it emphasises the decision context, communication methods, past experiences, perceived need for change, and socially based norms. It remains as pertinent to understanding innovation and change now as it did in 1930's America, particularly where decisions involve uncertainty, risk or substantial investments of money and time.

Some simple examples given by those spoken to in this research include:

- The importance of socially defined norms in determining practices
- The need to establish trust and credibility when advocating change
- The importance of the socially defined concept of fairness in determining behaviour or expectations of others. (In relation to actions that have a collective benefit, rather than individual benefit, this can be reflected in statements such "Why should I do this when others haven't?" or alternatively, "You need to do your bit because everyone else has done theirs. You're letting the team down"
- An example of some dairy farmers focusing on maximising milk production when there was evidence to suggest this was detrimental to profit
- The effectiveness of benchmarking as a performance management tool, highlighting the normative social context: no-one wants to be below average and those above it take pride in their achievement.

There has been substantial progress in performance measurement, including environmental and social outcomes, in the agricultural sector. There is, however, still some way to go with the above factors indicative of the barriers to better monitoring and reporting in the sector.

6. Effectiveness

In terms of production, the agriculture sector's measurement systems are generally well developed and effective. They are based on many decades of investment in agricultural science and innovations have been widely, although sometime gradually, by most farmers. There have been sustained productivity improvements over a long time and the sector has remained generally profitable despite large external shocks, including changes in market access and consumer tastes, prices and exchange rates and domestic policy settings.

The performance measurement systems have been most effective when there are clear benefits and relatively short feedback cycles. While innovations are not immediately adopted by all farmers, the production supply chains have driven on-farm changes through quality standards and farm gate prices.

With a strong traditional focus on production, the increasing environmental expectations by both overseas consumers and the domestic public caught the sector on the back foot. This is particularly visible in the dairy sector where environmental degradation has been highly visible and regulatory mechanisms slow to adjust to the rapid growth.

There is now substantial investment being made to improve environmental performance and measurement systems, driven by markets, regulatory compliance and adverse domestic publicity. For the reasons outlined early, progress in some areas has been slow and reversing the environmental damage will be difficult, if not impossible in some areas. Comprehensive measurement systems that inform on-farm practice, regulatory compliance and provide an overall picture of the sector, remain limited.

The NZSD project highlights that a broader set of performance indicators is feasible, extending beyond both production and the natural environment to include governance and social performance. It is, however, still relatively early days in that process.

7. Summary of lessons

The lessons regarding performance measurement from the interviews and research for this case study include:

- **Be clear on the purpose**. The purpose and drivers of performance will determine what is measured and how it is used. This may be different between sub-sectors, reflecting the differences in the drivers of change and the way they operate.
- **Having a framework provides context and relevance**. Being able to align individual measures to a wider context enhances understanding and meaning.
- **It is a journey not a destination.** Things change and new pressures emerge. Start small and grow over time. Do not expect perfection, focus on what is material and be pragmatic.
- **Recognise and accommodate diversity.** Uniform standards can stifle innovation and put the focus on compliance, rather than the outcomes. At the enterprise or project level, performance indicators need to accommodate the specific circumstances. As one interview said, "universal standards dumbs it down". A strong and absolute compliance focus, rather than relative measures, can be counter-productive and discourage improvement beyond minimum standards.
- **Keep site of the outcomes.** Ideally, the metrics will measure the outcomes. However, this be difficult, costly and introduce considerable lag times. If necessary, practice indicators may be used

where there is a strong link to outcomes. When doing so, care needs to be taken to avoid inflexibility that stifles innovation or the use of different practices that are more applicable to the specific context.

- **Involve users.** Indicators and measures must be relevant and inform practice. Involving users in the development process increases the likelihood of achieving this.
- **Performance measurement is a behavioural process, as well as a functional process.** The role of behavioural science in developing and deploying performance measurement processes extends beyond the involving users to ensure the measures are functional and relevant. There is an extensive body of literature on the psycho-social and cultural aspects of decision making, including unconscious biases and normative assessments that influence decisions and subsequent actions. These include how information is presented, disseminated, evaluated and used, including aspects such as trust and credibility. This extends to the way indicators are presented, as well as the process for developing them
- **It is hard and slow, but achievable.** The key performance measures for the agricultural industry are production-based measures developed over decades. Responding to new demands, such as the focus on environmental impacts, is slow and incremental but progress is being made.

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