



Examining The Progress Towards Sustainability Within The New Zealand Fresh Produce Industry

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1. INTRODUCTION

This practicum report focuses on how my work is progressing sustainability and the Sustainable Development Goals (SDGs) in the Fresh Produce industry, via my work for United Fresh New Zealand Inc. (United Fresh), particularly within the Technical Advisory Group (TAG). This work has occurred over the 2017-2023 period, with a particular focus on the work performed in late 2022 to mid-2023.

1.1. Contextual Background

My chosen topic for this report is my work for United Fresh, New Zealand's pan-produce industry body, which has been supporting, promoting, and representing the fresh produce industry in New Zealand for more than 30 years (United Fresh, n.d.-a). I will examine how this work has contributed towards achieving the SDGs within the New Zealand fresh produce industry represented by United Fresh. For the purposes of this report, *"fresh produce"* refers to fruits & vegetables, from growing, through harvest, packing, processing, wholesale, and retail stages of the supply chain.

With the release of the "2030 Agenda" in 2015, the United Nations General Assembly announced the 17 Sustainable Development Goals (SDGs), and 169 associated targets, which:

"Seek to build on the Millennium Development Goals and complete what they did not achieve... seek to realize the human rights of all and to achieve gender equality and the empowerment of all women and girls... They are integrated and indivisible and balance the three dimensions of sustainable development: the economic, social and environmental. The Goals and targets will stimulate action over the next 15 years in areas of critical importance for humanity and the planet". (United Nations, 2015)

These SDGs are broad reaching, and "of critical importance for humanity and the planet," (United Nations, 2015), and cover a variety of topics, from clean water to education, and gender equality to sustainable production & consumption. Each goal covers a distinct area within the overall agenda, and which require:

"the framework of a revitalized Global Partnership for Sustainable Development," which the United Nations "call upon all businesses to apply their creativity and innovation to solving sustainable development challenges."

Whilst the overall scope of the SDGs is broad, I have chosen for the practicum report to focus on SDG 9 and 12, and targets 9.1, 9.4, and 12.2.

I chose these particular SDG and targets, as they represent to me a core aspect of the SDGs to which the New Zealand fresh produce industry has worked, and in which the industry can demonstrate progress on the SDGs. I have listed the SDGs, and their associated targets, in Table 1.

SDG and SDG Target Descriptions (United Nations, 2015).	
Selected SDG Descriptions	Selected SDG Target Descriptions
SDG 9:  Image 1. SDG 9. (From Wikimedia Commons, https://upload.wikimedia.org/wikipedia/commons/thumb/1/13/Sustainable_Development_Goal_09_Industry.svg) <i>“Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation.”</i>	Target 9.1: <i>“Develop quality, reliable, sustainable and resilient infrastructure, including regional and transborder infrastructure, to support economic development and human well-being, with a focus on affordable and equitable access for all.”</i> Target 9.4: <i>“upgrade infrastructure and retrofit industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes, with all countries taking action in accordance with their respective capabilities.”</i>
SDG12:  Image 2. SDG 12. (From Wikimedia Commons, https://upload.wikimedia.org/wikipedia/commons/thumb/6/65/Sustainable_Development_Goal_12_ResponsibleConsumption.svg/) <i>“By 2030, achieve the sustainable management and efficient use of natural resources.”</i>	Target 12.2: <i>“achieve the sustainable management and efficient use of natural resources.”</i>

Table 1

Within the context of my practicum report, each target represents a separate way in which I have worked with other team members of United Fresh, in supporting the sustainability efforts of the fresh produce industry:

- Target 9.1 relates to the industry working to achieve the SDGs as part of a holistic and integrated approach, within New Zealand and globally, as part of national or global partnerships that are not industry or country specific.
- Target 9.4 relates to the industry's efforts to achieve internal sustainability, with aspects focused on the fresh produce industry production and processing steps, such as the equipment, processes, and resources used.
- Target 12.2 represents the sustainable management of the environmental and physical resources required by the industry to be able to grow food, and the efficiency of their use.

1.2. Rationale and Problem Statement

With the SDGs now approaching almost 8 years since their September 2015 announcement, it might be expected that progress towards achieving these is well underway, given that around half of the timeframe in which they were to be achieved has now passed.

However, it is acknowledged by many reports that implementation of the SDGs has proven problematic, and further transformations in order to achieve the SDGs are required (Allen, Metternicht, and Wiedman, 2018; Herrera, 2019; Lafortune & Schmidt-Traub, 2019; Henderson & Loreau, 2023). In order to meet the SDG targets by 2030, Shulla and Leal-Filho's report (2023) to the European Parliament identified that context-specific challenges exist that slow progress on the SDGs, including *"trade-offs; capacity building; technology and data; as well as cultural issues"*. These challenges need to be mitigated for sufficient progress to resume.

Focusing on individual SDGs, Henderson & Loreau's Report further identified that SDG 9 requires a more localised and directed approach, compared to the wider scale SDGs such as climate change. A lack of progress towards SDG 9 has also been identified as a contributor to food waste and loss (De Boni, Ottomano Palmisano, De Angelis, and Minervini, 2022).

When discussing SDG 12, Philippidis et al (2020) identified that trade-offs could occur between economic focused and bio-sphere focused SDGs, and focusing on one set would inhibit the other.

Given these challenges, it can be seen that the barriers to achieving SDG 9 and 12 are not only those of the surrounding environment, but also in enabling appropriate implementation to succeed, not only at SDG level, but also within the level of individual targets, including 9.1, 9.4, and 12.2, which are the focus of this practicum report.

These challenges are recognised by the New Zealand Government as significant challenges in achieving the SDGs (Ministry for the Environment, 2022), as well as by both United Fresh and myself in our sustainability work. I have been working on implementing activities to progress the SDGs since

2017, both in New Zealand, and within the Pacific, and have first-hand knowledge of the difficulties in implementing sustainable infrastructure and resource efficiencies required to achieve 9.1, 9.4, and 12.2.

These difficulties have shaped my professional work with United Fresh, and has been the impetus for several of my more recent activities, including the publication of a set of industry guidelines (Maurer, Lawes, and Inacio, 2023), and ongoing engagement with industry members and multiple government departments. These efforts were intended to assist the fresh produce industry, and its regulators in developing strategies and processes for mitigating the challenges identified.

As such, the issue which my practicum report will focus on is:

“how achieving a sustainable and resilient fresh produce industry in New Zealand has progressed via my work for United Fresh, and whether the industry faces further challenges in progressing targets 9.1, 9.4, and 12.2?”

1.3. Aims and Objectives

Looking at the specific context of the SDG related sustainability efforts of United Fresh, my practicum report is intended to provide an in-depth examination of my recent United Fresh work I in progressing the SDGs. It will focus on how this work has assisted progress towards SDG targets 9.1, 9.4, and 12.2, within the New Zealand fresh produce industry.

This report, and its findings, are intended to assist in expanding the conversations around the achievement of SDGs 9 and 12 from a commercial/industry viewpoint, and the practicality of targets 9.1, 9.4, and 12.2 in the industry’s efforts. In sharing what successes have been achieved, and the challenges faced in progressing this work, I hope that this report, and my experiences, enable others to identify their own pathways towards achieving these SDGs and targets within their own contexts.

In order to be able to examine my work against the targets, the following objectives were set:

1. To critically reflect on how United Fresh’s TAG has achieved success in implementing the principles of the SDGs into its work of implementing sustainability activities for the New Zealand fresh produce industry.
2. To analyse the challenges faced by United Fresh in its efforts towards progressing the SDGs for the Fresh produce industry.
3. To explore the relevant opportunities that United Fresh has created in the process of its SDG work, which have enabled further work towards achieving the SDGs.
4. To reflect on my position in the advancement of sustainability for the fresh produce industry over the last 6 years, and how my future activities may build on the success achieved for the industry, both within New Zealand, and globally.

1.4. Practicum Placement – The Location

My Practicum placement is based around my role as Projects Manager for United Fresh's Technical Advisory Group (TAG). I have held this position, as well as two other positions within TAG, since 2017, with these positions being primarily desk-based in Auckland.

United Fresh is an Incorporated Society, which acts as New Zealand's sole pan-produce industry body, supporting, promoting, and representing the fresh produce industry in New Zealand for more than 30 years (United Fresh, n.d.-a). The fresh produce members represented extend from:

“seed producers, growers, packers, wholesalers, marketers, importer/exporters, transporters, retailers, fresh cuts and service providers that integrate all segments of the fresh produce industry” (United Fresh, n.d.-b).

United Fresh membership is currently around 94 members (United Fresh, n.d.-c). United Fresh's vision is *“creating a sustainable fresh fruit and vegetable industry for New Zealand,”* which it will achieve via the mission of *“connecting the fresh fruit and vegetable value chain by providing services and representation to industry”* (United Fresh, n.d.-d).

The United Fresh Technical Advisory Group (TAG) was set up in 2018 (United Fresh, 2023-c). TAG's objective is to support members in crucial areas impacting the fresh produce industry, both currently, and into the future, in a sustainable manner.

As part of its work in achieving the goal of sustainability for the industry, United Fresh has adopted the SDGs, which forms part of the work performed by TAG (United Fresh, n.d.-e).

TAG consists of a core team of approximately 5-7 at any one time, split between 2 locations in Auckland. The core team does not work on TAG activities full time, but work on TAG activities on an as needed basis. This core team consisted of the following team members at certain points during 2023 (personal communications, 2023):

- Dr Hans Maurer (Chair)
- Paula Dudley
- Stephanie Wrathall
- Carmel Ireland
- Anne-Marie Arts
- Jacob Lawes
- Tiago Inacio

This core team is able to access additional technical expertise from staff of United Fresh members, where this expertise is deemed necessary for delivery of the technical aspects of TAG activities. This is determined on a per-project basis, and typically occurs 1-3 times per year. Non-technical support, such as directed information gathering, report writing, general administration, data entry, and documentation proofing, is provided by other United Fresh staff on an as-needed basis.

Each core team member has been delegated responsibility for technical lead of individual topics, based on their individual industry experience and scientific expertise (personal communications, various). My delegated areas of responsibility for 2023 in which I act as the technical expert for United Fresh include:

- Sustainability, and the SDGs.
- Climate Change.
- Industrial Gases.
- Submissions to Government ministries, statutory bodies, and Parliament Select Committees.

The method by which TAG work is commissioned is detailed in Section 2.2, where I examine the process by which work is commissioned as a framework under which a critical analysis of the work against the SDGs may be possible.

1.5. Practicum Placement – My Role

In my current role, I act to manage the ongoing work of TAG in a variety of sustainability related topics, including, but not limited to:

- Biosecurity.
- Industrial Gases.
- Regulatory Compliance.
- Packaging and Transport (boxes, crates, palletisation, and transport of product).
- Food Safety.
- Representation of New Zealand on the Sustainability Committee of the International Federation for Produce Standards.
- Traceability/Data Management.
- Industry Communications.

My main tasks as the Projects Manager are to:

- Coordinate and direct the activities of the TAG team in delivery of active sustainability work, including research, analytics, delivery, and reporting. This includes working with individual TAG team members to identify and scope projects and deliverables from a cost, time, and output basis, financial management and work tracking, project resourcing, and document review.
- Oversee the preparation of communications to industry in the form of technical brief newsletters, informing industry of sustainability efforts and ways in which they can implement sustainability efforts. This involves topic research, report/newsletter writing, document review and editing, and coordination of the TAG team to ensure communications are technically accurate, informative, and published on time.

- Identify opportunities for the development of sustainability activities that could be implemented by United Fresh, and to create a realistic framework by which the work could be implemented. This includes research, project scoping, writing and presentation of project proposals to United Fresh Management, and development of implementation frameworks, once projects are approved.
- Communicate the completed and in-progress work to industry, via webinars, presentations, and conference meetings, to educate and inform of the opportunities available to individual businesses within the industry to implement the SDGs. This involves the development of technical presentations in partnership with the appropriate TAG technical expert, coordination of presentation resourcing, managing presentation delivery by the appropriate TAG technical expert, and engaging with United Fresh members to answer technical questions that arise as a result of the information presented.

My practicum work specifically focuses on my work for TAG, with a primary focus on the work performed in late 2022 - 2023, supported by the secondary focus of work started/ completed prior to this time, which formed the foundation for some of my later work.

Some of the more recent work completed, that illustrates how United Fresh has been implementing SDG theory into practical outcomes, includes industry communications & engagement on the SDGs at the New Zealand Horticulture Conference 2023 (Image 3), and the publication of industry guidelines on implementing the SDGs in a fresh produce specific framework (Maurer, Lawes, and Inacio, 2023). These guidelines have also resulted in ongoing engagement with industry and government to discuss pathways towards implementation (personal communications, various).



Image 3 (From United Fresh LinkedIn Post, 2023. https://www.linkedin.com/posts/united-fresh_hortconf2023-unitedfreshnz-tagnz-activity-7092621050181550081-n5AH)

1.6. United Fresh Alignment to Selected SDG Targets

As each discrete piece of work completed within the scope of the practicum tends to align with all three targets, it is helpful to analyse the general alignment of United Fresh's sustainability work with the individual targets that will be discussed in the practicum report.

The specific breakdown of individual work completed, and my role in this work, is examined in detail in my critical analysis of the work completed.

SDG 9 and United Fresh Alignment	
Problem Statement: The New Zealand Fresh Produce industry, via the pan-industry body United Fresh, and its Technical Advisory Group (TAG) has adopted the United Nations Sustainable Development Goals. However, it has proven challenging to align industry Sustainability efforts into implementing sustainable and resilient infrastructure. The industry needs to implement frameworks and tools that support the SDGs, to be able to better meet targets 9.1, and 9.4.	
SDG Targets	Alignment with Organisation
Target 9.1: <i>“Develop quality, reliable, sustainable and resilient infrastructure, including regional and transborder infrastructure, to support economic development and human well-being, with a focus on affordable and equitable access for all.”</i>	• United Fresh's Vision is the creation of a sustainable fresh fruit and vegetable industry for New Zealand. As the only pan-produce industry body, it works towards this goal by providing services and representation to industry, including technical advice, representation to government, and industry communications, focused on enabling the industry to build a sustainable and resilient fresh produce supply chain. (United Fresh, n.d.-b) • The New Zealand produce industry involves staff and businesses across both rural and urban New Zealand, from North of Kaiataia, all the way down to the Bluff. New Zealand fruit & vegetables are exported globally, feeding millions globally. The industry has a focus on supplying nutritional food that supports health and well-being. Given this, United Fresh believes it important that the New Zealand Fresh produce industry

	supports healthy lifestyles via diet, safe workspaces, and a sustainably focused environmental management programme that attempts to reduce or prevent climate change and environmental damage that has negative impacts on all New Zealanders. (personal communications, various)
Target 9.4: <i>“By 2030, upgrade infrastructure and retrofit industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes, with all countries taking action in accordance with their respective capabilities.”</i>	The New Zealand fresh produce industry has experienced significant disruptions between 2020-2023 due to pandemics, labour shortages, floods, storms, droughts, and increasing regulations that mandate sustainability. Given this, United Fresh is seeking to help guide the fresh produce industry towards developing more sustainable and resilient supply chain systems for fruits and vegetables, with improved resource efficiency, as well as transitioning away from fossil fuels for heating and agri-chemical production, due to the increased risks, costs, and impacts of traditional production methodologies. (personal communications, various)
SDG 12 and United Fresh Alignment	
Problem Statement: Overuse and inefficient use of resources, both in production and consumption of fresh produce, causes significant unnecessary stress on the environment, and pushes us closer to, or further beyond, the Planetary boundaries. Full systemic change is required by industry, in order to achieve SDG 12.2, to manage the efficient use of natural resources.	
SDG Targets	Alignment with Organisation
Target 12.2: <i>“By 2030, achieve the sustainable management and efficient use of natural resources.”</i>	Clean water, healthy air, and soil are required to grow fresh produce in the quality and quantities necessary to support the current and future demands of domestic, and global consumers of New Zealand fruits & vegetables. Managing the use of natural resources such as these effectively is therefore critical to ensuring the industry is able to continue producing healthy food in the coming years. (personal communications, various)

Table 2

2. Analytical Framework Development

Prior to examining the outcomes of my work for TAG, and how this has progressed the SDGs, it is helpful to first examine the theoretical framework surrounding the SDGs. My work was developed within this framework, as well as being shaped by the framework of pre-existing knowledge within the fresh produce industry.

I note that a significant portion of the industry knowledge discussed here has become available to myself via commercial undertakings for United Fresh. As such, many of these documents, conversations, presentations, emails, and other media cannot be made available, due to the commercial and sensitive information that is contained. However, the broader strategic aspects raised within these can still be discussed, as that generalised information forms freely shared information within the New Zealand fresh produce industry.

This theoretical framework is therefore separated into two parts:

- firstly, examining the science-focused literature relating to assessing the SDGs with data driven , working from the system as a whole down to the individual SDGs; and,
- secondly, assessing the governance & legislative frameworks under which I worked for United Fresh.

In theory, the combination of the science, and governance & legislation, that will generate my overall framework of how I will be assessing the progress of my work.

This enables me to critically reflect on not only the theory of implementation compared to the practical realities of implementation, but also to examine the commercial and business rationale behind actions taken to implement the SDGS. This is particularly important with regards to my work, as the decisions being made must reflect the underlying realities of the industry.

2.1. The Scientific Framework Approach

A critical examination of individual SDG targets requires firstly examining the available scientific literature related to the implementation of the SDGs as a whole. Only once the wider implementation is understood can an individual SDG target be analysed within the SDG holistic framework. The need for this holistic approach is discussed in a 2015 report to the United Nations (Le Blanc, 2015), which notes:

“The proposed goals and targets can be seen as a network, in which links among goals exist through targets that explicitly refer to multiple goals.”

This is further supported by Miola and Schiltz (2019), who identified that, out of 107 analysed targets:

“60 explicitly refer to at least one other goal than the one to which they belong. 19 targets link three goals or more. Such targets create indirect, or ‘third party’ links among goals.”

This linkages between the SDG targets is further discussed by Kanie and Bierman’s (2017) analysis of the development of the SDGs:

“The Sustainable Development Goals were identified in a political process with no higher-level formal conceptual framework”,

Le Blanc also supports this position, noting that:

“The resulting network and mapping, which reflect the results of negotiations in an intergovernmental context, can be thought of as a “political mapping” of the sustainable development universe, as opposed to, for example, a mapping purely based on natural and social science insights about how the system works... SDGs seen through this lens are unequally connected, with some goals being connected to many other goals through multiple targets, while other goals are weakly connected to the rest of the system.”

Given these statements, as well as the core concept being acknowledged and discussed by multiple authors (Mioloa and Schiltz, 2019; Kanie and Biermann, 2017; Beyne, 2020), it is therefore important my analysis and reflection considers not just my targets individually, but how they support the SDG framework as a whole.

2.1.1. Individually Assessing SDGs 9.1, 9.4, and 12.2

With the need for a holistic framework identified, it is now possible to examine the framework of how, in general, SDG 9 and 12 might be assessed, and in particular, how my chosen targets can have progress be empirically measured.

An initial examination of the literature reveals work such as Thore & Tarverdyan (2021), Janoušková, Hák, & Moldan (2018), or Schmidt-Traub et al (2017), as potential considerations for beginning at a strategic level of the SDGs. Using these works, it should be possible to then build to more targeted frameworks to identify individual SDGs and targets.

However, these works show the difficulty in this approach. Thore & Tarverdyan discuss how in attempting to be able to accurately measure individual SDG progress for a given overall outcome (in their example, individual wellbeing), *“picking and choosing”* of relevant SDGs and targets is required.

Janoušková, Hák, & Moldan go further, and note that:

“some indicators... are not intuitively understandable in terms of meaning, interpretation, or relation to other indicators and objectives”, and that “some indicators are not methodologically comparable or have low information value on/for some countries..., are irrelevant..., or are not unambiguously interpretable”,

which leads to their argument that:

“without a procedurally well-designed, conceptual indicator framework for selecting and/or designing indicators, the results of SDGs assessments may be ambiguous and confusing.”

Schmidt-Traub et al’s work also supports the findings of Thore & Tarverdyan and Janoušková, Hák, & Moldan (2018). They discuss that simple numerical outputs of composite indices based on multiple targets or SDGs have weaknesses in design, as well as in the selection of data and data sets used to calculate output scores.

Given these findings, I conclude that attempting to use a holistic SDG assessment tool as a basis for assessing 2 SDGs and three targets, as they relate to a single industry, not a useful starting point. I therefore then transitioned to examining frameworks that were SDG or target specific, to attempt to identify more appropriate assessment frameworks.

2.1.2. A Framework for Assessing SDG 9 as a whole

Beginning at SDG level, assessment of SDG 9 as a whole is simplified by the prior work of Kynčlová, Upadhyaya, & Nice (2020), who developed an “SDG 9 Index” for assessing individual countries progress towards SDG 9.

However, when discussing the data that forms this indices, the authors do note that the scoring is based on country-wide measurements. This, in addition to the fact that the SDG 9 index has a single score for each country, based on the performance against all SDG 9 targets and indicators, makes it unsuitable for use in assessing individual targets and the associated indicators. Given this, alternate models need to be considered. I therefore conclude that I must assess SDG 9.1 and SDG 9.4 as standalone targets.

2.1.3. A Framework for SDG 9.1

I began my research into assessing SDG 9.1 as a standalone Target, via evaluating the work of Xu, Bai, and Chen (2019). They had attempted an initial examination of SDG 9.1, to measure progress against the single target. Their work was able to identify several indicators of progress for SDG 9.1, however, a critical examination of what indicators were identified reveals that these would be inappropriate in attempting to measure progress of a single industry, which does not align with my needs. The 5 indicators for SDG 9.1 identified by Xu, Bai, and Chen are:

- Road density.
- Residential access.
- Accessibility.
- Passenger and freight volumes.
- Total postal business.

All 5 indicators are discussed in their work as being regional and/or national level measurements, intended to evaluate the transport infrastructure as a whole.

Further research did identify other papers that also attempted to create assessments for SDG 9.1, but these too were aimed at national infrastructure level. (Jia et al., 2020; and Illie et al., 2019), The official United Nations indicators also only focus on *“Proportion of the rural population who live within 2 km of an all-season road”* and *“Passenger and freight volumes, by mode of transport”* (United Nations, 2015).

This gap in the indicators and assessments for assessing individual industries, and for assessing sustainable and resilient infrastructure development under SDG 9.1 shows the difficulty in attempting an assessment not linked to the official indicators in scientific literature. Therefore, a framework-based SDG 9.1 and the United Nation’s indicators is not appropriate for my analysis, and I must consider alternate methods of assessing SDG 9.1.

Setting aside SDG 9.1, this still leaves SDG 9.4 and 12.2 to consider.

2.1.4. A Framework for SDG 9.4

As a result of my difficulties in identifying an appropriate framework for SDG 9.1, I returned to the United Nations SDG official framework (United Nations, 2015). I attempted to assess the official indicator, 9.4.1, *“CO₂ emission per unit of value added”*, and its appropriateness.

The official indicator is, in my view, not sufficient to adequately build a framework for assessing SDG 9.4 against in general, given that SDG 9.4 is:

“By 2030, upgrade infrastructure and retrofit industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes, with all countries taking action in accordance with their respective capabilities”.

While a useful metric in some capacities, my work over the last several years has involved examining multiple systems by which sustainability could be implemented and achieved within the fresh produce sector. Of this work, none of it was directly focused on *“CO₂ emission per unit of value added”*, but often related to entirely separate topics and measures. A small selection of the outputs related to my work include:

- Tracking and managing food to reduce food loss (United Fresh, 2021)
- Examining methods by which the use of plastic could be reduced in the fresh produce industry (Maurer, Arts, and Lawes, J, 2020).
- Submitting on the replacement of industrial gases with multiple use-cases, with more environmentally friendly alternatives (Lawes & Maurer, 2018; Lawes & Arts, 2019-a; Lawes & Arts, 2020; Lawes & Maurer, 2021).

- Consulting on developing a long-term industry transformation plan, which would develop the fresh produce industry in a manner consistent with the SDGs (Maurer & Lawes, 2023).
- Consulting on developing a more efficient emissions trading scheme management system (Lawes, Baptist, and Maurer, 2023).

Given that the sole official indicator does not cover this sustainability work of United Fresh and myself, despite our objective of supporting the fresh produce industry sustainability efforts, which fits within *“increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes, with all countries taking action in accordance with their respective capabilities”*.

Therefore, I find that the single United Nations indicator for SDG 9.4 is wholly insufficient to accurately assess sustainability of the New Zealand fresh produce industry.

The depth to which I, and other members of United Fresh, have discussed *“resource efficiency”* with regards to plastic packaging, transport, labelling, and agrichemical use with both industry and government (Confidential Internal Memos, see as examples, 12 May 2020), has been significant over the years. So too, has *“environmentally sound technologies and industrial processes”* in areas such as water usage, environmentally friendly pest & disease management, and food safety (United Fresh Member Updates, see as examples, March 2023). Yet, despite being within what should nominally be the scope of SDG 9.4, these are not able to be measured by the single official indicator.

As with SDG 9.1, I conclude that a framework based on the official indicator will be insufficient.

2.1.5. A Framework for Assessing SDG 12 as a Whole

Moving back up to the SDG level, the work by Talma (2019) in assessing SDG 12 in the corporate environment finds that multiple sets of authors have identified problems in attempting to use quantitative data to assess SDG 12. Talma finds that:

“the simplification brought by quantitative indicators is misleading as they do not represent the true, deeply transformative values of the goals and their associated sub-targets, but also fail to put into the place the politics behind the targets” (Talma, 2019).

Talma’s position is supported by the work of Elder and Olsen (2019), who note that:

“The environmental goals and targets, like most of the others, lack some elements of being SMART (specific, measurable, achievable, realistic and time bound), which was a key initial concept of the SDGs.”

Elder and Olsen also find that:

“Overall, the story of the indicators is about diluted targets and missed opportunities. The indicators appear to significantly weaken the environmental elements of the SDGs and restrict the scope of many targets. Moreover, although many indicators are narrow, they still do not

have established methodologies or much available data”,

And that:

“SDG 12 is somewhat disappointing. The indicators for about half of the targets seem appropriate, but the scope of the other half is too narrow.”

Given these findings surrounding broader measurement of the SDGs, and SDG 12 in particular, I therefore assess that attempting quantitative measurement of SDG 12 at a broad level, as part of assessing target 12.2, would be inadequate. A more directed framework approach is required.

2.1.6. A Framework for SDG 12.2

With existing frameworks not appropriate for examining SDG 12 at a high level, I turned to attempting a focused examination of SDG 12.2, *“By 2030, achieve the sustainable management and efficient use of natural resources”* (United Nations, 2015). This has two official indicators, 12.2.1 *“Material footprint, material footprint per capita, and material footprint per GDP”* and 12.2.2, *“Domestic material consumption, domestic material consumption per capita, and domestic material consumption per GDP”*.

A first principles approach suggests these definitions mean that the indicators should be appropriate for my analysis. However, if an appropriate framework for establishing quantitative measurement within the fresh produce industry does not exist, I will be unable to assess progress, except in a qualitative manner.

Examining the assessment frameworks for SDG 12.2, Trummer, Ammerer, and Scherz (2022) discuss how the indicators for 12.2 can be assessed in a quantitative manner. It is therefore possible to attach a quantitative assessment to 12.2. However, their work focused on mineral extraction and refinement, and in order to adequately measure the progress towards sustainability, they found it necessary to subdivide the indicators into 18 separate measures. This was also noted only as a theoretical framework, and that implementation of these measures into an assessment system, had yet to occur. Finally, they also note that parts of this work are Austria centric, and the framework may not be fully transferable to other countries or industries.

Varham et al. (2019) suggest that an *“Environmental Footprint”* may be a useful quantitative assessment tool for measuring the impact of human activities in given areas. This has indeed been shown to be practical within the fruit & vegetable systems (Cerutti et al., 2011; Cerutti et al., 2014; Mowat, 2014). However, these works were somewhat limited to individual crops or production pathways, limiting their applicability to the industry as a whole. Additionally, making the quantitative assessment requires a product life-cycle assessment. Given the volume & variety of the products grown in New Zealand by United Fresh members, attempting this would be a significant undertaking, outside the scope of what would be achievable within the time and data available to me.

Varham concludes their report with the following observation:

“Complex systems like the food system generally require the inclusion of many footprints, as the inclusion of a footprint like the chemical footprint, which accounts for pesticides, can give substantially different results when evaluating industrial and organic farmed systems.”

The conclusions drawn by Varham (2019), Cerutti (2011), Cerutti (2014), and Mowat (2014), suggest significant complexity of attempting a life cycle assessment or Environmental Footprint measurement through the direct data measurements, should I attempt to apply a framework similar to theirs to the fresh produce industry as a whole. Any such attempt would require large amounts of detailed data. Such an attempt is therefore considered too in-depth and complex to attempt within the scope of this practicum report, forcing an alternate solution.

2.2. A Legislative & Governance based Framework

Given that the scientific analysis of the fresh produce industry against the SDGs has been identified by my research as inappropriate, I therefore found it necessary to contemplate an alternate method of assessing the industry's progress.

Given the limitations of data, and frameworks, I therefore took the approach of considering progress from a qualitative manner, due to the following factors:

- As United Fresh is a single industry organisation, and not a country, any national/global frameworks will be of the wrong scope and scale for assessments of its work.
- United Fresh does not, in of itself, produce physical goods, and any assessment of sustainability that focuses on physical goods would therefore be inappropriate.
- What quantitative data I may have access to, is usually confidential, or commercially sensitive, and cannot be utilised without seeking permission from the data owners.
- The data I am able to provide without commercial or confidentiality issues is primarily qualitative in nature.
- As an organisation within New Zealand, United Fresh adheres to New Zealand business law. This is not industry specific. Any framework developed based on New Zealand business law as a core concept could also be adopted for use by other businesses or industries.
- United Fresh has an established governance and management system, which directs the scope of work of United Fresh and TAG, according to New Zealand Law.

Given these factors, I determined that a qualitative assessment framework, based on commercial business practices, would be the most effective method of assessing progress towards the SDGs within my practical work.

2.3. The United Fresh Legislative & Governance Framework

United Fresh is an incorporated Society under the Incorporated Societies Act 2022, and is obligated to follow all the requirements of said act, as it applies to aspects of Governance and management.

The requirements of the Incorporated Societies Act include:

- A duty for management and administration of an incorporated society to:
 - Act with good faith and in the best interests of the society.
 - Exercise a duty of care in relation to the nature of the society.
 - Provide information to members.
- Regulations and requirements for appropriate governance practices.

Ensuring United Fresh complies with the governance requirements is the duty of the Executive Committee, while administration and management is the duty of the United Fresh General Manager and United Fresh staff (Confidential Internal Documentation, see as examples United Fresh Executive Manual, January 2023).

I consider this a useful basis for a qualitative framework on the following factors:

- The United Fresh Constitution (2003) sets out the objectives of United Fresh under the requirements of the Incorporated Societies Act 2022. These objectives predate the SDGs, but are focused on achieving beneficial outcomes for the industry, including through the dissemination of information, enabling improved engagement and interaction between industry organisations, and engaging with Government to promote the interests of the industry. The current Executive Manual (Confidential Internal Documentation, January 2023), notes that United Fresh's strategic plan has incorporated the SDGs (Confidential Internal Documentation, 2023), and that sustainability and the SDGs form a part of the United Fresh work which is intended to provide services and representation to the industry, as part of United Fresh's Vision and Mission.
- United Fresh declares its vision and mission as *"Creating a sustainable fresh fruit and vegetable industry for New Zealand"*, and *"Connecting the fresh fruit and vegetable value chain by providing services and representation to industry"*(United Fresh, n.d.-b).
- The method and manners by which United Fresh can implement its vision, mission, and constitutional objectives, is outlined in the Executive Manual (Confidential Internal Documentation, January 2023).
- The United Fresh Executive Committee has governance over TAG work, as set out in the internal Annual Activity Reports (Confidential Internal Report, see as examples United Fresh Technical Advisory Group Annual Report, February 2023). This means it is appraised of proposed TAG work, and has the final decision on approving/declining these proposals,

based on whether it fits the scope of our sustainability technical work. This is an established process, with the Annual Activity Reports codifying the governance requirements as follows:

“The Technical Advisory Group (TAG) is a Committee of the Executive Committee. As such, TAG does not take decisions, but makes recommendations to the Executive Committee, and then acts upon the Executive Committee’s determinations, or after consultation with the United Fresh General Manager.”

- All Executive Committee members have either taken Governance Courses, similar to those held by the Institute of Directors in New Zealand Inc. or other recognised institutions, or have significant professional experience in governance through their work (personal communications, see as example 06 October 2023). Executives follow the principles of the “Four Pillars of Governance” set out by the Institute of Directors in New Zealand (Institute of Directors, 2014). These Pillars include:
 - The requirement for the Executive Committee members to ensure that the Executive Committee has ongoing ownership of the strategic direction and purpose of United Fresh.
 - That an effective governance culture is in place.
 - That United Fresh as a whole is held to account in ensuring appropriate management and performance to the strategy and purpose.
 - That an effective compliance framework is in place, to ensure compliance with all legislation and regulations, including the requirements of the Incorporated Societies Act 2022.
- All Technical Advisory Group work is considered by the United Fresh Executive Committee for ongoing topics during the annual budget proposal. This budget comprises of two parts:
 - A budget for active and ongoing strategic level topics, where the Executive Committee has pre-approved any and all work that may occur in this area as necessary work.
 - A budget for short-term/one-off strategic and operational projects that may arise during the year that cannot be anticipated, and which do not fit into the agreed ongoing work topics. For these topics/projects, the Executive Committee has approved an overall budget for the year. Individual tasks within this budget are approved on a case-by-case basis, following a formal written proposal to the General Manager of United Fresh, who will consult with the Chair of TAG as necessary.

Within this Act, there is therefore a legal and regulatory framework upon which I can assess United Fresh’s progress towards the SDGs, as each task or topic will have been assessed by United Fresh at multiple stages:

1. Each topic will have been pre-approved and ratified under the requirements of the Incorporated Societies Act, prior to any work having commenced. This will have been approved:
 - a. By the Executive Committee for large and ongoing topics that do not require direct and ongoing management; or,
 - b. By the General Manager, following consultation with both the TAG Chair, where this authority has been legally delegated by the full Executive Committee.
2. Each activity has been approved by the Executive Committee, only after consideration to the principles of the Four Pillars of Governance has been taken into consideration. This ensures all work is appropriately aligned with the United Fresh Purpose and Strategy, including the framework in the Strategic plan for work to align with the SDGs.
3. Each task is managed by myself, under the direction of the Chair of TAG. This system ensures:
 - a. That the desired sustainability outcomes are achieved, and,
 - b. That all work is appropriately aligned with the strategy and purpose of United Fresh, under the regulatory requirements set by the Incorporated Societies Act 2022, and the governance requirements of the Institute of Directors under the Four Pillars (Institute of Directors, 2014).
4. The ongoing work on each topic is managed with regular contact between TAG and the General Manager of United Fresh. The General Manager has a legal duty to ensure that the work has occurred in good faith, and delivers the required benefits to United Fresh members by law. This management includes TAG issuing formal updates to the General Manager on all sustainability efforts. The General Manager authorises changes to the work programme where necessary to ensure United Fresh's legal obligations towards sustainability are met.
5. Ongoing Topics have formal written updates supplied to the Executive Committee on a regular basis, and informal updates occurring on an as-needed basis. At a minimum, formal updates occur annually, as part of a formal report to the Executive Committee to meet United Fresh's governance obligations under the Incorporated Societies Act. More frequent updates occur for topics with significant activities occurring, with some topics having formal updates for every Quarterly Meeting of the Executive Committee. The Executive Committee considers all updates and topics presented at each meeting, to determine whether this work is still appropriate from a sustainability perspective, and can authorise or require changes to the work programme.
6. Upon completion of individual tasks or topics, all formal outputs are presented to the General Manager of United Fresh, for distribution to the Executive Committee. The Executive Committee then confirms that the tasks have been completed to the satisfaction of the Executive Committee, and meet the necessary governance obligations.

Under this framework, each task performed by the TAG has therefore been reviewed , from initial proposal, through to completion, by multiple parties. At each step, all involved have legal obligations to ensure the quality and output of TAG. Under this framework, any completed tasks would, at minimum, have been assessed for applicability to sustainability, and the SDGs, by:

1. The Executive Committee, at a strategic level, a minimum of two times (proposal and completion), with additional reviews occurring dependent on project length.
2. The General Manager of United Fresh, from a tactical management level, at monthly to quarterly intervals for active projects.
3. The Chair of the TAG, from a tactical delivery level, who reviews the work ongoing at minimum monthly.
4. Myself, from an operational level, who assesses and manages tasks and projects to ensure delivery of the outputs, with daily oversight.

As such, I therefore propose to use this framework as the basis of my qualitative assessment of United Fresh's work towards the SDGs. It provides:

- A single, unified framework,
- Is directly applicable and already in use by United Fresh,
- Compatible with New Zealand legislation, and,
- Provides objective standards by which progressing the SDGs can be measured against.

2.4. My Chosen Framework Approach

While not SDG or individual target specific, I believe that the governance & legislative framework proposed is an appropriate framework for assessing my work. The non-specificity of the framework, and the framework being based on legal and governance obligations, enable a nuanced and targeted consideration of United Fresh, separately to overall efforts in a region, country, or economic sector. This bypasses several of the limitations found in the scientific and SDG specific assessment frameworks discussed earlier in this report.

I take this position because, as noted in United Fresh's Mission statement (United Fresh, n.d.-b.), United Fresh aims to provide "*services and representation to industry*". These services are listed and discussed within the United Fresh Executive Manual (Confidential Internal Documentation, January 2023), and are linked to the Objectives within the United Fresh Incorporated Society Rules, which are governed by the Incorporated Societies Act (2022).

These Objectives are (Confidential Internal Documentation, January 2023):

- Bring together all companies, sector groups, and interests in the New Zealand fresh produce industry for the good of all parties.

- To collect, disseminate, and interchange information of all kinds, of interest to members.
- Foster harmonious relations between all interest organisations, companies, and sector groups in the New Zealand fresh produce industry.
- Lobby Government, whether at a national or local level, to promote or protect the best interests of the New Zealand fresh produce industry.
- Join together at such meetings, conferences, or other functions, whether of an educational, business, or social nature in the furtherance of any other objective of the society.

Any such provision of services or representation by United Fresh for its members has therefore been justified as necessary to meet at least one of these objective, before action was taken, within a legal framework.

The critical question that should therefore be asked, in order to analyse the work that has occurred, should then be, why has United Fresh provided the services and representation that form the activities covered here?

United Fresh describes the provision of TAG work as follows:

“We are an organisation that bases our services on sound science, best business practices and respect for all, taking a measured approach in all that we do, ensuring we add value for our members...”

Through our Technical Advisory Group (TAG) we work on behalf of and in partnership with members and other stakeholders...” (United Fresh, n.d.-d.).

United Fresh’s position is therefore that the services provided through TAG meet the requirements of the Objectives, which, as discussed in Section 2.3 and 2.4, allow me to assess these works from a qualitative viewpoint.

I note that this qualitative work viewpoint is discussed in the Sustainable Development Goals Guidelines published by United Fresh (Maurer, Lawes, and Inacio, 2023). These guidelines state that they were published to fill a knowledge gap in the industry, because:

“very little appears to have been achieved in the six years between 2015 and 2021 towards helping New Zealand in general and, specifically, the produce industry to understand and work with the SDGs.

That is the rationale behind United Fresh deciding to publish this set of guidelines...

The purpose of these “Indicators Aotearoa New Zealand” is to bring the SDGs to life at a country–strategic level and provide an element of guidance on the decisions any organisation across the multiple industries that operate within New Zealand ought to consider when implementing SDGs from their respective perspectives.”

United Fresh has therefore delivered this activity from a qualitative perspective, i.e., providing a service that enhances implementation of sustainability, where a gap previously existed.

Many of the other SDG related activities have a similar rationale, which is often outlined in the documentation related to this activity, albeit usually relating to the direct sustainability activity being performed. For example, in activities relating to formal submissions to Government, statements such as this may be found:

“United Fresh also welcomes the opportunity to comment on the proposed changes by way of this submission, as it provides us, as the pan-produce industry body, with the opportunity to enhance our membership’s understanding of the issues” (Lawes, Baptist, and Maurer, 2023).

A similar statement can be found within United Fresh member communications on technical topics, e.g., as in the United Fresh Technical Advisory Group Update of May 2021 (Members Update Email, May 2021):

“We aim to provide you with a snapshot of information on topical and relevant food safety issues and, where applicable, the links to allow you to take your knowledge further.”

Using the rationales presented, it can be seen that the core aspects of these works are qualitative in nature, and need to be considered as such. Given this, and that the Governance and Management of TAG work occurs in a qualitative fashion, as discussed in Section 2.3, my work for TAG is therefore assessed by United Fresh at a qualitative level.

3. My Practicum Analysis

With the general qualitative framework under which I will be assessing my practical work now established, it is possible to begin analysing my work over the last 5-6 years for United Fresh, and how it has progressed the SDGs within the New Zealand fresh produce industry.

As part of doing so, I first must outline my rationale for how I will be assessing my work, and how this aligns with the general framework.

This is necessary, because my work for United Fresh related to the SDGs is, as discussed in previous sections, not a single piece of work, but rather several one-off and ongoing activities at a strategic level, which may comprise smaller sub-activities. Given this, I find it necessary to examine each strategic activity individually, as the activity is not necessarily related to other activities, and thus have to be considered separately.

3.1. Analysis Framework: Holistic, Not Individualistic

Due to the manner in which United Fresh operates, the SDG related activities in which I have participated are varied, extending from multi-year projects covering a variety of topics, to individual activities on small topics that may take as little as a day to complete.

While I am able to set out a theoretical framework for examining my work at an individual level, applying, and testing such a framework would require an extensive examination of dozens of projects across several distinct categories, along with an explanation of why United Fresh has categorised each activity as such. As such, a holistic approach, examining the work as a whole, is a more appropriate approach for examining the overall impact of my work on sustainability of the industry as a whole.

However, as the individual activities, and the explanations for these activities, are still important in gaining an appropriate understanding of sustainability efforts within the industry, an analysis of selected individual activities has been included in the Supplementary Appendix: TAG SDG related Activities.

The work has been assessed, within the analytical framework I have developed in Section 2, as to how my activity advanced the SDGs as a whole, and the selected targets in particular.

3.2. Analysis via an Exemplar

As discussed in Section 2, I am unable to adequately measure my TAG work in any form of quantitative manner, and must therefore examine it from a qualitative position. However, I am of the view that the qualitative position is just as important to consider as the quantitative.

I am therefore assessing my work under the qualitative framework set out in Section 2.2 and 2.3. As this framework is identical for all activities, I am using the process of making a submission to the Ministry of the Environment on New Zealand's Emissions Trading Scheme (Lawes, Baptist, and

Maurer, 2023) as an exemplar of the overall framework applied to all my work.

I am assessing the exemplar at the following points:

- High level topic approval by the United Fresh Executive.
- Individual activity approval by United Fresh Management.
- Activity management during activity delivery.
- Activity review by United Fresh Management, while an activity is ongoing.
- Activity completion review, following conclusion of each individual activity.
- How this particular activity progressed the selected SDG Targets.

Following an examination of the exemplar, I am then validating how my work as a whole has progressed my selected Targets. More in depth examinations of other activities and high-level topics are included in the Supplementary Appendix: TAG SDG related Activities.

Once I have analysed the activity within the United Fresh Framework, I then intend to critically reflect on my work.

3.2.1. High Level Topic Approval

The United Fresh Executive Committee has approved the overall topic of “Submissions to Government”, under the rationale presented in the TAG Annual Activity Report presented to the Executive in February 2023 (Confidential Internal Report, see as examples United Fresh Technical Advisory Group Annual Report, February 2023):

“From time to time, various government departments may request information or submissions on areas of legislation and regulation that affect United Fresh members. These requests may cover one or more of the areas that TAG has expertise in.

When a request is made, TAG responds in the format requested by the government, and provides the government department requesting the information with the industry’s views of the impacts and consequences of the legislation or regulation being considered. This hopefully contributes to informed decision making, on legislation and regulations that may affect the produce industry directly or indirectly.”

This rationale is complemented in the document with a “Proposed Initiatives” section, outlining what TAG expected would be occurring in this Topic Area throughout 2023.

Both the Rationale, and the Proposed Initiatives, were approved for the 2023 year by the Executive Committee.

3.2.2. Individual Activity Approval

In July 2023, TAG determined that a submission would likely need to be made on the topic of “Review of the New Zealand Emissions Trading Scheme” (Ministry for the Environment, 2023). A proposal was therefore crafted (Confidential Internal Report, United Fresh Technical Advisory Group Proposal, , July 2023) and presented to the General Manager of United Fresh, outlining the proposed scope and direction of activity, for approval. In this proposal, TAG noted the following:

“a coherent response, which accurately covers the whole of the supply chain, does not exist in this topic...”

Having recently released our sustainability guidelines, and indicating to industry that we would be increasing our presence in the sustainability space, failing to submit on a topic that could have long-term financial repercussions for the industry would not assist the industry in maintaining sustainable practices.”

This proposal, with the rationale for this individual submission being necessary, was accepted and approved by the General Manager (Internal Email, July 2023).

3.2.3. Activity Management

During the drafting, editing, and review process of the submission, I managed the delivery of the activity using the TAG Activity Management framework developed by the TAG Chair and myself (Confidential Internal Documentation). The final draft was released to the TAG Chair for peer review, once I had determined as Projects Manager that the activity had been completed to a state that could be considered for release. This peer review ensures that both TAG and I meet the Governance and Management obligations (“the obligations”) required by the United Fresh Constitution and the Incorporated Societies Act 2022.

Once peer reviewed the TAG Chair, the final draft was submitted to the United Fresh General Manager, who reviewed the document met the obligations placed on United Fresh.

Only once this document had been reviewed by myself, the TAG Chair, and the General Manager of United Fresh, to confirm it met the obligations for United Fresh, was the final submission submitted to the Ministry for the Environment.

3.2.4. Activity Completion Review

With the activity completed, the submission was given to the General Manager, for presentation at the next Executive Committee meeting. At this meeting, this submission will be reviewed by the Executive Committee, to confirm that all obligations have been met, and that the delivered outputs were satisfactory. At the time of writing, this meeting was yet to occur, but was scheduled for 9 November 2023.

3.2.5. Progression of Selected Targets

My analysis of how this exemplar activity progresses the three selected SDG Targets, 9.1, 9.4, and 12.2, is linked into how the overall high-level topic of Submissions progress the selected Targets. The Submissions topic is analysed in depth in the Supplementary Appendix: TAG SDG related Activities. However, I am repeating the high-level analysis of the linkage to the individual targets here, as it is equally relevant to the individual submission.

- Target 9.1: Submissions may not directly “build” infrastructure under the UN definition of SDG 9, or “develop” the infrastructure under the wording of Target 9.1 (United Nations, 2015). However, the TAG Annual Activity Reports (Confidential Internal Report, see as examples United Fresh Technical Advisory Group Annual Report, February 2023) note that submissions enable the government to understand:

“the industry’s views of the impacts and consequences of the legislation or regulation being considered. This hopefully contributes to informed decision making, on legislation and regulations that may affect the produce industry directly or indirectly.”

Looking at implementing the targets of SDG 9, the UN ESCAP in 2023 noted:

“policies should promote a green, inclusive and resilient recovery... [a] transition towards higher-productivity, innovation-focused industries that could provide enhanced growth opportunities and higher economic resilience.” (ESCAP, 2023).

The development of SDG Target 9.1’s “resilient infrastructure” (United Nations, 2015) can therefore be considered to be advanced by United Fresh’s Submissions activities, as these support the building and development of the policies which will govern and manage the building of the physical infrastructure.

- Target 9.4: Being able to “upgrade infrastructure and retrofit industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes” (United Nations, 2015) requires a legislative framework that supports the SDGs. For Ladan (2015), “the law is both an enabler and facilitator of development that is both inclusive and integrative of all the three dimensions of sustainable development”.

Given that the law and related policies are also noted as challenges to implementing sustainable food systems and industry (Galli et al., 2020), working towards ensuring legislation reflects the realities of how an industry can achieve sustainability should be considered a core part of United Fresh’s work towards Target 9.4.

- Target 12.2: The point is raised by Ladan (2018) and Garske et al. (2020) in their research, of the need to consider and implement appropriate legalisation, in order for industry to achieve sustainability. The impact of legislation on how the produce industry could achieve

sustainability with regards to “*sustainable management and efficient use of natural resources*” are also discussed in United Fresh submissions, such as when discussing the use of plastic labels (Maurer, Arts, and Lawes, 2020).

United Fresh is therefore aware of the link between resource usage and the legislative impacts that may hamper or assist industry’s ability to improve resource efficiency, and considers 12.2 to be a part of its Submission activities.

These rationales presented here, for how Submissions as a topic link to the selected Targets at a high level, are also equally applicable to the individual submission:

- Target 9.1 and the Exemplar: The exemplar submission relates to updating the regulations and legislation surrounding a system intended to help reduce New Zealand’s carbon emissions and our environmental impact (Ministry for the Environment, 2023). United Fresh made this particular submission on the following basis (Lawes, Baptist, and Maurer, 2023):

“United Fresh is of the view that a well-designed revised NZ ETS will be much more effective, efficient, and enduring than the current system, if it forms part of a wider framework with each individual regulatory tool designed to be targeted in scope and to form a holistic system. This would drive New Zealand towards the desired low carbon future...”

Any new regulations or tools related to reducing greenhouse gas emissions that do not take into account the realities of maintaining our position of maintaining food security within New Zealand, and within our trading partners, could result in unintended consequences, which United Fresh has no wish to see.”

Given these points, I argue that there is a clear link between this submission, and the policies that “*promote a green, inclusive and resilient recovery...*” (ESCAP, 2023) to meet Target 9.1.

- Target 9.4 and the Exemplar: Galli et al.’s (2020) discussion focused on the fact that laws and policies can present barriers to implementing sustainable food systems. Ladan’s (2015) argument supported this, noting the need the law to enable the appropriate development of the industry. United Fresh’s submission raising the issues if legislation does not reflect industry realities therefore emphasises Galli et al. and Ladan’s findings. United Fresh needs to make submissions on relevant topics. This contributes to legislation and policies being developed in a way which enables industry to implement environmentally sound processes and technologies, that abide by the legal requirements.
- Target 12.2 and the Exemplar: United Fresh raised the issue of managing natural resources, and in particular, fossil fuels, afforested land, and general land use, when it answered questions raised by the Ministry for the Environment (Lawes, Baptist, and Maurer, 2023). The submission discussed ways in which legislation and regulations could be used to help encourage more efficient use of resources, including through developing innovative solutions and technologies. This submission therefore directly addresses Target 12.2.

4. Critical Reflection

Using the Exemplar discussed in Section 3, and the more detailed analysis of a significant subset of my work for TAG in the Sustainability space in the Supplementary Appendix: TAG SDG related Activities, I believe I have comprehensively and with a high degree of certainty assessed the link between my work has progressed the SDGS.

Having completed this, I can now critically reflect on the overall work itself, to evaluate how this work has advanced both my understanding, and ability to better implement the SDGS, as well as analysing how implementing the SDGS created challenges and opportunities.

In order to so, I am using the critical reflection model proposed by Gibbs (1998), a commonly used reflection model (Knowles et al., 2006; Quinton & Smallbone, 2010; Husebø, O'Regan, & Nestel, 2015; McCallum & Milner, 2021).

The Gibbs model of critical reflection is divided into the following 6 stages:

1. The description of the experience(s).
2. The practitioners' feelings / thoughts about the experience that occurred.
3. An evaluation of the experience, examining both the positive and negative aspects.
4. An analysis of the resulting situation
5. A conclusion / learnings generated, related to both the process, and the outcomes.
6. An action plan for responding to the situation in the future.

In Gibbs' model, this is a recursive and cyclical process, where each stage leads into the next, with the action plan forming the foundation of how a practitioner should respond to the next experience. Gibbs' model must therefore be considered not as a one-off process, but model, where each iteration by the practitioner will further develop their skills and processes in responding to the next experience.

As I have already thoroughly discussed the practical aspects of the process and outcomes of my experience in Sections 1, 2, 3, and in the Supplementary Appendix: TAG SDG related Activities, I intend to cover the remaining 5 stages in this section. However, as noted in Section 3, due to the complexity of the nature of my work, and the varied range of activities completed, I am choosing to reflect on the high-level strategic experience, as this is relevant to the entirety of my work, and not focusing on individual activities or single topics.

4.1. My Thoughts on the Experience

This section will be based on my professional viewpoint, as someone who has been delivering practical outcomes related to the SDGs since 2017, for the entirety of the fresh produce industry.

I have several distinct areas of thoughts related to my work with SDGs, and their application within the fresh produce industry. I am discussing these in the following categories:

- The unsuitability of the United Nations SDG Targets and Indicators for use by commercial, or commercial adjacent organisations.
- The process of 'localising'/adjusting the SDGs to meet the realities of the fresh produce industry.
- Applying the SDGs after 'localisation', and industry participants' feelings about the SDGs, prior to, during, and following the delivery United Fresh activities.
- My thoughts on the current situation.
- My overall feelings.

4.1.1. SDG Target & Indicator unsuitability

One of the recurring sets of thoughts that I have consistently experienced over the period of working for United Fresh is the manner in which the United Nations has selected and described the SDG Targets and Indicators of the United Nations 2030 Agenda (United Nations, 2015).

As a professional tasked with implementing these across an industry, a significant number of Targets & Indicators are, from an industry viewpoint, wholly insufficient for measuring progress for any organisation that is not a government or international aid body.

Additionally, many of these Targets and Indicators which can be applied by industry, do not adequately apply to those countries who Dados & Connell (2012) refer to as "the Global North", but instead focus only on enabling the poorer countries of the "Global South" to advance. This is, to my thoughts, problematic. How can the Global North measure its progress, or determine what it needs to progress towards, when many of the Targets are designed in a way that suggests they have little to no relevance?

For example, as I have discussed earlier in this report, United Fresh and myself have focused on implementing SDG 9.1, on the basis of this being labelled as *"Develop quality, reliable, sustainable and resilient infrastructure, including regional and transborder infrastructure, to support economic development and human well-being, with a focus on affordable and equitable access for all"* (United Nations, 2015).

Upon reading this description for the first time, my thoughts on this Target were that it would be immediately suitable for United Fresh and United Fresh members, due to the explicit mention of *"sustainable and resilient infrastructure"* and *"to support economic development and human well-*

being". These, at first glance, align with the stated Vision and Mission of United Fresh for the fresh produce industry (United Fresh, n.d.-b.).

Yet, there are only two official Indicators attached to Target 9.1, which are (United Nations, 2015):

- 9.1.1: Proportion of the rural population who live within 2 km of an all-season road.
- 9.1.2: Passenger and freight volumes, by mode of transport.

From an industry professional's perspective, these fail to consider any infrastructure not related to logistics network capacity and capability, which means Target 9.1 ignores the non-logistics infrastructure.

This is not the only Target that this inability to consider commercial or local community requirements applies to, in my view, which is supported by the outcomes of several of my activities discussed in the Supplementary Appendix: TAG SDG related Activities.

The need for this relevant guidance on how the SDGs apply to Global North industry is the reason for United Fresh releasing its SDG Guidelines publication in 2023 (Maurer, Lawes, and Inacio, 2023).

Given this lack of alignment between the SDGs and sustainability in the Global North, my thoughts are that, conceptually, the 17 SDGs offer a significant framework by which sustainable development can be defined and measured. However, the official measurement system of Targets & Indicators attached to the 17 SDGs is, in my view, in need of adaptation or replacement by any non-Government organisation working in the Global North who wishes to implement them.

4.1.2. 'Localising' the SDGs

Given the lack of full alignment between the United Nations SDGs stated Targets & Indicators, and the reasoning for the United Fresh activities being implemented to develop sustainability within the fresh produce industry, I have been required to consistently consider the process of 'localising' the SDGs for each individual activity undertaken, to determine how it meets industry definitions of sustainability, and how this aligns with the SDGs.

The process of developing the SDG Guidelines for United Fresh (Maurer, Lawes, and Inacio, 2023) reinforced my thoughts on this position. Developing the Guidelines involved translating the United Nations definitions into ones that would be of use to industry in implementing sustainability in a strategic manner aligned with the SDGs, even if industry concepts around what constitute appropriate Targets & Indicators were different to the United Nations Targets & Indicators.

My initial thoughts prior to localisation was while my work met the stated high-level concepts of the SDGs, when trying to match my work to Indicators or Targets, I would often struggle.

However, once I had developed my own internal concepts about how my activities could be linked to the SDGs, I found myself considering much of the work to have multiple linkages to the SDGs. Now that United Fresh has developed a fresh produce specific framework, I am now able to confirm

even further linkages to the SDGs with my activities. My thoughts on the localisation of the SDGs are therefore extremely positive.

As a result, my current thoughts on my sustainability work is that, regardless of the United Nations stated Targets & Indicators, I have a valid framework by which I can prove how my work advances sustainability, and the SDGs in particular.

4.1.3. Applying the localized SDG framework

My thoughts on this topic are somewhat more limited than those in other sections. My work with the TAG team on fully localising the SDGs into Guidelines for the New Zealand fresh produce industry only concluded in 2023 (Maurer, Lawes, and Inacio, 2023). I therefore only have a period of several months of work to consider, as opposed to the six years of activity prior to localisation.

However, to date, my thoughts on this topic are that localising the SDGs for the fresh produce industry has been a resounding success, and I am happy with the continuing progress.

Following the release of the industry Guidelines, I have been engaging with industry to discuss their thoughts around the SDGs, and the Guidelines. Multiple conversations I have had with industry participants, from different businesses and stages of the value chain, have discussed their thoughts with regards to the United Nations and United Fresh framing of the SDGs (personal communications, see as example 6 August 2023). These conversations, while anecdotal, have in the main been about the industry participants struggle to understand how aspects of the SDGs relate to fresh produce, or their business.

Several of them have had very positive reactions (personal communications, see as example 6 August 2023) to the United Fresh Guidelines Document (Maurer, Lawes, and Inacio, 2023). They indicated that they now realised the relevance of SDGs that they previously thought were not applicable (personal communications, see as example 5 August 2023), as United Fresh had shown industry relevant examples of how the SDGs were linked to the fresh produce industry, which were not obvious to the majority of the industry. These engagements concluded with the industry participants indicating that they would reconsider how they viewed sustainability and the SDGs, in light of the work performed by United Fresh.

My thoughts on the application of the SDGs to the fresh produce industry are therefore that United Fresh is showing industry how the SDGs can be achieved in an industry relevant manner. This is occurring both in the Guidelines, and in the other activities of TAG, such as the United Fresh topics of Submissions to Government, Biosecurity, Traceability, and Food Safety. These are analysed in detail in the Supplementary Appendix: TAG SDG related Activities.

4.1.4. The Current Situation

Finally, there are my thoughts on the current situation of sustainability in the New Zealand fresh produce industry.

Here, I consider my thoughts and position to be more constrained and cautious, as compared to my thoughts on the activities carried out previously.

While the activities completed to date have been positive for sustainability, I note that my work needed to be assessed qualitatively for this report, due to the inability to measure much of it in a quantitative manner. This means that while the activities have progressed the SDGs, the lack of a quantitative measure for them makes it difficult to determine the overall impact, only that the activity was completed, and the learnings are now available for the industry to utilise.

Secondly, I note that the work of TAG for United Fresh is constrained by the governance and management obligations TAG and United Fresh must currently follow. The current framework somewhat limits that which TAG can react to in a rapid manner, with activities and topics which are not pre-approved requiring approval by the Executive Committee at a regular meeting, and which has to be considered within the TAG budget which was approved at the start of the calendar year (Confidential Internal Documentation, see as examples TAG 2023 Budget, February 2023).

This means that the potential exists that TAG may not be able to work on activities outside the current scope, or may need to source additional funding to complete activities.

However, where the TAG scope does cover activities related to the SDGs, TAG now has several years of knowledge and learnings around implementing the SDGs in a variety of ways, which will only expand as TAG continues to provide technical capacity to United Fresh in the coming years.

Given this, I see the continued implementation of the SDGs by United Fresh as dependent on TAG's scope. Where activities are in scope, TAG will continue to enable United Fresh to act in assisting the industry in becoming increasingly more sustainable. Where activities are outside this scope, these may not be progressed, or require alternative solutions to be progressed.

4.1.5. Overall Thoughts

Overall, I see my work for TAG as a positive for the industry. Being the only pan-industry body for fresh produce in New Zealand, (United Fresh, n.d.-b.) if United Fresh does not take a position on the SDGs and sustainability for the industry, there is no other party capable, or willing, to represent the industry in such a manner.

That United Fresh has done so means the industry has a coherent voice with regards to implementing the SDGs in a suitable manner. What remains to be seen, in my view, is the future, and whether the industry continues to utilise the outputs of the activities completed by TAG.

Given the progress in implementing SDG related activities over the 2017-2023 period, I am hopeful that the work completed to date will act as the foundation from which more significant and ambitious work can develop.

4.2. Evaluating the Experience

In attempting to evaluate the overall work done for United Fresh, I have considered both the negative and positive aspects of my work, which I wish to discuss here.

4.2.1. Negative Aspects

- As an incorporated society under the Incorporated Societies Act 2022, United Fresh was limited in how it can implement the SDGs. This is because United Fresh has no legal power over its members, and the decision to implement the learnings of any United Fresh activity is therefore up to individual members. This means that the implementation of SDG activities will only occur if a United Fresh member considers the activity applicable to their business.
- With regards to the Submissions to Government topic, United Fresh is a private organization, and therefore cannot dictate government policy. If Government, for valid reasons, determines that suggested actions to improve sustainability will not occur in future legislation, regulations, or activities of ministerial departments, United Fresh cannot change this outcome.
- The United Nations framing and wording of the 2030 Agenda (United Nations, 2015) meant that industry commonly struggled to understand the relevance of all the SDGs, and at times, considered that only selected SDGs were of relevance (personal communications, see as examples, 6 August 2023). This is contrary to the 2030 Agenda, which states that the SDGs must be approached in *“their entirety instead of approaching them as a menu list of individual goals”* (United Nations, 2015).
- The qualitative manner of my work makes it difficult for me to measure its impact on sustainability. While I can show evidence of what I have worked on, I cannot show what impact it has had in terms of accurate data, only statements from personal conversations with industry. Where industry may collect data related to the impacts of the SDG related activities of United Fresh, their data may be confidential, so even if it exists, I may not be able to analyse it.
- The fragmented nature of United Fresh activities around the SDGs risks potential gaps in what United Fresh can provide to the industry in terms of guidance and knowledge. Activities have until now been based around meeting an extant need for the industry, to solve an active problem. This means that what is not a problem for the industry has limited thought put into it. This means that some SDG related knowledge work may be yet to begin, or not yet been considered.

4.2.2. Positive Aspects

- United Fresh's scope of activities being focused towards active and extant problems for the industry means that United Fresh is able to respond to active sustainability challenges, and provide relevant and timely knowledge with a New Zealand fresh produce context.
- While the qualitative nature of TAG activities makes it hard to measure in some respects, the work has been undertaken on the basis that it was approved by the Executive Committee or General Manager of United Fresh. This means that the work has been considered by United Fresh, and found to be necessary in assisting the industry to implement solutions that advance sustainable practices. Each activity can therefore be considered as a step on the ongoing path to sustainability, as it was initiated to close an identified sustainability gap.
- TAG's work on the fresh produce industry Guidelines to the SDGs (Maurer, Lawes, and Inacio, 2023), means that the fresh produce industry now has a set of Guidelines which are relevant to industry members, which outline how all 17 SDGs are relevant to them, and assisting them in implementing the SDGs. This was not a situation which existed in the industry prior to the Guidelines publication.
- While United Fresh cannot determine Government legislation, regulations, or policy, United Fresh has been able to leverage our engagement with Government on individual submissions into additional engagement opportunities, where United Fresh has been able to discuss how legislation and policies might be designed to better guide the industry in the long-term. For example, following the submissions to Government on the Grocery Retail Market Study (Maurer & Lawes, 2021-a; Maurer & Lawes, 2021-b.; Maurer, 2021), United Fresh was invited to have the TAG Chair join the Government's Grocery Code of Conduct Advisory Group (Confidential Internal Documentation, see as example email 29 March 2022) to represent the fresh produce industry, and to provide feedback on how the proposed Code of Conduct might affect the industry.
- As an Incorporated Society, with members from across the fresh produce value chain, United Fresh is not competing with, selling to, or buying product from our members, and is therefore a neutral party within the industry. This means that there is no financial motive determining what United Fresh works on, and therefore allows United Fresh to work on activities that may temporarily disadvantage individual members, but which develops the long-term sustainability of the industry as a whole.

4.3. Situation Analysis

My view of the SDG related work completed for United Fresh is that the process has worked well, and that the framework of implementation has enabled effective implementation of the SDGs in United Fresh's work.

The process of peer review is well established in ensuring the quality and accuracy of science (Spier, 2002; Shatz, 2004). United Fresh's operational framework of multiple reviews of TAG work is compliant within the scope of the requirements Incorporated Societies Act 2022, but also is aligned with the Governance requirements of the Four Pillars of Governance (Institute of Directors, 2014).

While United Fresh may not have implemented peer-review within the scientific publishing context, I note that the processes and outcomes are in alignment of delivering "*a check and filter to ensure that the best possible report... is published*" (Allen et al., 2019).

As each stage of the peer review process within United Fresh is conducted at different levels, and for different governance and management reasons, this helps ensure the minimisation and prevention of groupthink discussed by the Institute of Directors as a challenge towards effective management (Institute of Directors, 2014).

I believe that this strong governance structure, and the associated peer-review, has helped ensure the practical aspects of sustainability were appropriately implemented by United Fresh in its work, leading to the ongoing success of the activities undertaken.

Where I believe my work has not been as successful, is in the measurement of implementation success. Given the qualitative nature of the work, United Fresh cannot measure this work in a quantitative manner, to determine overall impact. Instead, the primary indicator of success for United Fresh to measure implementation success within a framework, is at present, solely the Governance process under the United Fresh Constitution (2003).

This lack of quantitative measurement of success is not, in my view, related to the success or failure of activities in implementing the SDGs. Rather, I view this as an in-built constraint of my chosen framework, as well as potentially outside the scope of the work which could be undertaken by TAG at present.

I am of the position that future work in measuring SDG implementation success by United Fresh could, if conducted within the right framework, better measure the quantitative aspects of United Fresh's work. However, this would not align with the United Fresh governance framework utilised by me during my practical work, and would therefore have its own constraints.

4.4. Learnings Generated

Overall, I believe I have generated several learnings from the work performed for United Fresh. Some of the more significant learnings include:

- Any measurement framework chosen will have advantages and constraints, which will affect how you can assess an activity. This does not render my chosen framework as ineffective or inappropriate, merely more suitable in assessing some criteria, and less suitable for others.
- United Fresh has, within the framework of the Incorporated Societies Act 2022, the United Fresh Constitution (2003), and the governance principles of the Institute of Directors (2014), implemented multiple activities that have progressed the SDGs in the New Zealand fresh produce industry.
- The lack of Targets and Indicators of relevance to the fresh produce industry, or more developed nations in general, has shown a need to effectively localise the SDGs, in order to be able to understand and apply them from an industry perspective. With the publication of localised guidelines for the New Zealand fresh produce industry (Maurer, Lawes, and Inacio, 2023), this is now possible.
- United Fresh needs to continue to act as the pan-industry body in all matters SDG and sustainability related, helping the industry move as a whole in a more sustainable direction.
- Assessing opportunities for removing gaps in the ability to adequately measure quantitative impacts of SDG related work in the industry may be of benefit.
- Sustainability, and the SDGs, will continue to be a key topic for United Fresh, but the enabling regulatory and legislative environment may alter how United Fresh is able to respond.

4.5. Action Plan for the Future

Due to much of my work for United Fresh being confidential or involving non-public information, I cannot talk about much of the action plan for the future, with respect to many future activities.

However, I am able to talk in generalities about what I view as an appropriate pathway forward, based on my learnings over the 2017-2023 period.

- Communications from industry in New Zealand indicate that United Fresh should continue to work on sustainability for the benefit of the New Zealand fresh produce industry (Confidential Internal Documentation, see as examples email 2 June 2023).
- Engagement with members on the topic of SDGs will need to be expanded, to identify further opportunities for driving sustainability, while also sharing the knowledge generated to date.
- United Fresh has the opportunity to leverage its international partnerships, such as with IFPS, to develop and align the global fresh produce industry efforts at implementing the

SDGs, and therefore gaining the benefits of knowledge generated overseas.

- The positive impacts of engaging with Government outside of the reactive Submission process could lead to additional opportunities to implement the SDGs, as shown by United Fresh's participation in the Grocery Code of Conduct Advisory Group (Confidential Internal Documentation, see as example email 29 March 2022).
- Engagement opportunities likely exist with other industry bodies & associations who cover other agricultural products, who would be able to share their relevant knowledge.
- The pan-industry approach enabled United Fresh to work on activities that benefit the industry as a whole, which continues to derive benefits for the industry.
- Given that New Zealand as a whole is struggling to meet the SDGs (Ministry for Foreign Affairs & Trade, 2019), United Fresh has the opportunity to become a sustainability thought leader in New Zealand, by helping industry efforts meet or exceed both industry generated SDG Targets, and the United Nations Official Targets (United Nations, 2015).

5. Discussion

Until this point, my report has primarily been examining the sustainability and SDG activities of United Fresh from an industry focused perspective that exists within my chosen framework. This has generated several learnings in the process.

5.1. Framework Analysis

The results of using my selected framework indicate that my analysis in Section 3 was validated during the process of my assessment. The advantages of being able to use a framework that aligned with the regulatory environment experienced by United Fresh, and which considered progress in a qualitative manner, enabled my assessment of the work undertaken by United Fresh, and did not constrain my ability to accurately determine progress.

However, I also identified that the framework limited my assessment, as without a method for quantitative measurements, I must rely on the qualitative data. This somewhat limited the depth to which I could assess progress, beyond the completion and release of activity outputs. This means that I am unable to utilise data models and assessments of the SDG progress, such as those proposed by Gennari & D’Orazio (2020).

This means that, while appropriate for my use case, the selected framework may be of limited use in being extended beyond its core functionality, and that more appropriate frameworks and assessments would be required for further analysis to occur, or for more quantitative analyses.

5.2. Key Findings

The key issue I intended to address with this report was:

“how achieving a sustainable and resilient fresh produce industry in New Zealand has progressed via my work for United Fresh, and whether the industry faces further challenges in progressing targets 9.1, 9.4, and 12.2?”

I believe that, given the findings of my assessment, that I have successfully proven that my work has progressed the SDGs, but also that the industry faces further challenges in progressing my selected Targets.

The exemplar discussed in Section 3, as well as the list of selected activities in the Supplementary Appendix: TAG SDG related Activities, both show how I was able to assess and determine links to the SDGs. This work was also able to identify links to my selected Targets.

However, as discussed in Section 4, there are several barriers related to the implementation of the SDGs by United Fresh. These have hindered United Fresh’s activities, and placed constraints on what could occur. These barriers are not United Fresh specific, but relate to the fact that the United Nations 2030 agenda, and the SDGs (United Nations, 2015), required localisation by United Fresh to be effective, with the need for this localisation in future works being ongoing.

5.3. My Reflection

My reflection in Section 4 identified that the framework was effective for me in acting as “*a check and filter*” for my work (Allen et al., 2019), and that other members within United Fresh had independently verified the connection to the SDGs.

I identified that there were several negative and positive aspects to my work, that constrained the ability of United Fresh to act on the SDGs in some ways, while supporting the implementation of the SDGs in other ways.

I concluded my reflection with an action plan for what I view as the next steps United Fresh should take, based on my generated learnings about United Fresh’s efforts in localising and implementing the SDGs within the fresh produce industry.

5.4. Implications

The overall findings of my assessment provide new insights into the implementation of the SDGs, both by the fresh produce industry, and by United Fresh.

The previous findings of PWC (2015) and Oosterhof (2018) about the need for localised frameworks for implementing SDGs has been reinforced by the learnings and data I have generated during this report, in addition to being a catalyst for the publication of United Fresh’s guidelines for the fresh produce industry on implementing the SDGs (Maurer, Lawes, and Inacio, 2023).

This report also emphasises the need for United Fresh to continue its SDG and sustainability related work, especially in areas where:

“a coherent response, which accurately covers the whole of the supply chain, does not exist in this topic...”

Finally, I have shown through both the literature sources, as well as my work, that implementing the SDGs does not have to be driven by Governmental policies, and that industry has a part to play in sustainability, even when it may not understand the full scope of that part to begin with.

5.5. Limitations

While this work has proven useful in my assessment of United Fresh’s sustainability work, I acknowledge that it has several limitations which may affect its applicability elsewhere, or in considering how it might be extended into further analysis of United Fresh work.

- The lack of quantitative data held or generated by United Fresh during activities, which might have been relevant to this assessment, prevents any operational assessment of individual activities and their outcomes. This report is therefore limited to a strategic level only.
- The framework used for assessment is developed within the New Zealand legal context, and focused on private organisations. This assessment is therefore likely to be of limited use in a

situation where the primary focus is a government, a community organisation, or a non-New Zealand based organisation.

- United Fresh works on all sustainability topics related to the fresh produce industry, consciously or otherwise. However, my reflection and analysis relate only to the work which I specifically have been involved with, and which related to my three selected Targets. This means that not all the United Fresh sustainability work has been examined here, and nor has the totality of my sustainability or SDG work for United Fresh.
- The work examined here covers a variety of individual activities that occurred across several years. Learnings generated in one activity were used to inform the scope and management of subsequent activities. However, this limited my work to examining the activities as a holistic and ongoing process, as the environmental, social, and regulatory frameworks were often different by the start of the next activity.
- The analysis and reflection in this report focuses solely on completed activities, and does not cover any ongoing or expected future activities. This is because there are confidentiality and privacy concerns related to active or future activities, some of which may be altered or replaced prior to implementation. As such, the conclusions I have drawn here from the analysis and reflection may no longer be as valid in the future, once additional activities have commenced.

Despite these limitations, however, I am of the view that I was still able to accurately and critically assess how my work had progressed my selected objectives for this report, and whether or not my work was assisting in managing United Fresh's implementation of the SDGs in a New Zealand fresh produce industry context.

6. Recommendations

While my analysis of the current state of SDG implementation by United Fresh is complete, there are still many opportunities for further investigation into assessing the implementation of the SDGs in the New Zealand Fresh produce industry.

Some of the avenues I have identified as potential extensions to my work include:

- Examining how other fresh produce industry participants in New Zealand are using the outputs of United Fresh activities to assist in implementing the SDGs.
- Comparing and contrasting how other agricultural industry bodies and associations, both within New Zealand and globally, may have differing frameworks for assessing their sustainability work, and how this affects their implementation of the SDGs.
- Contrasting how fresh produce industry associations in other countries implement the SDGs within a governance framework.
- Analysing the differences between how an incorporated society is able to implement the SDGs within the legal framework, and comparing how this differs to a commercial organisation, within a New Zealand context.
- Analysing a selected United Fresh activity against all the SDG Targets, to identify the full extent of which each activity progresses the SDGs as a whole.
- An analysis of United Fresh under an alternative framework, to consider how the different frameworks may affect the assessments of success in achieving the SDGs.

While not an exhaustive list, this shows that there are still many opportunities for knowledge extension related to the governance and management of SDG implementation activities in the private organisation space, and particularly in the fresh produce industry.

7. Conclusion

The activities this report has examined, and the report itself, do not represent the full range of sustainability and SDG work undertaken by United Fresh. The activities of United Fresh also do not represent the full range of activities occurring in the fresh produce industry within New Zealand, as other industry participants have their own sustainability activities which they are undertaking.

What this report does represent, however, is the first critical examination of United Fresh's activities from an internal perspective, which has identified the challenges to implementation, as well as opportunities to extend United Fresh's sustainability work into additional areas.

This report also showcases some of the difficulties experienced by a private organisation in attempting to implement sustainability efforts within the United Nations framework, which is primarily focused on assisting developing countries, and which is lacking in many indicators relevant to private organisations or industry.

Finally, the report shows how a legal framework for governance and management can be utilised to create a holistic assessment framework, to examine the effectiveness of implementing activities such as the SDGs, in a best practice manner.

The findings of this report offer United Fresh, the New Zealand Fresh produce industry, and other horticultural/agricultural industry associations, an opportunity to examine and reflect on current sustainability management practices, and to consider how they might best continue their sustainability management practices, in the years to come.

Neither United Fresh, nor myself, have any intention of stopping our work with the SDGs. For myself, this report does not represent the beginning, or end, of my sustainability work. Instead, it represents a point of critical reflection, generating learnings of past action, to shape the pathways for future action.

Sustainability is an enormous topic to consider. And, even while smaller, so too is the scale of what the SDGs cover. Hopefully, this report acts as a small window into showing how an organisation can implement the SDGs within the constraints placed upon them, and act as guidance to those looking to improve their sustainability efforts with better management and implementation practices.

Supplementary Appendix: TAG SDG related Activities

As discussed in the main body of this report, I have chosen to assess the individual projects for United Fresh separately to my high-level analysis, due to the below factors:

- Individual activities and projects are grouped and assessed at a high level, based on the internal management framework categorisation used by TAG.

While all the tasks and activities discussed here relate to sustainability in general, for the purposes of United Fresh's management requirements, these are grouped into pre-defined core focus areas. For example, this means that all activities related to the sustainable use of refrigerant gases, phytosanitary gases, and other gaseous chemicals utilised by the industry, are grouped, and managed as the category "Industrial Gases".

However, where tasks and activities do not fall into the categories currently defined by United Fresh, but are related to sustainability, or have sustainability as their core focus, the category "Sustainability" has been used by United Fresh. This is therefore a catchall category for those sustainability projects not grouped elsewhere in the United Fresh system.

- Work not currently specifically related to sustainability, or the SDGs, was excluded. For example, while TAG may be engaging with regulators and standards bodies on the definition of concepts and ideas, and this work will eventually lead into activities that are sustainability related, the current work is technical, and not sustainability focused, and therefore excluded.
- Work which involved sustainability, or the SDGs, which was progressed by TAG, but did not involve myself in a significant manner, was excluded. While the overall scope of work completed by TAG that relates to the SDGs is larger than shown here, as these other activities are not relevant to my practicum work, these have been excluded. For example, while I discuss my work on progressing the SDGs with Food Safety activities in my Activity Analysis, this only represents the SDG related work in which I have been involved, and excludes several other activities in which I had limited to no involvement, such as the post-Cyclone Gabrielle project related to assessing the food safety implications of crop being contaminated by the resulting flood waters (Confidential Internal Documentation, see as examples Summary Of Proposed Flooded Land Soil Risk Assessment, 15 August 2023).
- Each category of sustainability activities is discussed here within the context of:
 - The rationale for this being a topic that TAG covers. The rationale used here will be the rationale presented to the United Fresh Executive Committee in the internal document, the TAG Annual Activity Report (Confidential Internal Report, see as examples United Fresh Technical Advisory Group Annual Report, February 2023), which is the rationale the work is assessed on as part of United Fresh's governance

requirements.

- The manner in how TAG considers this topic related to the most relevant 3 SDGs, from the perspective of TAG. While United Fresh, and in particular TAG, have held internal discussions on the SDGs, and been able to determine that, at a broad scale, every topic covered by TAG relates to all SDGs (Confidential Internal Documentation, see as example email 19 January 2023), for the purpose of this analysis, I will only be listing the top 3 SDG linkages.
- A discussion of some of the more significant activities performed within this category in which I participated, and how their outcomes were intended to result in more sustainable practices.
- How I believe each topic relates to my selected targets.
- The work has been assessed, within the analytical framework I have developed, as to whether this activity advanced the SDGs as a whole, and the selected targets in particular.

Biosecurity

Rationale, per United Fresh (Confidential Internal Reports, see as example United Fresh Technical Advisory Group Annual Report, February 2023), 2023)	<i>“The domestic and export fresh produce industries are intrinsically linked. The emergence of any new pests and diseases threatening horticultural exports impacts on the domestic produce industry’s ability to effectively and efficiently distribute produce, as inevitably MPI will introduce regulatory movement restrictions. An inability to control or eradicate any pest or disease creates further strategic implications.”</i>
SDG relationship	United Fresh believes that its work in this category most closely matches with the three listed SDGs due to the following factors (Confidential Internal Documentation, see as example email 19 January 2023): • SDG 2: Crop loss due to biosecurity threats reduce the availability of food, threaten food supply chains, and reduce food security (Cook et al., 2011). This threatens access to sufficient supplies of nutritious fruits & vegetables to manage healthy diets. • SDG 3: Non-communicable diseases, which form a part of the work programme for SDG 3, can be affected by diet and nutrition (Afshin et al., 2014). Given this, ensuring the security of the food supply is not impacted by crop loss due to pests & diseases, and that global supply chains need to be able to ensure food reaches the consumer, sustainable practices require a strong biosecurity response to maintain access to healthy foods worldwide. • SDG 12: the management of natural resources, and the management of food waste, form core concepts with the targets of SDG 12 (United Nations, 2015). Crop loss due to pests & diseases is a well understood phenomenon (Walker, 1986), as is the loss of resources used to grow this food, which reduces resource efficiency (Lucas, 2011). Managing biosecurity therefore assists in resource efficiency at the production stage, and reduces post-harvest losses to food waste.
Selected Activities	My work with TAG has involved one significant activity within the Biosecurity space related to the SDGs within the last 5 years: Returnable Plastic Crates (RPCs) & Disease Transmission. <i>“Returnable Plastic Crates (RPCs) are an integral part in moving produce both domestically and internationally between the different steps of the supply chain. In New Zealand they are predominantly used to transfer produce within domestic supply chains. Disruption to RPC supply or distribution would have a severe impact on fresh produce distribution.”</i> (Inacio, Arts, and Maurer, 2022) In 2021, Tomato Rugose Virus and Pepino Mosaic Virus were identified by United Fresh members as viruses of concern to their supply chains (Confidential Internal Meeting Minutes, May 2021). The United Fresh members were <i>“concerned about the ability of RPCs to spread viruses along their supply chains”</i>, and the potential processes by which the RPCs would need to be managed to prevent RPCs becoming a disease vector. Several of the initially proposed solutions were identified by the TAG team as economically and/or physically infeasible, requiring alternate solutions (Confidential Internal Meeting Minutes, May 2021).

	The TAG team worked with the concerned members, as well as the RPC companies who are also United Fresh members, to discuss managing the biosecurity risk posed by these viruses. Following these discussions, the TAG team analysed literature on international best practice for crate washing, and published a <i>“Research and Knowledge Compilation”</i> document for industry (Inacio, Arts, and Maurer, 2022), summarising the key findings of the most pertinent research. This generated 9 recommendations for industry to improve the biosecurity processes within the fresh produce RPC management system, in a manner that supports the long-term sustainability of the fresh produce supply chains within New Zealand. My role within this project was to assist in the coordination of meetings with the United Fresh members to discuss the biosecurity implications, oversight of the research and analysis process, editing & proofing of the final document, and managing the publication & dissemination of the final document to United Fresh members. Further work following the publication of the document also involved the coordination and management of the technical expert’s communications to industry, via presentations, newsletters, and meetings.
Relationship to Targets 9.1, 9.4, and 12.2	• 9.1: Target 9.1 requires <i>“quality, reliable, sustainable and resilient infrastructure, including regional and transborder infrastructure”</i> (United Nations, 2015). United Fresh is of the view that maintaining the current quality and reliability of the food supply chain infrastructure, both within New Zealand, and globally, to ensure its sustainability, requires New Zealand to consider biosecurity as part of its SDG strategy (Maurer, Lawes, and Inacio, 2023). I therefore consider my work for TAG as helping progressed this Target. • 9.4: This target requires <i>“By 2030, upgrade infrastructure and retrofit industries to make them sustainable, with increased resource-use efficiency”</i> (United Nations, 2015). For United Fresh, this applies to New Zealand biosecurity, as upgrading and refitting our industry & infrastructure should include the consideration of biosecurity threats and implications, as any biosecurity incursion event within New Zealand can cause significant impacts, as shown by the Queensland Fruit Fly detections in Auckland, (MPI, n.d.-a; MPI, n.d.-b), and the nationwide Mycoplasma Bovis outbreak (Mycoplasma bovis Governance Group, 2021). I therefore consider the work I have participated in within the TAG Biosecurity activities to have progressed Target 9.4. • 12.2: This target is <i>“By 2030, achieve the sustainable management and efficient use of natural resources”</i> (United Nations, 2015). United Fresh is of the view that biosecurity threats would significantly impact on the resources required to grow and deliver food to the consumer, given the crop/animal losses and food waste that would result, and the resources used to grow the plants and food that is now inedible (Confidential Internal Reports, see as examples Risk Ranking Outcomes To Prioritise Fresh Produce Safety Research, December 2021). In addition, a biosecurity event would require reacting with pest management systems, which would require further resource expenditure. Given this, from United Fresh’s perspective, and my own , biosecurity activities are an obvious topic to consider as working on achieving target 12.2 (personal communications, see as examples February 2023).

Food Safety

Rationale, per United Fresh (Confidential Internal Reports, see as example United Fresh Technical Advisory Group Annual Report, February 2023), 2023)	<i>“Consumers want safe food. Regulators and retailers hold producers and distributors accountable for providing safe food, and all parties involved understand the need for this. United Fresh members’ interest lies in maintaining and increasing consumption of fresh produce. This interest is compromised every time a fruit or vegetable product is pointed at, or identified, in a Food Safety incident.”</i>
SDG relationship	United Fresh believes that its work in this category most closely matches with the three listed SDGs due to the following factors (personal communications, see as examples February 2023): • SDG 2: the targets of SDG 2, in United Fresh’s views, are severely threatened if the food supply chain is compromised by foodborne illnesses (personal communications, see as examples February 2023), as this would restrict or prevent access to food for many, and the resulting hunger and malnutrition that could arise (Havas & Salman, 2011). Given this, United Fresh believes that all SDG 2 targets are supported by a robust food safety strategy (personal communications, see as examples March 2023). • SDG 3: with 600 million incidences of foodborne disease and 420,000 deaths each year (Lee & Yoon, 2021), United Fresh is of the view that ensuring all consumers have access to safe food will help ensure progress towards the SDG 3 (personal communications, see as examples March 2023), including SDG targets 3.2 by reducing child mortality due to foodborne illness, 3.3 by helping reduce the spread of communicable diseases, 3.9 due to contamination related deaths, and 3.d, by strengthening the capacity of countries to manage and reduce the risks related to foodborne illness. • SDG 8: United Fresh’s view is that Food Safety should form a strong part of SDG 8, given that agriculture forms an intrinsic part of ensuring sustainable industry and economic growth (personal communications, see as examples February 2023). A lack of trust in food safety is driving consumers away from some foods (Grace, 2015), while improvements in food safety across the supply chain can reduce the loss of food product and enable access to additional export markets (Henson, 2003). With improved food safety systems in place, United Fresh is of the view that food-based industries would be better able to enable economic growth and productivity, improve job creation & entrepreneurship, increase resource efficiency, and meet the full suite of requirements attached to the Targets of SDG 8 (personal communications, see as examples February 2023).
Selected Activities	My work with TAG has involved the following significant activities within the Food Safety space related to the SDGs within the last 5 years: • COVID-19 work: During the COVID-19 Pandemic, United Fresh received requests from its members to maintain an active activity of monitoring and analysing published literature and scientific information around COVID-19, to identify and

	summarise all information relevant to the industry into regular member's newsletters (personal communications, see as examples February 2023). During this period, I was responsible for managing the activities occurring, which included coordinating and assisting the Food Safety Technical Expert in identifying relevant literature, followed by analysing these documents for relevant information, before summarising it into newsletters suitable for industry publication (Member Update Emails, see as example 11 October 2023). This involved coordinating myself, the Technical Expert, and other staff members, research, analytics, document writing, proof-reading, and technical review, and managing the dissemination of completed documents. - Recycled Packaging Guidelines: The New Zealand Food Safety Science and Research Centre (NZFSSRC) published 6 papers examining the current state of the recycled packaging industry in New Zealand, and in particular, cardboard, and plastic packaging (NZFSSRC, 2022)., The fresh produce industry, and United Fresh, supported this project as interested stakeholders. Following the release of these reports, I was responsible for working with the TAG Food Safety Technical Expert to review and summarise the reports into a format and language understandable by the average industry lay-person (United Fresh, 2022). - Industry Presentations & Communications: In addition to the projects in which I had direct and ongoing management, the TAG team has also completed almost a dozen other Food Safety related projects within the 2017-2023 time period (Confidential Internal Documentation, see as example NZ Food Safety Science & Research Centre Horticulture Taskforce Meeting Minutes 14 February 2023). While not directly engaged in the delivery of these projects, my role for TAG had me managing and overseeing the coordination of staff for project delivery, as well as monitoring project timeframes & schedules. For the completion of major milestones in each of these projects, or at project completion, the TAG team provides the industry with communication and engagement opportunities. My role for these was the management and oversight of communications materials development (e.g., PowerPoints, newsletters, and summary sheets), and assisting in the delivery of these communications to industry via webinars, individual meetings, email broadcasts, and at industry events (personal communications, see as example 5 August 2023).
Relationship to Targets 9.1, 9.4, and 12.2	9.1: Food Safety is a recognised part of food supply chains (Beulens et al., 2005). The global harmonisation of food safety standards, including via bodies such as Codex Alimentarius, was intended to ensure equitable access for all to safe food (Aruoma, 2006). Finally, food safety has been noted as <i>"the most distressing threat for human health and economic growth"</i> (Aktar, Sarker, and Hossain, 2014). Food Safety is therefore, in my view, a perfect representation of an activity which progresses SDG Target 9.1, given that the Target uses the words <i>"infrastructure"</i>, <i>"equitable access"</i>, and <i>"economic development"</i>, when it states, <i>"Develop quality, reliable, sustainable and resilient infrastructure, including regional and transborder infrastructure, to support economic development and human well-</i>

	<i>being, with a focus on affordable and equitable access for all</i>" (United Nations, 2015). • 9.4: Target 9.4 discusses the need to <i>"upgrade infrastructure"</i>, requires adoption of <i>"environmentally sound technologies and industrial processes"</i>, and <i>"taking action in accordance with their respective capabilities"</i> (United Nations, 2015). Given Beulen's (2005) recognition of food safety as a part of the food supply chain infrastructure, the work of TAG in this area is therefore, in my view, assisting in the knowledge space required to help <i>"upgrade infrastructure"</i>, while also ensuring that, in cases such as recycled packaging, food safety issues do not impinge on the ability of the industry to adopt <i>"environmentally sound technologies and industrial processes"</i>. Additionally, as TAG helps disseminate relevant information across the industry to ensure industry is aware of the latest learnings, this helps ensure that our industry has the knowledge to be able to act, <i>"in accordance with their respective capabilities"</i>. • 12.2: This Target is <i>"By 2030, achieve the sustainable management and efficient use of natural resources"</i> (United Nations, 2015). With food loss and food waste through the food supply chains contributing to significant resource inefficiencies (Hodges, Buzby, and Bennet, 2011), it is the view of United Fresh, as well as myself, that <i>"sustainable management and efficient use of natural resources"</i> in the fresh produce industry involves ensuring an appropriate food safety system is present and active, in order to help improve the sustainable uses of natural resources used to grow our food. Food Safety is therefore considered by United Fresh and myself as an appropriate pathway towards achieving SDG Target 12.2, within the fresh produce industry.
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Traceability

Rationale, per United Fresh (Confidential Internal Reports, see as example United Fresh Technical Advisory Group Annual Report, February 2023), 2023)	<i>“Produce supply chains are becoming more complex, as well as diverse, and new channels continue to emerge. Regulatory and retailer driven residue hurdles continue to be raised, and the consumer is increasingly requesting more accurate and timely information about product origin and the treatments it has been exposed to. All this makes traceability an essential component of good business practice for the produce industry, rather than an optional extra.”</i>
SDG relationship	United Fresh believes that its work in this category most closely matches with the three listed SDGs due to the following factors (personal communications, see for example February 2023): • SDG 2: This SDG has the goal of <i>“End hunger, achieve food security and improved nutrition and promote sustainable agriculture”</i> (United Nations, 2015). United Fresh holds the position that, while not able to end hunger by itself, traceability in food supply chains is a well-recognised method of assisting in food security and sustainable agriculture (personal communications, see as example February 2023). United Fresh holds this position on the basis of the extensive the literature on this topic dating back many years (Wilson & Clarke, 1998; Töyrylä, 1999; Latouche, Rainelli, and Vermersch, 1998; Unneveher & Hirschhorn, 2000; Opara & Mazaud, 2001). United Fresh therefore considers traceability in food supply chains an important aspect of SDG 2. • SDG 9: with the stated aim of <i>“Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation”</i> (United Nations, 2015), United Fresh takes the position that traceability can achieve SDG 9, Given the wide body of evidence linking traceability to the SDG 9 concepts (personal communications, see as example February 2023). Traceability is a known factor in resilient infrastructure for food supply chains (Peck, 2005; Stone, Rahimifard, and Woolley, 2015; Dunning, Bloom, and Creamer, 2015), as well as innovation (Caro, Ali, Vecchio, and Giaffreda, 2018; Wang et al., 2021; Lin et al., 2020; Zhou & Xu, 2022). • SDG 17: SDG 17 is <i>“Strengthen the means of implementation and revitalize the Global Partnership for Sustainable Development”</i> (United Nations, 2015). While United Fresh is of the view that this definition, and the official Targets (United Nations, 2015) are overly narrow, United Fresh takes the position that the alternate label for this SDG, <i>“Partnership for the Goals”</i> (Global Goals, n.d.; UNEP, n.d.) is an appropriate concept covered within this SDG (personal communications, see as example February 2023). Therefore, United Fresh’s position is that the fresh produce industry, via partnerships both domestic and global, can achieve sustainability and the SDGs.
Selected Activities	My work with TAG has involved the following two significant activities within the Traceability space related to the SDGs within the last 5 years: • Effective Fresh Produce Traceability Systems Project: This project was the result of a successful application from United Fresh to MPI for a Sustainable Food & Fibre

	Futures Project (Confidential Documentation, Effective Fresh Produce Traceability Systems Sustainable Farming Fund Application, 14 September 2017). The objective for this project was <i>“to assist growers, packers, marketers and retailers in the domestic fresh produce supply chain to understand how they can improve their internal Traceability systems while ensuring a more robust streamlined external Traceability framework at the same time”</i> (Confidential Documentation, Effective Fresh Produce Traceability Systems Sustainable Farming Fund Application, 14 September 2017). This project involved studying the traceability of loose and prepacked produce within New Zealand supply chains, and developing a set of guidelines for industry on how to implement an effective fresh produce traceability system. The final New Zealand <i>“Produce Industry Traceability Guidelines”</i> were released in May 2021, and were based around implementing traceability using the globally recognised GS1 standards (United Fresh, 2021). My role in this project was three-fold. During the literature research-based stages of this project, I assisted in the research, analysis, and summarisation of information, followed by the drafting and editing of the literature review. In the middle stages of the project, I assisted in the administration and management of project resourcing, coordination of staff and meetings, and engagement with industry to assist in the planning and implementation of the traceability trials. Finally, during the guidelines’ development and release, I assisted in the writing, editing, publication, and release of the guidelines in a format usable by industry. Trust Alliance NZ: Trust Alliance New Zealand (TANZ) is <i>“a non-profit industry consortium governed and operated by its members... [Who] provide tools and protocols to enable a trusted data network. [They] believe in a decentralised approach, to enable easy data capture, and protection & permissioned sharing across the primary sector”</i> (TANZ, n.d.-a). United Fresh and TANZ have reciprocal memberships within each other (Confidential Internal Documentation, Memorandum of Understanding, 11 April 2023). Traceability systems have been identified by TANZ as enabling an understanding of the <i>“ethical, sustainable and environmental impacts of what [consumers] buy”</i>, and by United Fresh as <i>“the future direction that the industry would be driven towards by regulations and technology solutions”</i> (personal communications, 12 October 2022), regardless of whether such future systems are TANZ systems, or another suppliers. As the United Fresh representative to TANZ, my role has involved attending TANZ Member Meetings, in order to gain a technical understanding of the progress of the TANZ tools and digital framework, to analyse and identify how such a framework might be implemented within New Zealand, or globally, either as industry-driven systems, or via regulations. I also work with TANZ to understand how the TANZ system or similar systems would need to be designed to work appropriately within the fresh produce industry, and how this would be affected by regulations.
Relationship to Targets 9.1, 9.4, and 12.2	9.1: The traceability systems of GS1 and TANZ are focused on meeting global needs for traceability to ensure the security of supply chains (Confidential Documentation, see as example Meeting Protocol – Meeting between Trust Alliance & United Fresh,

	23 June 2023). Given this, and the role traceability plays in sustainable infrastructure (Peck, 2005; Stone, Rahimifard, and Woolley, 2015; Dunning, Bloom, and Creamer, 2015), United Fresh is of the view that its traceability work progresses this target, within the requirements for <i>“quality, reliable, sustainable and resilient infrastructure, including regional and transborder infrastructure”</i> (United Nations, 2015). • 9.4: Traceability is acknowledged as an important part of improving sustainability in food supply chains (Islam, Manning, and Cullen, 2021; Zhou, Pullman, and Xu, 2022), as well as supporting resource efficiency (Anastasiadis, Manikas, Apostolidou, & Wahbeh, 2022). Given this, it is the position of United Fresh that traceability most certainly links to SDG Target 9.4 (personal communications, see for example February 2023), as implementing traceability is within our <i>“respective capabilities”</i>, provides <i>“increased resource-use efficiency”</i>, and assists in <i>“clean and environmentally sound technologies and industrial processes”</i> (United Nations, 2015). • 12.2: <i>“Sustainable management and efficient use of natural resources”</i> (United Nations 2015) is most certainly, in United Fresh’s view (personal communications, see for example February 2023), achieved via traceability, thanks to the improvements in resource efficiency it enables (Moe, 1998; Alfaro, & Rábade, 2009; Ringsberg, 2015; Stranieri, Cavaliere, and Banterle, 2016; Jagtap and Rahimifard, 2019), and its impact on sustainability (Banks & Bristow, 1999; Pretty, 1999; Pretty, 2000; Mol & Oostveer, 2015). Given this, United Fresh’s position is that traceability achieves SDG Target 12.2 (personal communications, see for example February 2023).
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Industrial Gases

Rationale, per United Fresh (Confidential Internal Reports, see as example United Fresh Technical Advisory Group Annual Report, February 2023), 2023)	<i>“Our industry relies on a variety of industrial gases for a range of tasks along the fresh produce supply chain, including refrigeration, fumigation, and modified atmospheric storage during shipping. Changes to regulations surrounding these industrial gases can have severe impacts on our industry’s ability to deliver quality product to our customers and consumers. Global environmental agreements to which New Zealand is a signatory require New Zealand, and New Zealand industries, to change the ways some industrial gases are managed, making it imperative that global trends surrounding industrial gases are considered for the potential future impact on our industry.”</i>
SDG relationship	United Fresh believes that its work in this category most closely matches with the three listed SDGs due to the following factors (personal communications, see for example February 2023): • SDG 9: United Fresh’s view on SDG 9 and the relationship with industrial gases, is that there is a strong linkage (personal communications, see for example February 2023). The Indicator 9.4.1, for example, refers to <i>“CO₂ emission per unit of value added”</i> (United Nations, 2015), with industrial gases that create CO₂ equivalent greenhouse gas emissions and health & safety risks being a part of TAG’s activities (Lawes & Maurer, 2018, Lawes & Arts, 2019-a; Lawes & Arts, 2020; Lawes, Baptist, and Maurer, 2023). TAG’s work on industrial gases is also considered by United Fresh (personal communications, see for example February 2023) to be part of assisting our industry towards <i>“quality, reliable, sustainable and resilient infrastructure”</i> (United Nations, 2015), and supporting the economic development of our industry in a sustainable manner, by ensuring <i>“clean and environmentally sound technologies and industrial processes”</i> (United Nations, 2015) • SDG 12: This target is considered particularly relevant to United Fresh’s implementation of the SDGs (personal communications, see for example February 2023), as a result of Target 12.4, <i>“achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil in order to minimize their adverse impacts on human health and the environment”</i> (United Nations, 2015). United Fresh’s work in the sustainability space around industrial gases has been about ensuring the gases used by the industry have the least impact on human health and the environment, as shown by several of the TAG activities in this space (Lawes & Maurer, 2018, Lawes & Arts, 2019-a; Lawes & Arts, 2020; Lawes, Baptist, and Maurer, 2023). • SDG 13: Given that SDG 13 is <i>“Take urgent action to combat climate change and its impacts”</i> (United Nations, 2015), that SDG13.3 is <i>“improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning”</i> and that indicators 13.2.1 and 13.2.2 refer to <i>“Number of countries with nationally determined contributions, long-term strategies, national adaptation plans”</i> and <i>“Total greenhouse gas emissions per year”</i>, United Fresh’s position is that the TAG work in engaging with the industry and government to help transition the industry, and New Zealand, to industrial

	gases with lower greenhouse gas emissions, and in a manner that forms a part of the New Zealand long-term strategy around climate change, this work is most suitably linked with SDG 13.
Selected Activities	My work with TAG has involved the following significant activities within the Industrial Gases space related to the SDGs within the last 5 years: Methyl Bromide as a Phytosanitary Treatment: United Fresh became involved in the Environmental protection Authority (EPA) reassessment of Methyl Bromide (MB) as a phytosanitary treatment in 2019, due to the following rationale: <i>“MB is a highly toxic colourless and odourless gas... used as a fumigant. MB is an Ozone Depleting Agent... regulated internationally after the signing of the London Amendment to the Montreal Protocol ... which mandated countries reduce MB use to zero, except for phytosanitary requirements where acceptable fumigation replacements do not exist...</i> <i>The majority of product fumigated with MB within New Zealand are wood products... However, both imported and exported produce can also require MB treatment as part of phytosanitary requirements, which are regulated by the Ministry for Primary Industries (MPI) or the importing countries. As such, any phase-down of MB could affect the New Zealand produce industry’s ability to receive or export produce.”</i> (Lawes & Arts, 2019-b). United Fresh made several submissions to the EPA, both in oral and written formats, to ensure that the final decision was made with an understanding of the likely impacts on New Zealand’s ability to import fresh produce. My role in this work was the management of the research and analysis of data related to MB and fresh produce, followed by acting as primary author for submissions to the EPA outlining United Fresh’s findings of the likely impacts, and our recommendations for ensuring fresh produce imports could continue (Lawes & Arts, 2019-a; Lawes & Arts, 2019-b). Regulation of Health & Safety Risks Associated with Toxic or Flammable Gases: This activity began in 2018, and related to the New Zealand Government’s <i>“investigating options for Health & Safety regulations related to the certification of competency for technicians and businesses prior to installing, maintaining, or replacing refrigerant systems that carry flammable or toxic refrigerants”</i> (Lawes & Maurer, 2018). As these gases are installed, maintained, and replaced by professional technicians, United Fresh engaged with The Institute of Refrigeration Heating & Air Conditioning Engineers of New Zealand Inc. (IRHACE, n.d.) to understand the likely impacts on health & safety, as well as the different potential implications for our industry (personal communications, see for example February 2023). TAG then engaged with the New Zealand government on this topic between 2018 and 2020, analysing in depth the likely impacts of the multiple sets of proposed regulations on the use of toxic and flammable gases, and how these regulations could affect our industry (Lawes & Maurer, 2018; Lawes & Arts, 2020), as well as engaging with the industry and to outline the proposed, and final, regulations, their impact on our industry, and the future actions our industry would need to take. My role in this work was to research and analyse the proposed regulations, and their impact on industry, to identify the most realistic and sustainable options that

	would not lead to increased health & safety risks across the fresh produce industry. This included meeting with IRHACE technical experts to discuss and examine how the regulations would affect different practical scenarios, engaging with industry to understand their current refrigeration systems and replacement pathways, and summarising these findings into reports for the industry. Following this investigative work, I was then the primary author for the resulting submissions to Government, providing the government with United Fresh’s submissions on the expected impacts to our industry of the proposed regulations (Lawes & Maurer, 2018; Lawes & Arts, 2020). • Fluorinated Gases (‘F Gases’): in 2022, the Ministry for the Environment released a request for submissions on the “proposed measures to reduce the environmental impact of F Gases” (This consultation was aimed “to reduce the contribution of F-gases to Aotearoa New Zealand’s greenhouse gas emissions, in recognition of the negative effect these substances have on the climate.” MFE, 2022). As United Fresh members are major users of these gases in New Zealand (Lawes, 2022), TAG engaged with MFE on this topic, making a submission that examined the strategic implications for our industry if F Gases were to be regulated in the manner proposed. My role in this was the management and coordination of all aspects of this topic, including research, analysis, and authoring the submission to MFE, outlining the expected impacts from a technical viewpoint.
Relationship to Targets 9.1, 9.4, and 12.2	• 9.1: An industry that relies on non-sustainable technology & systems such as greenhouse gas-based refrigerants, is in United Fresh’s view, not “<i>reliable, sustainable and resilient infrastructure</i>” under SDG Target 9.1 (United Nations, 2015). Given this, United Fresh took the position that our industry should engage with the government, as well as industrial gas technical experts, to ensure that our industry, and New Zealand, transition to more sustainable systems, as part of our progress towards enabling sustainable infrastructure within our industry. • 9.4: the United Nations indicator for 9.4, 9.4.1 refers to “<i>CO₂ emission per unit of value added</i>” (United Nations, 2015). As several of TAG’s industrial gas activities relate to greenhouse gases with CO₂ equivalent emissions, United Fresh’s work in this area in replacing these gases with sustainable replacements should meet the requirement under SDG 9.4 to “<i>retrofit industries to make them sustainable</i>” with these industrial gas system retrofits being “<i>clean and environmentally sound technologies and industrial processes</i>” (United Nations, 2015). • 12.2: United Fresh’s position is that the environment is a natural resource in and of itself, and therefore needs to be managed appropriately (personal communications, see for example February 2023). Under this position, SDG Target 12.2 is perfectly aligned with TAGs work on industrial gases, as the “<i>sustainable management and efficient use of natural resources</i>” (United Nations, 2015) required means that any systems or processes that do not enable a sustainable environment would fail to manage the environment appropriately. Therefore, implementing sustainable industrial gas systems that reduce our impact on the environment can be considered becoming more efficient of our use of the environment as a natural resource.

Sustainability

Rationale, per United Fresh (Confidential Internal Reports, see as example United Fresh Technical Advisory Group Annual Report, February 2023), 2023)	<i>"The produce industry has an intrinsic appreciation for Sustainability, similar to other perishable food sectors. At times, Sustainability concerns and commercial targets are not necessarily aligned, or, in addressing Sustainability concern, e.g., the use of plastic bags, it is entirely possible to create another one (increased reliance on paper bags). There is a general understanding that we can do better as an industry, and that we must do better, because of increasing consumer focus in this area.</i> <i>The United Nations' Sustainable Development Goals are the blueprint to achieve a better and more sustainable future for all. They address global challenges, including those related to poverty, inequality, climate, environmental degradation, prosperity, peace, and justice. The target to achieve these goals is 2030.</i> <i>The New Zealand government has committed the country to the United Nations Sustainable Development Goals, and United Fresh has adopted these Sustainable Development Goals to provide a whole of industry sustainability framework. Prioritising these goals is the starting point for our industry's journey to sustainability."</i>
SDG relationship	United Fresh believes that its work in this category most closely matches with the three listed SDGs due to the following factors (personal communications, see for example February 2023): • SDG 8: a core part of SDG is "sustained, inclusive and sustainable economic growth" (United Nations, 2015). United Fresh understands that sustainable economic growth cannot occur within our industry if the fresh produce industry does not follow sustainable practices. United Fresh is of the view that, in order for New Zealand, and the New Zealand fresh produce industry, to meet the SDGs, our sustainability efforts must deliver on SDG 8's targets, including 8.1, "Sustain per capita economic growth in accordance with national circumstances", 8.2 "higher levels of economic productivity through diversification, technological upgrading and innovation", and 8.4 "Improve progressively, through 2030, global resource efficiency in consumption and production and endeavour to decouple economic growth from environmental degradation", (United Nations, 2015) given how these targets align with United Fresh's work (personal communications, see for example February 2023). • SDG 9: Work on activities within the TAG 'sustainability' category has been determined by United Fresh to be associated with SDG 9, on the basis of how the TAG work supports SDG 9 and the relevant targets (personal communications, see for example February 2023). To United Fresh, the TAG work is intended to "Develop quality, reliable, sustainable and resilient infrastructure", "Promote inclusive and sustainable industrialization", "upgrade infrastructure and retrofit industr[y] to make [it] sustainable", and to "Enhance scientific research" and "upgrade the technological capabilities" of the fresh produce industry, which aligns the work with the high-level concepts captured in SDG targets 9.1, 9.2, 9.4, and 9.5. • SDG 12: TAG activity within this category has included attempting to minimise plastic use by the industry, increase industry awareness and reporting around greenhouse gases, domestic & international engagement on building a more

	sustainable industry, and minimising industry waste, amongst other topics (personal communications, see for example February 2023). For United Fresh, this work has been implemented as part of the drive towards enabling increased sustainable production by the industry, and improved sustainable consumption by our consumers. This aligns with the stated aims of SDG targets 12.2 through 12.6. United Fresh therefore considers this work to be aligned with SDG 12.
Selected Activities	My work with TAG has involved the following significant activities within the Sustainability space related to the SDGs within the last 5 years: “Hard to recycle Plastics Phaseout”: in 2020, the Ministry for the Environment released a consultation document looking at phasing out the use of “single-use plastics” (MFE, 2020). This document sought feedback on two proposed methods of reducing the use of “<i>hard to recycle plastics</i>”. One category of plastics included within the proposals were “<i>non-compostable fruit labels</i>”. United Fresh engaged with the government through the submissions process, as well as direct engagement with the ministry to determine an appropriate pathway that would enable an effective transition to compostable labels (Confidential Documentation, see for example Letter to Ministry for Environment, 10 October 2022). This engagement included formal letters, meetings, consultation with technical experts from industry on technical matters, communicating the final decision to industry, and assisting industry in understanding how to transition their label use to compostable labels. My role in this activity was to coordinate and manage the response from TAG to the Ministry, which involved topic research & analysis, coordinating TAG and industry members, writing formal responses, and communicating with industry on the outcomes. United Nations Food Systems Summit: in 2020, the UN Secretary-General, António Guterres, called “<i>on all world leaders to take part in a historic Summit... that will help establish the future direction for food systems... [to] reflect the increasing recognition that transforming food systems is central in efforts to achieve all the 17 Sustainable Development Goals (SDGs) by 2030</i>” (United Nations, 2020). This “<i>Food Systems Summit</i>” involved a series of Dialogues held globally, in 3 groups: those held by the United Nations, those held by Governments, and those held by “<i>self-appointed individuals or organizations independent from national authorities</i>”, with this third category being called “<i>Independent Dialogues</i>”. United Fresh made the decision to host an independent Dialogue in partnership with Tāhuri Whenua National Māori Vegetable Growers Collective, to discuss “<i>The Future for Fruit & Vegetable Kai Systems in Aotearoa New Zealand</i>” (United Fresh, 2020). This Dialogue involved more than 50 participants from across New Zealand, discussing how the Actions proposed by the United Nations in the Food Systems Summit could be achieved within the New Zealand fresh produce industry, and how the industry could implement the SDGs. The official feedback from the Dialogue was then presented to the United Nations for inclusion in their synthesis report of the entire Summit.

	As this was an independent Dialogue, neither the United Nations or the New Zealand Government was involved. As such, the TAG team managed the entire Dialogue, from invitations to close-out. My role in this was management of the entire process, including invitations, scheduling, document preparation, creation of the PowerPoint, and assisting in the holding of a breakout group. • Sustainable Development Goals Industry Guidelines: in January 2023, United Fresh determined that there was still some confusion and hesitancy in the fresh produce industry around how the SDGs should be implemented at an individual business level (personal communications, see for example February 2023). This confusion was considered to be problematic, as it would delay us from being able to implement the SDGs effectively and efficiently. Given this, United Fresh approved the development of a guideline document by the TAG team, with the intention of assisting individuals and businesses with understanding how they could implement every SDG in their part of the fresh produce industry (Confidential Internal Documentation, see for example email 19 January 2023). These guidelines were published in July 2023 as <i>"Towards Achieving the United Nations Sustainable Development Goals: Guidelines for the New Zealand Fresh Produce Value Chain 2023"</i> (Maurer, Lawes, and Inacio, 2023). The Guidelines are publicly available at https://unitedfresh.co.nz/technical-advisory-group/united-nations-sustainable-development-goals, and have been disseminated to all United Fresh members. Following publication of the Guidelines, the TAG team has increased its engagement with industry on the SDGs, as well as the Guidelines. These Guidelines have now been provided to multiple parties outside United Fresh membership, and feedback has been consistently positive (personal communications, see as example 5 August 2023). Due to the depth of engagement both within our industry and outside it, United Fresh is now in the process of considering and implementing further activities surrounding the Guidelines and the SDGs. My role in this activity was as technical expert for the SDGs, and as overall project management. I coordinated the writing of the document between TAG team members, consulted on technical details related to the SDGs, implemented & managed the final peer review, and assisted in the industry engagement post-publication. Post-publication engagement included meeting with industry members at the New Zealand Horticulture Conference 2023, a co-hosted Sustainability workshop being held in November 2023, between United Fresh and the Australian-based International Fresh Produce Association Australia New Zealand (IFPA-ANZ), and engagement with Government ministries. Further currently known Guidelines engagement work includes working with the International Federation of Produce Standards (IFPS) (https://www.ifpsglobal.com/) (IFPS, n.d.-a.), who are considering implementing their own version, using the United Fresh document as a foundation, and potential actions by several other industry & non-industry members, who cannot be
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	identified at this point in time (confidential personal communications, see for example February 2023).
Relationship to Targets 9.1, 9.4, and 12.2	• 9.1: United Fresh views its ‘sustainability’ activity as core to SDG 9.1. work on these activities was intended to help support a sustainable fresh produce industry, through a variety of pathways. The work on single-use plastics would enable a transition to a more sustainable industry, whilst the Dialogue and Guidelines were intended to help identify and develop actionable efforts for the industry, both domestically, and globally, to progress the SDGs. In doing so, the industry would therefore meet the <i>“develop quality, reliable, sustainable and resilient infrastructure, including regional and transborder infrastructure”</i> of SDG 9.1 (United Nations, 2015). • 9.4: as acknowledged previously in this report, United Fresh does not manufacture any goods or services. However, United Fresh is of the view that the <i>“upgrade infrastructure and retrofit industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes”</i> (United Nations, 2015) has been clearly and definitively covered by the activities here. These activities are not directly assisting United Fresh in becoming more sustainable in its activities. Instead, they are focused on enabling the industry as a whole, and as individual businesses, to have the knowledge and understanding of the SDGs required to implement effective actions. As the industry follows the actions set out in the pathways shown in the Guidelines document and Independent Dialogue, these actions will assist in resource efficiency, as well as with clean & environmentally sound technologies and processes. • 12.2: United Fresh’s position is that, in order for the industry to <i>“achieve the sustainable management and efficient use of natural resources”</i> (United Nations, 2015), it must understand the how and why from a technical perspective, that is relevant to industry (personal communications, see for example February 2023). This understanding is considered critical by United Fresh, as consistent feedback from industry has been in the vein of <i>“we want to follow the SDGs, and we want to be sustainable, but we don’t know exactly how to do so”</i> (personal communications, see as examples 6 August 2023). Given this, United Fresh’s view is that the work discussed here is critical to achieving SDG target 12.2, not because it directly achieves sustainable management, but rather, that it gives the tools and understanding to industry, to enable industry to implement the SDGs in a manner consistent with their work, in a more effective manner than attempting a top-down directed framework.

International Federation for Produce Standards (IFPS)

Rationale, per United Fresh (Confidential Internal Reports, see as example United Fresh Technical Advisory Group Annual Report, February 2023), 2023)	<i>"The International Federation for Produce Standards (IFPS) emerged in the 1990s, when national produce associations in the United States, Canada, Australia, and New Zealand realised that there was an urgent need to standardise the use of PLU numbers on a global basis. Today, membership is more extensive, and includes countries as diverse as Chile, the United Kingdom, the Netherlands, and Norway. The scope of IFPS engagement has also broadened, and now includes the portfolios of Chain Information Management, Product Identification, and Food Safety. New Zealand is an IFPS founding member and continues to contribute at the organisations executive level, with Hans Maurer currently serving as the New Zealand Director, and Chair of the Standardisation and Information Management Committee."</i>
SDG relationship	United Fresh believes that its work in this category most closely matches with the three listed SDGs due to the following factors (personal communications, see for example February 2023): • SDG 9: As with United Fresh, IFPS has also adopted the SDGs (IFPS, n.d.-b). In 2022, United Fresh participated in the IFPS sustainability Symposium (IFPS, 2022), in which United Fresh & the other IFPS members identified the primary priorities for the industry in meeting the SDGs and sustainability targets. These related to improving the sustainability of the industry through improved resource efficiency (matching SDG 9.4), promoting sustainable industrialisation of the industry (SDG 9.2), improving the resiliency of global fresh produce infrastructure (SDG 9.1) and research, innovation, and knowledge management to harmonise systems, to help measure sustainability progress better (SDG 9.5). Given this, United Fresh is of the view that its work with IFPS aligns with SDG 9. • SDG 12: United Fresh's position on SDG 12 and its work with IFPS is that, at minimum, Targets 12.1-12.7 can be clearly linked and aligned with the work of IFPS as a global standards body. IFPS is working to improve the sustainable consumption and production patterns in the fresh produce industry. IFPS has stated that <i>"Recognizing the importance of sustainability to the sector, sustainability has been included as the 4th pillar of IFPS in addition to Product Identification, Food Safety and Information Management and Standardisation."</i> (IFPS, n.d.-a.). the IFPS Sustainability Symposium Report Press Release (2023) notes that <i>"The symposium identified key areas where the industry can make a significant impact on sustainability, including waste reduction, water conservation, and responsible sourcing"</i>. This, to United Fresh and IFPS's view, aligns the work of IFPS and its member organisations, with SDG 12. • SDG 17: the description of SDG 17 is <i>"Strengthen the means of implementation and revitalize the Global Partnership for Sustainable Development"</i> (United Nations, 2015). IFPS is not directly aligned with several if the official UN Targets attached to SDG 17, which relate to tax & revenue collection (SDG 17.1), Official Development Assistance (SDG 17.2), debt sustainability (SDG 17.4), or investment promotion for least developed countries (SDG 17.5) (United Nations, 2015). However, United Fresh notes that the work of IFPS can be considered to meet SDG 17.13, <i>"enhance global macroeconomic stability"</i>, SDG 17.14, <i>"Enhance policy coherence for sustainable development"</i>, and SDG 17.16, <i>"Enhance the Global Partnership for Sustainable</i>

	<i>Development, complemented by multi-stakeholder partnerships that mobilize and share knowledge, expertise, technology and financial resources, to support the achievement of the Sustainable Development Goals in all countries, in particular developing countries". United Fresh believes that these aspects of SDG 17 are shown to be implemented into the framework of IFPS work by the official IFPS Objectives:</i> <i>"In conjunction with stakeholders in the industry to improve the supply chain efficiency of the fresh produce industry through developing, implementing and managing harmonised international standards.</i> <i>To act as a forum for comment and discussion on issues relating to international standards as they affect the produce industry.</i> <i>To make recommendations and advocate appropriate courses of action in relation to international standards that affect the produce industry."</i> (IFPS, n.d.)
Selected Activities	My work with TAG has involved the following significant activities within the IFPS space related to the SDGs within the last 5 years: Sustainability Committee Membership: in 2023, IFPS formally implemented a Sustainability Committee, to monitor and engage on sustainability topics relevant to the global fresh produce industry (personal communications, see as example email 14 November 2023). United Fresh was invited to nominate the New Zealand representative to the Committee, and nominated myself. This was accepted by IFPS, and I assumed this position in 2023 (personal communications, December 2023). During these Committee meetings, the Committee members discuss ongoing and future activities related to sustainability occurring within their country. During these discussions, global implications are often identified, or Committee members identify work in another country is of relevance to improving sustainability efforts within their own country. When this occurs, relevant information is shared, and IFPS members, or IFPS as a whole, may seek to engage further on topics. This ensures that learnings generated in one country are available in all IFPS member countries, and that, where necessary, the global fresh produce body can engage as one on topics of global import (personal communications, see for example November 2022). My work in this activity has involved presenting on United Fresh work to other IFPS members, working with other members to understand and engage as IFPS on global matters, and providing the United Fresh Executive with summaries of Committee meetings, outlining global fresh produce sustainability activities, their expected implications for New Zealand, and proposed actions for United Fresh to take. IFPS Sustainability Symposium: Following the 2021 UN Global Food Systems Summit, IFPS had identified the need of a fresh produce driven perspective on sustainability in food supply chains (IFPS, 2023). IFPS therefore sought to hold an international symposium, to <i>"reach a common understanding of what sustainability actually means within the global fresh produce industry, and where our emphasis as an industry, going forward, should be placed."</i> (IFPS, 2023). The symposium was held virtually, in November 2022. as noted by IFPS, <i>"Over 250 participants from 22 countries in North America, the European Union, Africa, Asia, South America and Oceania provided their input"</i> (IFPS, 2022).

	For the symposium, IFPS delegated responsibility for managing the Symposium to an internal working group, to which United Fresh provided several staff, including myself (personal communications, see for example emails 20 September 2022). This working group managed selection of invitees, development of all materials for the symposium, symposium scheduling, and online conference platform selection and management, prior to the symposium. During the symposium, the working group managed breakout sessions, minute taking, technical support of invitees, and assisting the speakers during presentations. At the conclusion of the symposium, the working group collated feedback for analysis, followed by writing a report of the symposium (IFPS, 2022) for presentation to the IFPS Executive Committee. My role for this symposium was to assist in delivery of outputs, including managing the New Zealand invitation process, assisting other working group members in enabling symposium delivery, collation of feedback during breakout sessions, and assisting in the writing & editing of the final Symposium Report for presentation to the IFPS Executive Committee.
Relationship to Targets 9.1, 9.4, and 12.2	9.1: The first objective of IFPS is <i>“In conjunction with stakeholders in the industry[,] to improve the supply chain efficiency of the fresh produce industry through developing, implementing and managing harmonised international standards”</i> (IFPS, n.d.). IFPS also notes on its sustainability page that <i>“Through sharing of knowledge and providing insights and inspiration, the IFPS will increase knowledge and understanding of our commitment to the UN Sustainability goals including the development, focus and efforts in sustainability in different countries”</i> (IFPS, n.d.-b.). United Fresh’s work in partnership with IFPS and other IFPS members, has been, as discussed above, about creating a standardised infrastructure through which efficiencies and sustainability can be achieved for the industry. United Fresh’ position is that this work therefore clearly meets the requirements of SDG 9.1, and in particular, the <i>“regional and trans-border infrastructure”</i> and <i>“quality, reliable, sustainable and resilient”</i> aspects (United Nations, 2015). 9.4: United Fresh’s position is <i>“increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes”</i> (United Nations, 2015) requires, as a first step, information be available for use (personal communications, see for example February 2023). IFPS’ second and third objectives are <i>“To act as a forum for comment and discussion on issues relating to international standards as they affect the produce industry”</i>, and <i>“To make recommendations and advocate appropriate courses of action in relation to international standards that affect the produce industry”</i> (IFPS, n.d.-a.). It is United Fresh’s view that the work of IFPS in enabling global dissemination of industry relevant information meets SDG 9.4 (personal communications, see for example February 2023). Information sharing between the IFPS member countries should enable the latest learnings within each country to be shared and distributed rapidly. This information sharing, paired with relevant and considered standards, would allow the global industry to meet the sustainability targets of the SDGs more effectively (personal communications, see for example February 2023). 12.2: United Fresh takes the position that the <i>“sustainable management and efficient use of natural resources”</i> of Target 12.2 (United Nations, 2015) is in alignment with

	the objectives of IFPS (personal communications, see as example email 25 October 2023). In particular, this position is informed by the objectives of IFPS, which include <i>“to improve the supply chain efficiency of the fresh produce industry...”</i> (IFPS, n.d.-a.). As this objective of IFPS relates to enabling efficiency in the fresh produce supply chain, which requires the management of resources used, United Fresh is of the view that this therefore aligns with Target 12.2 (personal communications, see as examples February 2023).
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Submissions to Government

Rationale, per United Fresh (Confidential Internal Reports, see as example United Fresh Technical Advisory Group Annual Report, February 2023), 2023)	<i>"From time to time, various government departments may request information or submissions on areas of legislation and regulation that affect United Fresh members. These requests may cover one or more of the areas that TAG has expertise in.</i> <i>When a request is made, TAG responds in the format requested by the government, and provides the government department requesting the information with the industry's views of the impacts and consequences of the legislation or regulation being considered. This hopefully contributes to informed decision making, on legislation and regulations that may affect the produce industry directly or indirectly."</i>
SDG relationship	United Fresh believes that its work in this category most closely matches with the three listed SDGs due to the following factors (personal communications, see as examples February 2023): - SDG 9: The work of United Fresh in making formal submissions to the Government, whether to Parliament Select Committees, Government ministries, or other agencies, has often included in the opening comments the following statement: <i>"United Fresh also welcomes the opportunity to comment on the proposed changes by way of this submission, as it provides us, as the pan-produce industry body, with the opportunity to enhance our membership's understanding of the issues"</i> (Lawes, Baptist, and Maurer, 2023). The submissions also often have a closing statement that is similar to: <i>"Any new regulations or tools... that do not take into account the realities of maintaining our position of maintaining food security within New Zealand, and within our trading partners, could result in unintended consequences"</i> (Lawes, Baptist, and Maurer, 2023). United Fresh submissions therefore explicitly serve a two-fold purpose: firstly, to enable industry to understand a topic, and how proposals may affect their activities, and secondly, to outline to Government the realities of the industry, to ensure any changes are fit-for-purpose, as: <i>"it is in the interest of the industry to ensure that it understands the appropriate technical details of proposed changes to systems that may impact how the industry may have to operate in the future, and to present our thoughts on how the changes being considered could be shaped to be effective, efficient, and not have unintended consequences that may limit its applicability"</i>. (Lawes, Baptist, and Maurer, 2023). These submissions can therefore be considered a crucial part of SDG 9's <i>"build resilient infrastructure"</i> (United Nations, 2015), in two ways. Firstly, it enables Government to build a sustainable legislative and regulatory framework. And, secondly, it allows for industry to understand an issue, in order to identify how to develop more resilient infrastructure for the future. - SDG 12: The <i>"ensuring sustainable consumption and production patterns"</i> of SDG 12 (United Nations, 2015), is known to be critically important for food supply chains in meeting the SDGs (Jacob-John et al., 2021; Bengtsson et al., 2018).

	SDG 12 is also considered to be linked into the relevant legislation and regulations affecting industry, which can alter how industry implements sustainability efforts (Ladan, 2018; Garske et al., 2020). In addition to the scientific literature linking SDG 12 and legislation, the New Zealand Office of the Auditor General found that the Government had no <i>“evidence of the Government giving directives or guidance to agencies to integrate the SDGs, incorporate them into strategic planning, or assess existing or proposed policy against the 2030 Agenda and relevant SDG targets”</i> (Office of the Auditor General, 2021). As such, it is United Fresh’s position that ensuring legislation reflects the realities of New Zealand industry will help advance SDG 12 (personal communications, see as examples February 2023). • SDG 13: <i>“Taking urgent action to combat climate change and its impacts”</i> (United Nations, 2015) is most definitely a part of the United Fresh Submissions activities. United Fresh has made multiple submissions on climate change related topics (Lawes & Maurer, 2018; Lawes & Arts, 2020; Lawes, 2022; Lawes, Baptist, and Maurer, 2023). In the most recent climate change related submission (Lawes, Baptist, and Maurer, 2023), United Fresh made the following statement: <i>“Our industry acknowledges that the production and supply chain of our fruits and vegetables creates greenhouse gas emissions. We understand that a paradigm shift will be required from our industry, in order to most effectively implement the required changes to reduce our emissions.”</i> SDG 13 is therefore clearly aligned with the United Fresh Submission activities.
Selected Activities	My work with TAG has involved the following significant activities within the Submissions To Government space related to the SDGs within the last 5 years, where this work has not already been covered under previous Sections: • Retail Grocery Market Study Engagement with Government: in November 2020, the Minister of Commerce and Consumer Affairs directed the New Zealand Commerce Commission (ComCom) <i>“to carry out a market study into the retail grocery sector (retail grocery study) under Part 3A of the Commerce Act 1986 (Act)”</i> (Commerce Commission, 2020). This study was <i>“to help inform the public, industry and Government about competition in the retail grocery sector and about how the sector operates.”</i> This study took approximately 16 months, with the Final Report released in March 2022 (Commerce Commission, 2022). The study involved multiple written submissions, a three-day online conference to discuss the draft findings, and individual organisation engagement with ComCom on specific questions and matters. United Fresh was a participant throughout the study, and engaged multiple times with ComCom on aspects of the study related to ensuring the fresh produce supply chain, and its challenges, were well understood (Maurer & Lawes, 2021-a; Maurer & Lawes, 2021-b.; Maurer, 2021). Following the release of the Final Report by the Commerce Commission, the New Zealand Government began implementing several of the recommendations into legislation and regulation, resulting in the Grocery Industry Competition Act (2023). During this process, United Fresh engaged with the Ministry for Business, Innovation, and Employment (MBIE) on how suitable regulations could be implemented in the

	fresh produce industry without impacting our sustainability as an industry (Lawes & Maurer, 2022-a.; Lawes & Maurer, 2022-b, Lawes & Maurer, 2023-b; Lawes & Maurer, 2023-c). United Fresh also made a submission to the Parliamentary Select Committee on the final legislation (Lawes & Maurer, 2022-c.). My role in this process was the management and coordination of research, analysis, and acting as primary or secondary author when responding to all government agencies regarding the impacts all proposed changes would have on the sustainability and viability of the fresh produce industry, as well as providing regular summaries and technical analysis updates to United Fresh on the engagement topics and the final outcomes, in a manner which industry could understand (Member Update Emails, see as example email 11 October 2023). • “Food & Beverage Industry Transformation Plan” Submission: in December 2022, The Ministry for Primary Industries (MPI) released the “Food and Beverage Draft Industry Transformation Plan” (MPI, 2022). This was intended to <i>“set a long-term vision for a sector and propose an action plan over the next three years to accelerate growth and transformation... [and] to drive a high-productivity, high-wage, and low-emissions future for Aotearoa.”</i> Having considered that the proposal did not adequately reflect the true needs of sustainability for the fresh produce sector, United Fresh made a submission to MPI (Maurer & Lawes, 2023-b) outlining the pathway we believed New Zealand would need to take in order to become more sustainable, including aspects related to the Treaty of Waitangi and increasing Māori representation in the agricultural economy. My role in this activity was to manage & coordinate the drafting of the document, acting as primary author, writing sections relevant to my areas of technical competency, and managing the review & submission process. • NZ Emissions Trading Scheme Submission: in 2023, the Ministry for the Environment (MfE) released the <i>“Te Arotake Mahere Hokohoko Tukunga Review of the New Zealand Emissions Trading Scheme Discussion document”</i> (MfE, 2023), aimed at reviewing the Emissions Trading Scheme (ETS), in order to <i>“clarify the impact that the NZ ETS will have under its current settings and identify the changes that may be needed”</i>. This was due to Government analysis suggesting <i>“that the current design of the NZ ETS does not align with the Government’s decision to prioritise emissions reductions in Aotearoa New Zealand’s climate response”</i>. United Fresh was of the view that <i>“a well-designed revised NZ ETS will be much more effective, efficient, and enduring than the current system”</i> (Lawes, Baptist, and Maurer, 2023), and that <i>“the NZ ETS review will help New Zealand towards achieving the United Nations Sustainable Development Goals”</i>. Given this viewpoint, United Fresh responded to the consultation, to discuss our viewpoint of how the new ETS could be more effectively designed to assist in decarbonising New Zealand in general, and the fresh produce industry in specific (Lawes, Baptist, and Maurer, 2023). My role in this work was to manage the research, analysis, and preparation of the submission to MfE, acting as primary author and reviewer, coordination of other TAG members in the writing and review stages, and managing submission to MfE.
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Relationship to Targets 9.1, 9.4, and 12.2	9.1: while not directly creating infrastructure in the United Fresh Submission activities, as noted in the TAG Annual Activity Reports (Confidential Internal Report, see as examples United Fresh Technical Advisory Group Annual Report, February 2023), submissions enable the government to understand <i>“the industry’s views of the impacts and consequences of the legislation or regulation being considered. This hopefully contributes to informed decision making, on legislation and regulations that may affect the produce industry directly or indirectly.”</i> Looking at implementing the targets of SDG 9, the UN ESCAP in 2023 noted: <i>“policies should promote a green, inclusive and resilient recovery... [a] transition towards higher-productivity, innovation-focused industries that could provide enhanced growth opportunities and higher economic resilience.”</i> (ESCAP, 2023). The development of SDG Target 9.1’s <i>“resilient infrastructure”</i> (United Nations, 2015) can therefore be considered to be advanced by United Fresh’s Submissions activities. 9.4: Being able to <i>“upgrade infrastructure and retrofit industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes”</i> (United Nations) requires a legislative framework that supports the SDGs. For Ladan (2015), <i>“the law is both an enabler and facilitator of development that is both inclusive and integrative of all the three dimensions of sustainable development”</i>. Given that the law and related policies are also noted as challenges to implementing sustainable food systems and industry (Galli et al., 2020), working towards ensuring legislation reflects the realities of how an industry can achieve sustainability should be considered a core part of United Fresh’s work towards Target 9.4. 12.2: given Ladan (2018) and Garske et al. (2020)’s discussions of the need to consider and implement appropriate legalisation in order for industry to achieve sustainability. The impact of legislation on how the produce industry could achieve sustainability with regards to <i>“sustainable management and efficient use of natural resources”</i> are also discussed in United Fresh submissions, such as when discussing the use of plastic labels (Maurer, Arts, and Lawes, 2020). United Fresh is therefore aware of the link between resource usage and the legislative impacts that may hamper or assist industry’s ability to improve resource efficiency, and considers 12.2 to be a part of its Submission activities.
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Communications

Rationale, per United Fresh Internal Reports, see as example United Fresh Technical Advisory Group Annual Report, February 2023), (Confidential 2023)	No direct rationale is given for this in the internal TAG Annual Activity Reports (Confidential Internal Report, see as examples United Fresh Technical Advisory Group Annual Report, February 2023), due to it relating to communications to industry, or the Executive Committee, on work completed within the other topics, and is, for the purposes of governance, not considered a topic of work in and of itself. TAG's rationale for this being a separate topic in TAGs internal management framework relates to the work being performed here, despite relating to activities within the other categories, being performed for the primary purpose of informing the Executive Committee & industry about active or completed work that affects the industry, either by United Fresh, or external parties. Therefore, TAG in its management of this topic treats Industry Communications as its own topic.
SDG relationship	United Fresh believes that its work in this category most closely matches with the three listed SDGs due to the following factors (personal communications, see as examples February 2023): - SDG 2: SDG 2 is <i>"End hunger, achieve food security and improved nutrition and promote sustainable agriculture"</i> (United Nations, 2015). United Fresh's newsletter-based member communications include information on topics such as food safety and food waste (mem). These allow the industry to better understand the science, and to implement policies that ensure improved nutrition and sustainable agricultural practices. These communications also include fact sheets during natural disasters, food safety incidents, and biosecurity events, to ensure industry can react swiftly to implement processes that reduce food loss and food waste, to ensure ongoing production and consistent food security. - SDG 9: in addition to the goals around resilient infrastructure, SDG 9 includes <i>"promote inclusive and sustainable industrialization"</i> (United Nations, 2015). As noted in the Rationale, this is not a direct topic in and of itself, so communications may not be directly related to inclusive and sustainable development. However, these relate to other United Fresh activities that are conducted for the purposes of sustainable industrialisation. The communications to industry therefore form the promotional aspect of United Fresh's work, promoting to industry the latest in sustainability practices. This enables industry to act in a more considered manner, and to implement appropriate sustainability methods. - SDG 12: SDG 12 is <i>"Ensure sustainable consumption and production patterns"</i> (United Nations, 2015). While not all SDG 12 Targets are necessarily relevant to the communications work, SDG Target 12.6, 12.7, and 12.8 all refer to the dissemination of information related to sustainable practices. For the United Fresh Communications activities, these can therefore be considered to align rather strongly with SDG Targets 12.6, 12.7, and 12.8.
Selected Activities	This is not an independent topic, but rather related to the work performed for activities under prior topics listed previously. Significant activities within these other topics resulted in United Fresh needing to communicate outcomes and progress of these activities to members. These communications were often discrete outputs that did not affect the overall delivery of the core activity, but were intended to communicate with industry a summary of an activity

	and the reasoning for TAG undertaking this activity, or summarising other activities occurring within the fresh produce industry that the industry should be aware of., Given this, the activities here are not topic specific, but rather type specific. My work with TAG involved the following activities within the Industry communications space related to the SDGs within the last 5 years: TAG Annual Activity Reports: as part of its reporting requirements to the Executive Committee, TAG provides an internal Annual Activity Report each year to the Executive Committee. This report outlines all work undertaken within each topic that TAG is responsible for, an analysis the work & the circumstances that led to the work being necessary, and an indicative work plan for the following year, indicating the activities that TAG expects to be necessary in meeting its mandate (Confidential Internal Report, see as examples United Fresh Technical Advisory Group Annual Report, February 2023). As of 2023, this has now also expanded to include a half-yearly report, which is similar to the full Annual Activity Report, lacking only the indicative work plan for the following year. My role in this area is to manage & coordinate the writing of the report, ensuring that all activities have been appropriately included and analysed. I also ensure that the indicative plan for the following year has considered all likely topics & activities that can be reasonably expected to arise. Industry Newsletters: Recognising the need for consistent communications with industry on topics that may arise, TAG provides regular short summary reports on relevant technical topics of interest to the industry to United Fresh, who then publish these as emailed informational newsletters. These have a schedule of monthly for general topics, but there is also the ability to send out additional newsletters as and when required, in the event of urgent communications to industry being required. My work in this role has been to coordinate and manage the writing of the summaries for these newsletters by the relevant TAG technical experts. Following the initial draft of these newsletters, my role has then been to manage the editing and review process, to ensure these are succinct and understandable to industry, before coordinating the publishing of the newsletters to industry. Executive updates: depending on the individual activities within each topic area that TAG covers, TAG informs the Executive of activity progress, for the Executive Committee to consider. These updates are written for a variety of reasons, including to propose TAG begin new activity, updating on ongoing activities of significant length, reporting on completed activities, or to inform the Executive of activities undertaken by external parties that may affect United Fresh (Confidential Internal Report, see as examples Methyl Bromide Update, 28 November 2019). My role within this topic has been to author all relevant updates for the topics where I am the technical expert for TAG. Where I am not the technical expert, my role involves coordinating & managing the writing of updates, followed by managing their publication to either the Executive Committee, or industry, as appropriate.
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	Over the last 5 years, this has resulted in my authoring of updates related to multiple activities within every single topic for which I am the technical expert, including several which resulted in additional activities commencing within the sustainability and SDG area. - Webinars and presentation: on occasion, United Fresh has determined written communication with industry on certain TAG topics to not be sufficient in improving industry sustainability. In these cases, United Fresh has arranged online webinars and in-person presentations, to inform industry of the relevant TAG activity. These presentations are led by the relevant TAG technical experts. My role in these has been to manage & coordinate the creation of presentation materials for all presentations, including those on which I will be the technical expert. I was also responsible for coordinating the TAG technical experts to be prepared for presenting on their topics, as well as presenting on my topics. - In-person engagement: In addition to the written and video presentations to industry, TAG also engages with industry at in-person at conferences and relevant meetings. These engagements can be a part of a wider conference or meeting, such as running a booth at industry conferences, or during United Fresh member meetings. Alternatively, at United Fresh or TAG's determination, specific meetings with industry may be established, to discuss specific activities of relevance to industry. My role at these in-person engagements has been to inform industry of the relevant work both TAG & I have undertaken, and the relevant future activities. This has included in-depth technical research and discussions with members, providing relevant documentation that TAG has published on the activity, and coordinating further engagements as required, to ensure industry is fully aware of all sustainability topics.
Relationship to Targets 9.1, 9.4, and 12.2	9.1: the Communications activity for United Fresh has aligned with Target 9.1 in at least two separate ways. Firstly, as noted by Adshead et al. in 2015, a failure in developing long term-strategies or developing industry progress towards sustainability over a long period significantly reduces the ability to meet the SDGs. Given this, it was noted as important that decision makers had the information necessary to make accurate analyses and to implement effective actions. Secondly, as noted by Mulholland (2019), the United Nations identified communications on sustainability and the SDGs. Mulholland went so far as to state "Communication and awareness raising for the SDGs is embedded in effective implementation." Given these , it is United Fresh's position that communications to industry enable industry to meet SDG Target 9.1, as the information necessary for informed decision making on infrastructure is available. Absent this communication, industry may not have access to the information needed to implement Target 9.1. 9.4: SDG Target 9.4 includes in its wording "<i>greater adoption of clean and environmentally sound technologies and industrial processes</i>" (United Nations, 2015). Yet, as noted by PWC (2015), much of the SDG work surrounding the SDGs is not focused on the private sector. PWC warned that "real direction is needed, written in a way that's tailored to resonate with the business community and inspire action", in

	order to assist businesses with meeting the SDGs. The position of PWC is supported by Oosterhof (2018), who argues more broadly that “effective localization requires, first and foremost, awareness of the SDGs.” Given this, United Fresh has taken the position that, in order for industry to be able to localise and implement actions that progress the SDGs, industry first needs to be aware of other actions occurring around the industry related to the SDGs. In this way, industry can become aware of the sustainable technology and processes available. United Fresh’s communications are therefore intended to raise awareness of the technologies and processes required to meet SDG 9.4. • 12.2: It is the position of United Fresh (Internal Emails, see as examples, 19 January 2023) that Target 12.2 is linked with Targets 12.6, <i>“Encourage companies, especially large and transnational companies, to adopt sustainable practices and to integrate sustainability information into their reporting cycle”</i>, and 12.8, <i>“By 2030, ensure that people everywhere have the relevant information and awareness for sustainable development and lifestyles in harmony with nature”</i> (United Nations, 2015). A lack of knowledge about sustainability and how to implement it is acknowledged as a barrier to implementation within supply chains, and for small businesses (Rodriguez et al., 2009; Marques, 2019; Ghadge et al., 2021; Afolabi et al., 2023). Collaborative approaches to sustainability have also been shown to help improve sustainability implementations, if managed correctly (Touboullic & Walker, 2015; Vazquez-Brust et al, 2020). It is also acknowledged that food loss and food waste in fresh produce industry can be mitigated through improved communications (Magalhães, Ferreira, and Silva, 2022). Information sharing is therefore a significant step towards implementing sustainability in the supply chains, through the spread of information and enabling of collaboration and is known to be a pathway towards reducing waste in food supply chains, which leads to efficiency gains (Usubiaga, Butnar, & Schepelmann, 2018). Communicating sustainability knowledge to industry is therefore a critical method by which Target 12.2 can be achieved within the New Zealand fresh produce industry.
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Bibliography

- Adshead, D., Thacker, S., Fuldauer, L. I., & Hall, J. W. (2019). Delivering On The Sustainable Development Goals Through Long-Term Infrastructure Planning. *Global Environmental Change*, 59, 101975.
- Afolabi, H., Ram, R., Hussainey, K., Nandy, M., & Lodh, S. (2023). Exploration Of Small And Medium Entities' Actions On Sustainability Practices And Their Implications For A Greener Economy. *Journal Of Applied Accounting Research*, 24(4), 655-681.
- Afshin, A., Micha, R., Khatibzadeh, S., Schmidt, L. A., & Mozaffarian, D. (2014). Dietary Policies To Reduce Non-Communicable Diseases. *The Handbook Of Global Health Policy*, 175-193.
- Akhtar, S., Sarker, M. R., & Hossain, A. (2014). Microbiological Food Safety: A Dilemma Of Developing Societies. *Critical Reviews In Microbiology*, 40(4), 348-35.
- Alfaro, J. A., & Rábade, L. A. (2009). Traceability As A Strategic Tool To Improve Inventory Management: A Case Study In The Food Industry. *International Journal Of Production Economics*, 118(1), 104-110.
- Allen, C., Metternicht, G. & Wiedmann, T. (2018). Initial Progress In Implementing The Sustainable Development Goals (SDGs): A Review Of Evidence From Countries. *Sustain Sci* 13, 1453–1467.
- Allen, C., Metternicht, G. & Wiedmann, T. Prioritising SDG Targets: Assessing Baselines, Gaps, And Interlinkages. *Sustain Sci* 14, 421–438 (2019).
- Allen, H., Cury, A., Gaston, T., Graf, C., Wakley, H., & Willis, M. (2019). What Does Better Peer Review Look Like? Underlying Principles And Recommendations For Better Practice. *Learned Publishing*, 32(2), 163-175.
- Anastasiadis, F., Manikas, I., Apostolidou, I., & Wahbeh, S. (2022). The Role Of Traceability In End-To-End Circular Agri-Food Supply Chains. *Industrial Marketing Management*, 104, 196-211.
- Aruoma, O. I. (2006). The Impact Of Food Regulation On The Food Supply Chain. *Toxicology*, 221(1), 119-127.
- Banks, J., & Bristow, G. (1999). Developing Quality In Agro-Food Supply Chains: A Welsh Perspective. *International Planning Studies*, 4(3), 317-331.
- Bengtsson, M., Alfredsson, E., Cohen, M., Lorek, S., & Schroeder, P. (2018). Transforming Systems Of Consumption And Production For Achieving The Sustainable Development Goals: Moving Beyond Efficiency. *Sustainability Science*, 13, 1533-1547.
- Beulens, A. J., Broens, D. F., Folstar, P., & Hofstede, G. J. (2005). Food Safety And Transparency In Food Chains And Networks Relationships And Challenges. *Food Control*, 16(6), 481-486.
- Beyne, J. (2020). Designing And Implementing Sustainability: An Integrative Framework For Implementing The Sustainable Development Goals. *European Journal Of Sustainable Development*, 9(3), 1-1.
- Caro, M. P., Ali, M. S., Vecchio, M., & Giaffreda, R. (2018, May). Blockchain-Based Traceability In Agri-Food Supply Chain Management: A Practical Implementation. In *2018 IOT Vertical And Topical Summit On Agriculture-Tuscany (IOT Tuscany)* (Pp. 1-4). IEEE.
- Cerutti, A. K., Beccaro, G. L., Bruun, S., Bosco, S., Donno, D., Notarnicola, B., & Bounous, G. (2014). Life Cycle Assessment Application In The Fruit Sector: State Of The Art And Recommendations For Environmental Declarations Of Fruit Products. *Journal Of Cleaner Production*, 73, 125-135.
- Cerutti, A. K., Bruun, S., Beccaro, G. L., & Bounous, G. (2011). A Review Of Studies Applying Environmental Impact Assessment Methods On Fruit Production Systems. *Journal Of Environmental Management*, 92(10), 2277-2286.
- Commerce Commission New Zealand, 2020. *Market Study Into The Retail Grocery Sector – Statement Of Process*.
- Commerce Commission New Zealand, 2020. *Market Study Into The Retail Grocery Sector – Final Report*.
- Cook, D. C., Fraser, R. W., Paini, D. R., Warden, A. C., Lonsdale, W. M., & De Barro, P. J. (2011). Biosecurity And Yield Improvement Technologies Are Strategic Complements In The Fight Against Food Insecurity. *Plos One*, 6(10), E26084.
- Dados, N., & Connell, R. (2012). The Global South. *Contexts*, 11(1), 12-13.

- De Boni, A., Ottomano Palmisano, G., De Angelis, M., & Minervini, F. (2022). Challenges For A Sustainable Food Supply Chain: A Review On Food Losses And Waste. *Sustainability*, 14(24), 16764. <https://doi.org/10.3390/Su142416764>
- Dunning, R., Bloom, J. D., & Creamer, N. (2015). The Local Food Movement, Public-Private Partnerships, And Food System Resiliency. *Journal Of Environmental Studies And Sciences*, 5, 661-670.
- Elder, M. & Olsen, S. (2019) "The Design Of Environmental Priorities In The SDGs" *Global Policy* (10:1) Pp.70-82.
- ESCAP, U. (2023). *SDG 9: Industry, Innovation, And Infrastructure*.
- Galli, F., Prosperi, P., Favilli, E., D'Amico, S., Bartolini, F., & Brunori, G. (2020). How Can Policy Processes Remove Barriers To Sustainable Food Systems In Europe? Contributing To A Policy Framework For Agri-Food Transitions. *Food Policy*, 96, 101871.
- Garske, B., Heyl, K., Ekdardt, F., Weber, L. M., & Gradzka, W. (2020). Challenges Of Food Waste Governance: An Assessment Of European Legislation On Food Waste And Recommendations For Improvement By Economic Instruments. *Land*, 9(7), 231.
- Gennari, P., & D'Orazio, M. (2020). A Statistical Approach For Assessing Progress Towards The SDG Targets. *Statistical Journal Of The IAOS*, 36(4), 1129-1142.
- Ghadge, A., Er Kara, M., Mogale, D. G., Choudhary, S., & Dani, S. (2021). Sustainability Implementation Challenges In Food Supply Chains: A Case Of UK Artisan Cheese Producers. *Production Planning & Control*, 32(14), 1191-1206.
- Gibbs, G. (1988). *Learning By Doing: A Guide To Teaching And Learning Methods*. London: Further Education Unit.
- Global Goals, n.d. <https://www.globalgoals.org/goals/17-partnerships-for-the-goals/> Accessed 10 October 2023.
- Grocery Industry Competition Act, No. 31. (2023). <https://www.legislation.govt.nz/act/public/2023/0031/latest/LMS743553.html>. Accessed 05 October 2023.
- Havas, K., & Salman, M. (2011). Food Security: Its Components And Challenges. *International Journal Of Food Safety, Nutrition, And Public Health*, 4(1), 4-11.
- Henderson, K., & Loreau, M. (2023). A Model Of Sustainable Development Goals: Challenges And Opportunities In Promoting Human Well-Being And Environmental Sustainability. *Ecological Modelling*, 475, 110164.
- Henson, S. (2003). *The Economics Of Food Safety In Developing Countries*.
- Herrera, V. (2019). Reconciling Global Aspirations And Local Realities: Challenges Facing The Sustainable Development Goals For Water And Sanitation. *World Development*, 118, 106-117.
- Hodges, R. J., Buzby, J. C., & Bennett, B. (2011). Postharvest Losses And Waste In Developed And Less Developed Countries: Opportunities To Improve Resource Use. *The Journal Of Agricultural Science*, 149(S1), 37-45.
- Huan, Y., Wang, L., Burgman, M., Li, H., Yu, Y., Zhang, J., & Liang, T. (2022). A Multi-Perspective Composite Assessment Framework For Prioritizing Targets Of Sustainable Development Goals. *Sustainable Development*, 30(5), 833-847.
- Husebø, S. E., O'Regan, S., & Nestel, D. (2015). Reflective Practice And Its Role In Simulation. *Clinical Simulation In Nursing*, 11(8), 368-375.
- IFPS, 2022. *IFPS Sustainability Symposium Summary*. https://www.ifpsglobal.com/portals/22/IFPS%20Symposium%20summary_Final.Pdf. Accessed 10 October 2023.
- IFPS, n.d.-a. <https://www.ifpsglobal.com/>. Accessed 12 October 2023
- IFPS, n.d.-b. <https://www.ifpsglobal.com/IFPS-Focus-Areas/Sustainability>. Accessed 20 October 2023.
- Ilie, C. M., Brovelli, M. A., & Coetzee, S. (2019). Monitoring SDG 9 With Global Open Data And Open Software—A Case Study From Rural Tanzania. *The International Archives Of The Photogrammetry, Remote Sensing And Spatial Information Sciences*, 42, 1551-1558.

- Inacio, T, Arts, A.M., And Maurer, H., 2022. *Research And Knowledge Compilation Related To Returnable Plastic Crates And The Management Of Tomato Brown Rugose Fruit Virus And Pepino Mosaic Virus*. Incorporated Societies Act 2022, No 12.
<https://www.legislation.Govt.Nz/Act/Public/2022/0012/Latest/Whole.Html#LMS100892>
- Institute Of Directors In New Zealand Inc., 2014. *The Four Pillars Of Governance Best Practice For New Zealand Directors*. Wellington, New Zealand.
- IRHACE, n.d. <https://www.irhace.org.nz/> Accessed 12 October 2023.
- Islam, S., Manning, L., & Cullen, J. M. (2021). A Hybrid Traceability Technology Selection Approach For Sustainable Food Supply Chains. *Sustainability*, 13(16), 9385.
- Jacob-John, J., D'Souza, C., Marjoribanks, T., & Singaraju, S. (2021). Synergistic Interactions Of SDGs In Food Supply Chains: A Review Of Responsible Consumption And Production. *Sustainability*, 13(16), 8809.
- Jagtap, S., & Rahimifard, S. (2019). Unlocking The Potential Of The Internet Of Things To Improve Resource Efficiency In Food Supply Chains. In *Innovative Approaches And Applications For Sustainable Rural Development: 8th International Conference, HAICTA 2017, Chania, Crete, Greece, September 21-24, 2017, Selected Papers 8* (Pp. 287-301). Springer International Publishing.
- Janoušková, S., Hák, T., & Moldan, B. (2018). Global SDGs Assessments: Helping Or Confusing Indicators? *Sustainability*, 10(5), 1540.
- Jia, Z., Wu, M., Niu, Z., Tang, B., & Mu, Y. (2020). Monitoring Of UN Sustainable Development Goal SDG-9.1. 1: Study Of Algerian "Belt And Road" Expressways Constructed By China. *Peerj*, 8, E8953
- Kanie, N., & Biermann, F. (Eds.). (2017). *Governing Through Goals: Sustainable Development Goals As Governance Innovation*. MIT Press.
- Knowles, Z., Tyler, G., Gilbourne, D., & Eubank, M. (2006). Reflecting On Reflection: Exploring The Practice Of Sports Coaching Graduates. *Reflective Practice*, 7(2), 163-179.
- Kynčlová, P., Upadhyaya, S., & Nice, T. (2020). Composite Index As A Measure On Achieving Sustainable Development Goal 9 (SDG-9) Industry-Related Targets: The SDG-9 Index. *Applied Energy*, 265, 114755.
- Ladan, M. T. (2018). Achieving Sustainable Development Goals Through Effective Domestic Laws And Policies On Environment And Climate Change. *Envtl. Pol'y & L.*, 48, 42.
- Ladan, M. T. (2018). Achieving Sustainable Development Goals Through Effective Domestic Laws And Policies On Environment And Climate Change. *Environmental Policy And Law*, 48(1), 42-63. Doi:10.3233/Epl-180049
- Lafortune, G., & Schmidt-Traub, G. (2019). *SDG Challenges In G20 Countries. Sustainable Development Goals: Harnessing Business To Achieve The SDGs Through Finance, Technology, And Law Reform*, 219-234.
- Latouche, K., Rainelli, P., & Vermersch, D. (1998). Food Safety Issues And The BSE Scare: Some Lessons From The French Case. *Food Policy*, 23(5), 347-356.
- Lawes, 2022. *Response To MFE Consultation Document: Proposed Measures To Reduce The Environmental Impact Of Fluorinated Gases*.
- Lawes, J. & Maurer, H., 2022-a. *Response To MBIE Consultation Paper New Zealand Grocery Code Of Conduct*. Submission To Ministry For Business, Innovation, And Employment.
- Lawes, J. & Maurer, H., 2022-b. *Response To MBIE Discussion Paper Mandatory Unit Pricing For Grocery Products*. Submission To Ministry For Business, Innovation, And Employment.
- Lawes, J. & Maurer, H., 2022-c. *Response To Grocery Industry Competition Bill*. Submission To Parliamentary Select Committee On Economic Development, Science, And Innovation
- Lawes, J. & Maurer, H., 2023-b. *Response To Draft Consumer Information Standards (Unit Pricing For Grocery Products) Regulations 2023 Consultation Paper*. Submission To Ministry For Business, Innovation, And Employment.
- Lawes, J. & Maurer, H., 2023-c. *Response To MBIE Consultation Paper Exposure Draft – New Zealand Grocery Supply Code Of Conduct*. Submission To Ministry For Business, Innovation, And Employment.
- Lawes, J., & Arts, A.M., 2019-a. *Implications Of The 2020 Methyl Bromide Fumigation Controls On New Zealand Produce Imports*. Submission To The New Zealand Environmental Protection Authority.

- Lawes, J., & Arts, A.M., 2019-b. *Implications Of The 2020 Methyl Bromide Fumigation Regulations On New Zealand Produce Imports*.
- Lawes, J., & Arts, A.M., 2020. *Implications Of The Proposed Licensing Regime For Refrigeration, Heating & Air Conditioning Technicians*. Submission To The Ministry For Business, Innovation, And Employment.
- Lawes, J., & Maurer, H., 2018. *Ensuring Effective Regulation Of Health & Safety Risks Associated With Toxic Or Flammable Gases*. Submission To The Ministry For Business, Innovation, And Employment.
- Lawes, J., & Maurer, H., 2021. *Response To MPI Risk Management Proposal: Irradiation As A Phytosanitary Measure For The Management Of Tephritid Fruit Flies*. Submission To The Ministry For Primary Industries.
- Lawes, J., Baptist, S., And Maurer, H., 2023. *United Fresh Response To MfE On Discussion Document: Review Of The New Zealand Emissions Trading Scheme*. Submission To The Ministry For The Environment.
- Le Blanc D. (2015). Towards Integration At Last? The Sustainable Development Goals As A Network Of Targets. *Sustainable Dev* 2015;23:176–87.
- Lee, H., & Yoon, Y. (2021). Etiological Agents Implicated In Foodborne Illness Worldwide. *Food Science Of Animal Resources*, 41(1), 1.
- Lin, K., Chavalarias, D., Panahi, M., Yeh, T., Takimoto, K., & Mizoguchi, M. (2020). Mobile-Based Traceability System For Sustainable Food Supply Networks. *Nature Food*, 1(11), 673-679.
- Lucas, J. A. (2011). Advances In Plant Disease And Pest Management. *The Journal Of Agricultural Science*, 149(S1), 91-114.
- Magalhães, V. S., Ferreira, L. M. D., & Silva, C. (2022). Prioritising Food Loss And Waste Mitigation Strategies In The Fruit And Vegetable Supply Chain: A Multi-Criteria Approach. *Sustainable Production And Consumption*, 31, 569-581.
- Marques, L. (2019). Sustainable Supply Network Management: A Systematic Literature Review From A Knowledge Perspective. *International Journal Of Productivity And Performance Management*, 68(6), 1164-1190.
- Maurer, 2021. *Market Study Into The Retail Grocery Sector Letter*. Letter To The Commerce Commission.
- Maurer, H. & Lawes, J., 2021-A. *Response To Market Study Into The Retail Grocery Sector*. Submission To Commerce Commission New Zealand.
- Maurer, H. & Lawes, J., 2021-B. *United Fresh New Zealand Incorporated Comments In Response To Commerce Commission Draft Report Market Study Into The Retail Grocery Sector*. Submission To Commerce Commission New Zealand.
- Maurer, H. & Lawes, J., 2023-A. *Response To MPI Food And Beverage Industry Transformation Plan Consultation*. Submission To The Ministry For Primary Industries.
- Maurer, H. & Lawes, J., 2023-B. *Summary Of Response To MPI Food And Beverage Industry Transformation Plan Consultation*.
- Maurer, H., Arts, A.M., And Lawes, J., 2020. *Reducing The Impact Of Plastic On Our Environment*. Submission To Ministry For The Environment.
- Maurer, H., Lawes, J., And Inacio, T., 2023. *Towards Achieving The United Nations Sustainable Development Goals. Guidelines For The New Zealand Fresh Produce Value Chain*.
- McCallum, S., & Milner, M. M. (2021). The Effectiveness Of Formative Assessment: Student Views And Staff Reflections. *Assessment & Evaluation In Higher Education*, 46(1), 1-16.
- Ministry For Primary Industries, 2022. *Food And Beverage Draft Industry Transformation Plan*.
- Ministry For The Environment, 2020. *Reducing The Impact Of Plastic On Our Environment – Moving Away From Hard-To-Recycle And Single-Use Items*. Wellington: Ministry For The Environment.
- Ministry For The Environment, 2022. *Consultation On The Ministry For The Environment's Draft Long-Term Insights Briefing 2022*. Wellington: Ministry For The Environment.
- Ministry For The Environment, 2022. *Proposed Measures To Reduce The Environmental Impact Of Fluorinated Gases: Consultation Document*. Wellington: Ministry For The Environment.

- Ministry For The Environment, 2023. *Te Arotake Mahere Hokohoko Tukunga Review Of The New Zealand Emissions Trading Scheme Discussion Document*.
- Ministry of Foreign Affairs & Trade, 2019. *New Zealand's Progress Towards The SDGs – 2019*.
- Miola, A., & Schiltz, F. (2019). Measuring Sustainable Development Goals Performance: How To Monitor Policy Action In The 2030 Agenda Implementation? *Ecological Economics*, 164.
- Moe, T. (1998). Perspectives On Traceability In Food Manufacture. *Trends In Food Science & Technology*, 9(5), 211-214.
- Mol, A. P., & Oosterveer, P. (2015). Certification Of Markets, Markets Of Certificates: Tracing Sustainability In Global Agro-Food Value Chains. *Sustainability*, 7(9), 12258-12278.
- Mowat, A. D. (2014, August). Market Oriented Assessment Of The Environmental Impact Of The New Zealand Kiwifruit Value Chain. In XXIX International Horticultural Congress On Horticulture: Sustaining Lives, Livelihoods And Landscapes (IHC2014): 1112 (Pp. 439-446).
- MPI, n.d.-a. <https://www.mpi.govt.nz/biosecurity/exotic-pests-and-diseases-in-new-zealand/pests-and-diseases-under-response/queensland-fruit-fly/>. Accessed 04 October 2023.
- MPI, n.d.-b. <https://www.mpi.govt.nz/biosecurity/exotic-pests-and-diseases-in-new-zealand/pests-and-diseases-under-response/queensland-fruit-fly/eradication-of-queensland-fruit-fly/>. Accessed 04 October 2023.
- Mulholland, E. (2019). Communicating Sustainable Development And The Sdgs In Europe: Good Practice Examples From Policy, Academia, Ngos, And Media. *ESDN Quarterly Report*, 51, 1-22.
- Mycoplasma Bovis Governance Group, 2021. *Report Of The Independent Review Into The Mycoplasma Bovis Programme*.
- NZFSSRC, 2022. <https://www.nzfssrc.org.nz/resources/recycled-packaging-page/#/> Accessed 08 October 2023.
- Office Of The Auditor General, 2021. *The Government's Preparedness To Implement The Sustainable Development Goals*. Report For The New Zealand House Of Representatives.
- Opara, L. U., & Mazaud, F. (2001). Food Traceability From Field To Plate. *Outlook On Agriculture*, 30(4), 239-247.
- Peck, H. (2005). Drivers Of Supply Chain Vulnerability: An Integrated Framework. *International Journal Of Physical Distribution & Logistics Management*, 35(4), 210-232.
- Philippidis, G., Shutes, L., M'Barek, R., Ronzon, T., Tabeau, A., & Van Meijl, H. (2020). Snakes And Ladders: World Development Pathways' Synergies And Trade-Offs Through The Lens Of The Sustainable Development Goals. *Journal Of Cleaner Production*, 267, 122147.
- Pretty, J. (1999). Reducing The Costs Of Modern Agriculture: Towards Sustainable Food And Farming Systems. *Sustainable Agriculture And Environment: Globalisation And The Impact Of Trade Liberalisation.*, 79-100.
- Pretty, J. (2000). Towards Sustainable Food And Farming Systems In Industrialised Countries. *International Journal Of Agricultural Resources, Governance, And Ecology*, 1(1), 77-94.
- PWC, 2015. *Make It Your Business: Engaging With The Sustainable Development Goals*.
- Quinton, S., & Smallbone, T. (2010). Feeding Forward: Using Feedback To Promote Student Reflection And Learning—A Teaching Model. *Innovations In Education And Teaching International*, 47(1), 125-135.
- Ringsberg, H. A. (2015). Implementation Of Global Traceability Standards: Incentives And Opportunities. *British Food Journal*, 117(7), 1826-1842.
- Rodriguez, J. M., Molnar, J. J., Fazio, R. A., Sydnor, E., & Lowe, M. J. (2009). Barriers To Adoption Of Sustainable Agriculture Practices: Change Agent Perspectives. *Renewable Agriculture And Food Systems*, 24(1), 60-71.
- Schmidt-Traub, G., Kroll, C., Teksoz, K., Durand-Delacre, D., & Sachs, J. D. (2017). National Baselines For The Sustainable Development Goals Assessed In The SDG Index And Dashboards. *Nature Geoscience*, 10(8), 547-555.
- Shatz, D. (2004). *Peer Review: A Critical Inquiry*. Rowman & Littlefield.

- Shulla, K., & Leal-Filho, W. (2023). *Achieving The UN Agenda 2030: Overall Actions For The Successful Implementation Of The Sustainable Development Goals Before And After The 2030 Deadline*.
- Spier, R. (2002). The History Of The Peer-Review Process. *TRENDS In Biotechnology*, 20(8), 357-358.
- Stone, J., Rahimifard, S., & Woolley, E. (2015). An Overview Of Resilience Factors In Food Supply Chains.
- Stranieri, S., Cavaliere, A., & Banterle, A. (2016). Voluntary Traceability Standards And The Role Of Economic Incentives. *British Food Journal*, 118(5).
- Talma, M. (2019). *Global Governance And The Personal Sector: The Impact Of SDG 12 On Sustainable Reporting*.
- Thore, S., & Tarverdyan, R. (2021). *Measuring Sustainable Development Goals Performance*. Elsevier.
- Touboullic, A., & Walker, H. (2015). Love Me, Love Me Not: A Nuanced View On Collaboration In Sustainable Supply Chains. *Journal Of Purchasing And Supply Management*, 21(3), 178-191.
- Töyrylä, I. (1999). *Realising The Potential Of Traceability: A Case Study Research On Usage And Impacts Of Product Traceability*. Helsinki University Of Technology.
- Trummer, P., Ammerer, G., & Scherz, M. (2022). Sustainable Consumption And Production In The Extraction And Processing Of Raw Materials—Measures Sets For Achieving SDG Target 12.2. *Sustainability*, 14(17), 10971.
- Trust Alliance, n.d. <https://Trustalliance.Co.Nz/About/>. Accessed 04 October 2023.
- UNEP, n.d. <https://www.unep.org/Explore-Topics/Sustainable-Development-Goals/Why-Do-Sustainable-Development-Goals-Matter/Goal-17>. Accessed 10 October 2023
- United Fresh, 2003. United Fresh Constitution.
- United Fresh, 2020. The Future For Fruit & Vegetable Kai Systems In Aotearoa New Zealand. Official Dialogue Feedback To The United Nations 2021 Food Systems Summit.
- United Fresh, 2021. The Case For Traceability: Produce Industry Traceability Guidelines. Sustainable Farming Fund Project 405482, Effective Fresh Produce Traceability Systems.
- United Fresh, 2021-A. The Case For Traceability. Produce Industry Traceability Guidelines.
- United Fresh, 2022. Summary Of Recycled Packaging Food Safety Risks New Zealand Research.
- United Fresh, 2023. Fresh Facts. <https://unitedfresh.co.nz/Assets/Site/Images/Images/Fresh-Facts-%E2%80%93-Online-Version-2023.Pdf>. Accessed 24 October 2023.
- United Fresh, n.d.-a. <https://unitedfresh.co.nz/>. Accessed 05 August 2023.
- United Fresh, n.d.-b. <https://unitedfresh.co.nz/About-Us>. Accessed 05 August 2023.
- United Fresh, n.d.-c. <https://unitedfresh.co.nz/Membership/Current-Members>. Accessed 05 October 2023.
- United Fresh, n.d.-D. <https://unitedfresh.co.nz/Technical-Advisory-Group>. Accessed 05 August 2023.
- United Fresh, n.d.-e. <https://unitedfresh.co.nz/Technical-Advisory-Group/United-Nations-Sustainable-Development-Goals>. Accessed 06 August 2023.
- United Nations, 2015. *Transforming Our World: The 2030 Agenda For Sustainable Development*.
- United Nations, 2020. *Food Systems Summit Dialogues Handbook For Independent Dialogues*.
- Unnevehr, L., & Hirschhorn, N. (2000). *Food Safety Issues In The Developing World* (Vol. 469). World Bank Publications.
- Usubiaga, A., Butnar, I., & Schepelmann, P. (2018). Wasting Food, Wasting Resources: Potential Environmental Savings Through Food Waste Reductions. *Journal Of Industrial Ecology*, 22(3), 574-584.
- Vazquez-Brust, D., Piao, R. S., De Melo, M. F. D. S., Yaryd, R. T., & Carvalho, M. M. (2020). The Governance Of Collaboration For Sustainable Development: Exploring The “Black Box”. *Journal Of Cleaner Production*, 256, 120260.
- Walker, P. T. (1983). Crop Losses: The Need To Quantify The Effects Of Pests, Diseases, And Weeds On Agricultural Production. *Agriculture, Ecosystems & Environment*, 9(2), 119-158.
- Wang, L., Xu, L., Zheng, Z., Liu, S., Li, X., Cao, L., ... & Sun, C. (2021). Smart Contract-Based Agricultural Food Supply Chain Traceability. *IEEE Access*, 9, 9296-9307.

- Wilson, T. P., & Clarke, W. R. (1998). Food Safety And Traceability In The Agricultural Supply Chain: Using The Internet To Deliver Traceability. *Supply Chain Management: An International Journal*, 3(3), 127-133.
- Xu, J., Bai, J., & Chen, J. (2019). An Improved Indicator System For Evaluating The Progress Of Sustainable Development Goals (SDGs) Sub-Target 9.1 In County Level. *Sustainability*, 11(17), 4783.
- Zhou, X., & Xu, Z. (2022). Traceability In Food Supply Chains: A Systematic Literature Review And Future Research Directions. *International Food And Agribusiness Management Review*, 25(2), 173-196.
- Zhou, X., Pullman, M., & Xu, Z. (2022). The Impact Of Food Supply Chain Traceability On Sustainability Performance. *Operations Management Research*, 15(1-2), 93-115.

