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Know Your “WHY”

Motivations for a Sustainable Future

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3 EXECUTIVE SUMMARY

With growing demands for sustainability in the food and fibre industries, there is mounting pressure from consumers to produce environmentally responsible products. This report addresses the necessity for the New Zealand dairy industry to prioritise climate change concerns and associated greenhouse gas emissions to secure a sustainable future.

The report aims to understand the motivations behind the adoption of new innovations by dairy farmers and learn how to accelerate the uptake of practices that reduce greenhouse gas emissions, thereby ensuring the long-term sustainability of farming in New Zealand. Additionally, the report aims to create a resource to inform government, industry bodies, and non-governmental organisations (NGOs) about alternative approaches to motivate farmers in reducing greenhouse gas emissions positively.

The research question guiding this study is: How can we motivate New Zealand dairy farmers to embrace practices that effectively reduce greenhouse gas emissions?

A literature review was conducted to gain insights into the significance of greenhouse gases in the New Zealand dairy industry. The review examined the impact and relevance of greenhouse gases within the New Zealand dairy industry. 23 semi-structured interviews were used to uncover the motivations that would drive New Zealand dairy farmers to adopt practices aimed at reducing greenhouse gas emissions on their farm. Responses were categorised into the following high-level themes:

- **WHY (belief):** Explored the aspects of purpose, motivation, social structure, and trust.
- **HOW (actions):** Focused on leadership, communication, and pathway implementation.
- **WHAT (result):** Addressed knowledge acquisition, problem definition, and barriers encountered.

Information gathered from the literature review and semi-structured interviews, highlighted the importance of understanding the "WHY" behind motivations and the utilisation of effective communication strategies ("HOW") to drive the adoption of sustainable practices within the New Zealand dairy industry.

Recommendations:

- **Leverage the intrinsic values and purpose that farmers already possess.** When developing GHG related communications to dairy farmers, industry partners should inspire farmers towards transformative change by building on farmers' existing intrinsic values and encouraging mastery to drive toward continuous improvement
- **Emphasise the importance of the economic benefits and social licence to operate.** Milk processors need to communicate to farmers and rural professionals the potential advantages of being market leaders in greenhouse gas emissions reduction and the consequences of falling behind.
- **Create a single location for information regarding greenhouse gas related resources.** Ministry for the Environment should provide and manage a resource location (i.e. website) for reputable GHG related literature, policies, regulations and general resources related to climate change specifically for the dairy sector.
- **Provide greenhouse gas emissions resources for veterinarians.** New Zealand Veterinarian Association (NZVA) should curate a list of reputable sources of information regarding greenhouse gas emissions regulations, mitigation strategies, and the economic advantages of adopting practices that reduce GHG emissions. As a trusted source of information, veterinarians can disseminate this information to dairy farmers.

4 INTRODUCTION

The Agricultural industry in New Zealand plays a crucial role in the New Zealand economy, society, and environment.

New Zealand is a major exporter of agricultural products. According to the Ministry for Primary Industries (2022), the food and fibre sector in New Zealand is responsible for approximately 81% of New Zealand's exports and is forecast to generate \$55 billion in export revenue by June 2030. The agricultural sector employs around 359,000 people which represents 13% of the total workforce with many rural communities relying on the sector for their livelihoods.

The world is currently facing a climate crisis, it is imperative that New Zealand looks more closely at the impacts of its environmental footprint. With agricultural emissions contributing close to 50% of New Zealand's gross emissions, (Ministry for the Environment, 2022) the New Zealand agricultural sector needs to balance the environment impact against the economic and community needs to maintain a sustainable agricultural industry.

Sustainability is achieved through the synergy between people, profit, and the planet which is visually represented by the Triple Bottom Line concept in figure 1 (Arslan & Kisacik, 2017). This concept acknowledges the importance of each element individually, highlighting the well-being of people, economic viability, and environmental preservation. By striking a balance between these three aspects, we can ensure a sustainable future that meets the needs of present and future generations.

The vision for this study is to ensure the long-term sustainability of dairy farming in New Zealand by finding a way to motivate New Zealand dairy farmers to develop a positive desire to explore strategies for reducing greenhouse gas emissions on farm. With farmers' buy-in and commitment to make changes, dairy farming in New Zealand can overcome challenges and have a positive and sustainable future.

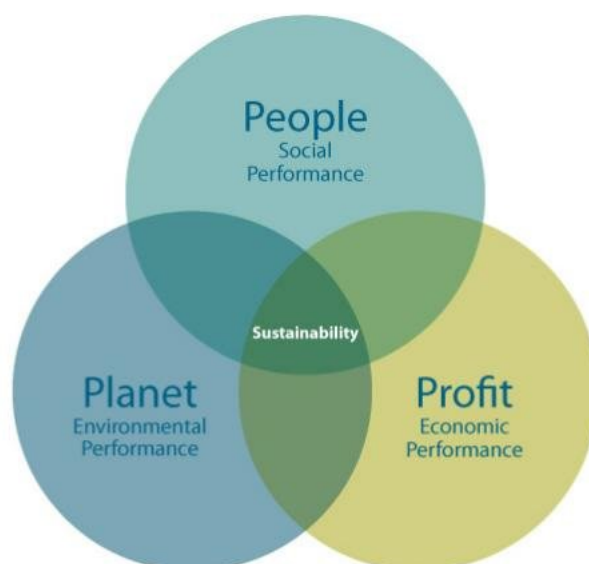


Figure 1: The Triple Bottom Line concept of sustainability reproduced from Arslan and Kisacik (2017)

Research Question: How do we motivate New Zealand dairy farmers to adopt practices that reduce greenhouse gas emissions?

Research Aims

1. To better understand what motivates New Zealand Dairy farmers to adopt new innovations and accelerate the adoption of practices that reduce greenhouse gas emissions on farms.
2. To create a resource that informs government bodies, industry organisations, and non-governmental entities about effective strategies for motivating farmers to reduce greenhouse gas emissions.

5 METHODOLOGY

1. Literature review: A literature review was undertaken to give the author background knowledge on the proposed greenhouse gas emissions regulations for New Zealand farmers, along with an understanding of the underlying chemistry of greenhouse gases. The review highlighted the abundance of resources available for New Zealand dairy farmers on WHAT to do and HOW to reduce greenhouse gas emissions on farm. Additionally, the literature review delved into the decision-making processes employed by New Zealand farmers and their capacity to adapt to new regulations and practices.
2. Interviews: Semi-structured interviews were chosen to allow room to move away from set questions and encourage a rich conversation to capture ideas and feelings that may have been missed with a more rigid approach. A total of 23 semi-structured interviews were conducted. Thirteen New Zealand dairy farmers, nine industry partners, and one motivational coach. Interview questions were chosen to collect valuable insights regarding multiple aspects: the obstacles or barriers hindering the adoption of practices that could reduce greenhouse gas **(GHG)** emissions; the influential factors impacting the adoption of such practices; the overall comprehension of GHG; the potential effects of proposed regulations on farmers and their existing farming methods and the motivation for making positive changes towards reducing GHG emissions. The interview questions varied slightly between the farmers and the industry partners.

Interviews were conducted that encompassed a broad range of dairy farm systems that represented a cross-section of farm types, business scope and scale, financial situations, life stages and interest in climate change. Industry partners included key businesses and organisations that have an influence on or involvement with dairy farmers in New Zealand. For example, fertiliser companies, milk processors, farm advisors, media outlets, researchers, and government organisations involved in the dairy industry. The semi-structured interview questions can be found in the appendix.

3. Thematic analysis

Thematic analysis was carried out utilising the technique outlined by Braun and Clarke (2006). Interviews were transcribed in full, then each idea or pocket of thought was summarised into a single word, these 'pocket thoughts' were then grouped together into key themes. The key themes were summarised visually in a mind map using Miro software (See Figure 7). These key themes were then grouped into higher-level themes, framed around Simon Sinek's Golden Circle (Sinek 2009). The Golden Circle is a framework that emphasises the importance of starting with the "WHY" in order to motivate people and create a sense of purpose. It is based on the idea that people are more motivated by the purpose and values behind a goal than by the goal itself. The goal in this case is reducing greenhouse gas emissions on farms.

According to Sinek, decision-making starts in the limbic portion of the brain, the portion responsible for feelings, trust, and loyalty which is why understanding the "WHY" is so crucial. People then communicate the "WHAT" from the brain's neocortex portion, which is responsible for analysis and language (See Figure 2). By inspiring decision-making from the inside out, we create a sense of purpose and vision that can motivate people to take action now and sustain that into the future. Therefore, The Golden Circle was chosen to organise interview themes as it aligns with the research aim of motivating sustainable farming practices crucial for the future prosperity of the sector.

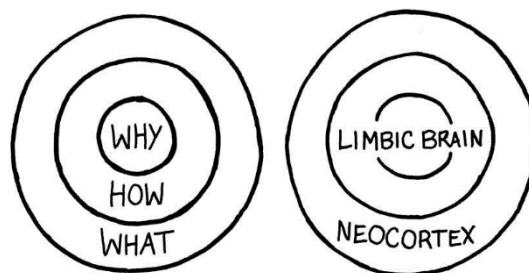


Figure 2: Simon Sinek's Golden Circle 2009

Gutnik et al. (2006) explored the role of emotion in decision-making, and supports the idea that emotion, particularly involving the limbic brain, plays a vital role in decision-making. The authors acknowledge the significance of emotional and subconscious influences in the decision-making process.

Dan Pink's talk on motivation (Pink 2010) further supports the idea that emotional and intrinsic factors like purpose, mastery and autonomy, are more effective at motivating people than extrinsic factors like rewards or punishment. This aligns with the idea that organisations can utilise people's existing values and beliefs to create sustained behavioural change and engagement on a deeper level. The question arises, have we motivated New Zealand dairy farmers from the inside out?

6 LITERATURE REVIEW

This review considers what greenhouse gases are and why they are important to the New Zealand agricultural sector. It's important to consider what is meant by the term sustainability and the actions required to ensure future generations have the opportunity to farm in the dairy sector. It will touch on concepts of motivation and decision making to understand how to encourage adoption of a new idea or innovation, and the role communication plays in the dissemination of an idea through a social system.

6.1 What is sustainability?

Sustainability encompasses the concept of meeting the needs of present and future generations while ensuring profitability, environmental health, and social and economic equity, according to the Food and Agriculture Organization of the United Nations (FAO, 2022). The Oxford Dictionary (2023) defines sustainability as the responsible use of natural resources and energy without harming the environment, with an emphasis on long-term continuation. Potentially it is an ever-evolving approach to farming that aims to preserve resources for future generations while maintaining the current way of life.

Kuhlman & Farrington (2010), suggested separating the present needs and future needs with the terms "well-being" and "sustainability". Well-being represents the social and economic dimensions in the 'triple bottom line' (figure 1) while sustainability focuses on the environmental dimension. The goal of sustainability is to strike a balance between environmental stewardship and improved quality of life and involves determining to what extent these two objectives can be balanced.

6.2 What are greenhouse gases and why do they matter?

NIWA (2021) defines greenhouse gases (GHG) as gases in the Earth's atmosphere that trap heat. They play a significant role in warming the Earth's surface by trapping infrared radiation and redirecting it in various directions, including back to Earth. This natural process, known as the Greenhouse Effect, is responsible for maintaining a habitable climate. NIWA (2021) states that human activities have led to increased levels of greenhouse gases, raising concerns about potential severe global warming and detrimental climate changes. Man-made greenhouse gases include carbon dioxide (CO₂), methane (CH₄), and nitrous oxide (N₂O); natural greenhouse gases encompass water vapor (H₂O), carbon dioxide (CO₂), methane (CH₄), and nitrous oxide (N₂O).

As global temperatures increase and the climate changes in New Zealand and around the world, it may become more difficult to farm using current methods. In a report by the New Zealand Agricultural Greenhouse Gas Research Centre (NZAGRC, July 2022) impacts of climate change include more extreme rainfall, increased drought, and significant impact on ryegrass growth and animal performance.

The Paris Agreement is an international treaty that aims to address and combat climate change by limiting global warming and reducing greenhouse gas emissions. It was adopted by 196 parties on December 12, 2015, under the United Nations Framework Convention on Climate Change (UNFCCC).

The Paris Agreement aims to:

- keep the global average temperature well below 2°C above pre-industrial levels and limit the temperature increase to 1.5°C
- strengthen the ability of countries to deal with the impacts of climate change
- make sure that financial flows support the development of low-carbon and climate-resilient economies.

Under the Paris Agreement, New Zealand has committed to reducing carbon dioxide equivalent emissions to 50% below 2005 levels by 2030 (New Zealand Agricultural Greenhouse Gas Research Centre (NZAGRC), July 2022). This commitment is particularly important for New Zealand, as the agricultural industry dominates New Zealand's greenhouse gas emissions profile, contributing to 50 % of gross greenhouse gas emissions by sector. (New Zealand Greenhouse Gas Inventory 1990-2020). Figure 3 is a visual representation of New Zealand's greenhouse gas emissions by sector and illustrates the significant proportion of emissions from agriculture, specifically the dairy sector. Methane (CH₄) and nitrous oxide (N₂O) are the two main greenhouse gases associated with agriculture. Methane is the most significant contributor and is mainly generated by livestock, such as sheep and cattle. Figure 4 is a visual representation of methane and carbon dioxide emissions in cattle and how they contribute to climate change.

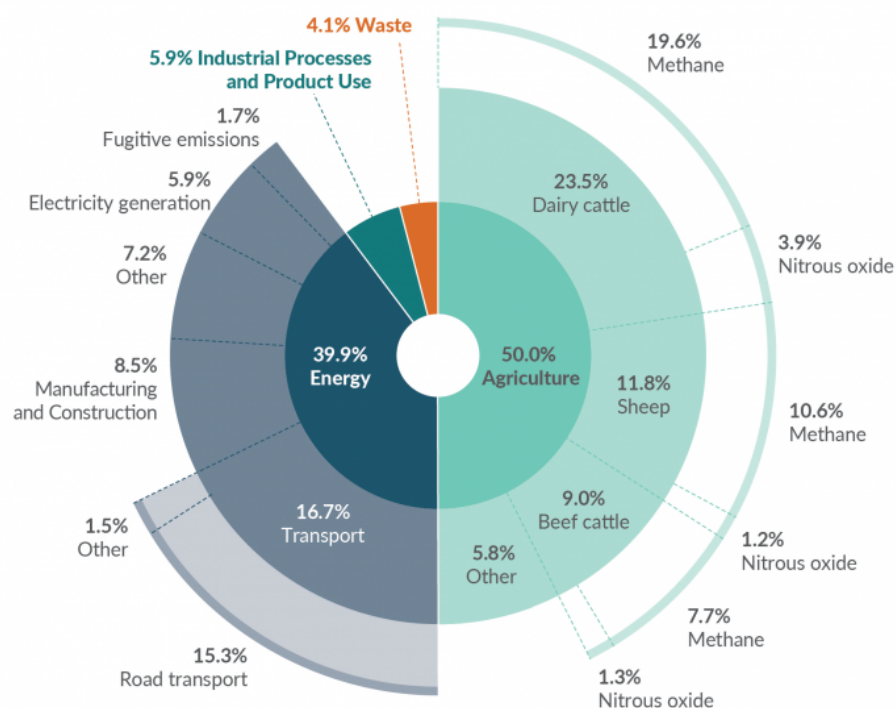


Figure 3: Breakdown of New Zealand greenhouse gas emissions by sector. (From MfE: New Zealand Greenhouse Gas Inventory 1990-2020, 2022)

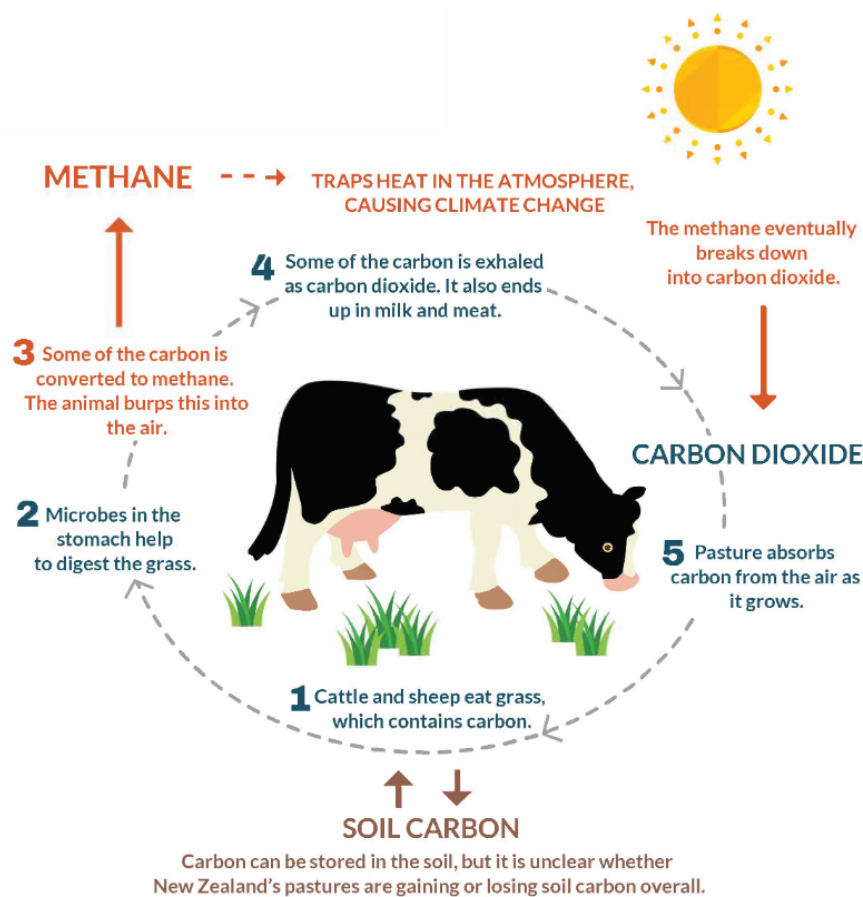


Figure 4: How methane from livestock contributes to climate change (From MfE: Agriculture emissions and climate change. 2023)

6.3 Why are greenhouse gases important to New Zealand?

With agricultural products accounting for approximately 81% of New Zealand's trade (Ministry for Primary Industries 2022) and serving as a vital portion of the economy, the implications of greenhouse gases on exports become even more critical. Maintaining market access, favourable free trade agreements, and minimising trade barriers are essential to preserve the significant contribution of agricultural exports to New Zealand's economy.

New Zealand's trade policy (New Zealand Foreign Affairs and Trade, 2023) recognises that overseas markets provide the opportunity for New Zealand businesses to grow to a scale that could not happen in New Zealand alone, without trade agreements a significant portion of New Zealand's primary industry would cease to exist.

NZ trade policy suggests there has been significant growth in regional and bilateral free trade agreements (FTAs) across the globe since 2000. As other countries establish new trade networks through these agreements, New Zealand must also seek out new FTA partners to avoid putting its exporters at a disadvantage. New Zealand's lead trade negotiator Vangelis Vitalis (Vitalis, personal communication, May 17, 2023) emphasises the increased importance New Zealand's FTA partners are placing on climate change and Scope 3 emissions during FTA bilateral negotiations. In Vitalis' view, failure to address these emissions could be a barrier for future market access with FTA partners.

6.4 What is Scope 3?

Scope 3 emissions represent indirect emissions upstream and downstream of a company's supply chain and are important for organisations to consider in their carbon footprint calculations. While existing protocols focus on direct emissions (Scope 1) and emissions from purchased energy (Scope 2), Scope 3 emissions account for over 75% of an industry sector's

carbon footprint on average (Huang et al. 2009). By understanding their Scope 3 footprints, companies can identify opportunities for emissions reduction across their supply chains, not just within their own operations. This is particularly relevant for major food and beverage processing companies that contribute significantly to food system emissions. Calculating and reporting Scope 3 emissions enhances corporate accountability and empowers consumers to make informed purchasing decisions based on a brand's social and environmental impact (Schulman et al. 2021).

For instance, Fonterra, a prominent milk processor, will incorporate GHG emissions from its dairy suppliers into their Scope 3 emissions in the near future. Farms supplying milk to Fonterra account for the largest portion of Fonterra's Scope 3 emissions (Fonterra Annual Review, 2021), this will have an impact on Fonterra's expectation of its dairy farmers.

6.5 What drives change?

Several research papers have researched the factors that drive farmers to change their practices and adopt sustainable agriculture methods.

Rosario et al. (2022) addressed the factors that influence sustainable agriculture adoption. The paper highlighted the importance of selecting relevant factors and accurately measuring intrinsic factors, such as attitudes, beliefs, norms, values, social influence and motivations within the agricultural context. This emphasises the need to understand the social and psychological aspects that influence farmers' decision-making processes.

Adger et al. (2008) explored the concept of limits to adaptation and emphasised the intrinsic connection between society and adaptation. The authors argued that values, ethics, risk perception, knowledge, and cultural factors significantly influence the limits of adaptation. These factors shape how society perceives and responds to various challenges and changes, imposing constraints on the extent to which adaptation is possible. This highlights the importance of considering the societal and cultural context when implementing changes in agricultural practices.

In line with these findings, the study by Ag first (2018) aimed to investigate the social and behavioural barriers hindering the adoption of practices that mitigate greenhouse gas (GHG) emissions on farms. The research identified several factors influencing farmer behaviour and behaviour change. Environmental issues, including GHG emissions, present barriers to behavioural change, the perceived advantages of current practices, compatibility with existing farming systems, complexity of the issue, and the visibility of the outcomes resulting from change. AgFirst (2018) suggested that overcoming barriers and promoting behavioural change requires a multifaceted approach. The recommendations included pricing mechanisms for biological emissions, providing mitigation options, recognising on-farm mitigation efforts, and offering information and advice to farmers. Understanding and addressing these social and behavioural factors are essential for driving change and encouraging the widespread adoption of sustainable practices that reduce GHG emissions in agriculture.

These studies collectively highlight the significance of intrinsic factors, cultural context, values, and ethics in shaping farmers' decisions and actions. By considering these factors and implementing targeted strategies to overcome barriers, it becomes possible to drive positive change toward sustainable agriculture and mitigate the environmental impacts of farming.

6.6 How do we communicate innovation and change?

Change doesn't happen without the conscious decision to make it happen. Change requires a deliberate and intentional choice to set things in motion. Change at a community level or industry level requires the adoption of innovations across a population by

communication. This process has been well described in a renowned book by Everett Rogers: *Diffusion of Innovations* (2003). Rogers, explains how new ideas, technologies, products, or practices spread and are adopted within a population. The theory describes the process through which innovations are communicated and accepted by individuals or groups over time. Rogers uses a bell curve known as the adoption curve or diffusion curve to visually show how the adoption of an innovation spreads over time within a population or social system (Figure 5). Each population contains 5 categories that have specific modes of communication depending on the characteristics of the social system and the traits of the adopters, like the willingness to try new things, social status, and risk appetite.

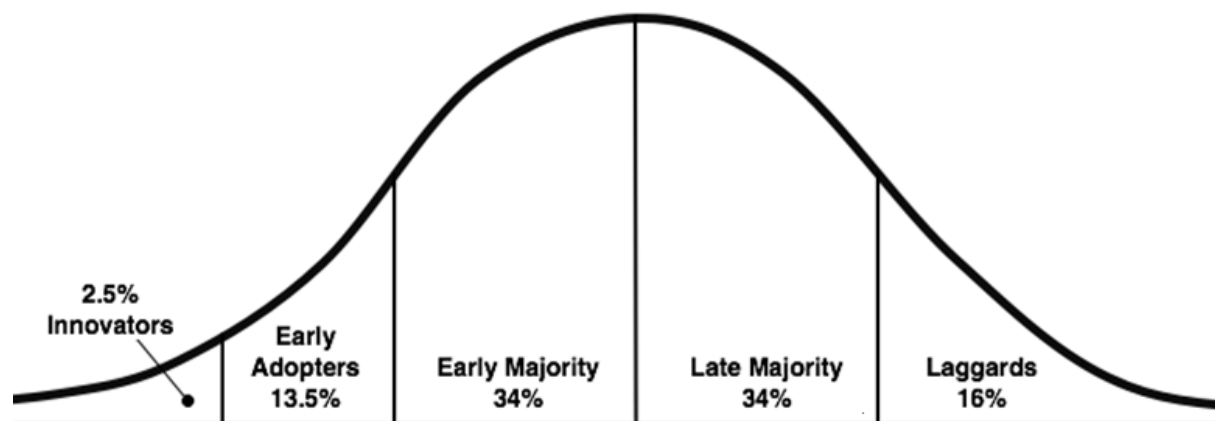


Figure 5: Adopter Categorisation on the basis of Innovativeness. Rogers 2003

The adoption curve consists of five categories of adopters:

Innovators: often motivated by a vision of the future, they have a strong desire to try new ideas. They can be motivated by the excitement to discover something innovative and being first. Communication is through friendships with other innovative people, they often engage in forums, discussion groups and conferences with likeminded individuals. They are often first to adopt the innovation as they are risk-takers with financial resources.

Early Adopters: Have higher social status, influence, and more extensive communication networks. They act as opinion leaders to inspire others to adopt and primarily communicate with innovators and other early adopters. They are motivated by the competitive advantage of an innovation, social status and finding solutions to a problem.

Early Majority: They are an important link in the diffusion process as they make up a significant portion of the population. Their adoption serves as social proof and reassurance for the late majority and laggards, who may be more hesitant to adopt an innovation. Their decision to adopt implies that the innovation is practical, reliable, and beneficial which reduces perceived risk, making it more appealing to the late majority and laggards. The early majority relies on interpersonal communication and social networks within their category (e.g. farmer to farmer communication) and seek advice from a variety of sources.

Late Majority: They are cautious and adopt the innovation once it has become well-established and widely accepted. They may be motivated by social pressure to conform to social norms and expectations. They can be motivated by the increasing affordability and availability of the innovation over time and adopt because of economic necessity. They communicate through personal interactions, media and online research of industry-specific sources.

Laggards: Represent a small percentage of the population and have limited exposure to early adopters or influencers who might motivate them to adopt an innovation. Traditional and often lacking social networks and resources, they directly engage with trusted individuals and sources in their local communities. They are resistant to change and need to be certain that the innovation will work before adoption or wait until it becomes absolutely necessary.

According to Rogers (2003), the diffusion of innovation theory is a tool for understanding how to effectively communicate with different segments of the population, thereby increasing the likelihood of successful adoption of an innovation. By categorising individuals into distinct groups based on their adoption behaviours, you can tailor communication strategies to meet the specific needs and motivations of each group.

6.7 Who should communicate?

Geoffrey Moore (2014) the author of *Crossing the Chasm*; builds on the concept of the diffusion curve but argues that there is a gap or “chasm” where communication of innovation or ideas does not occur between the early adopters and early majority. To ensure the success of an innovation, this gap needs to be bridged by using trusted sources of information that can connect early adopters with the early majority. Moore refers to these connectors as professional aids.

In a survey by Landcare Research (2022) designed to understand the preparedness of the agricultural sector for a potential emissions pricing mechanism, farmers were asked if they used rural professionals, farm advisors, or consultants for a variety of categories. Most farmers (78%) use rural professionals for various activities. Dairy farmers are more likely to use rural professionals (88%) than sheep and beef farmers (71%) (Figure 6).

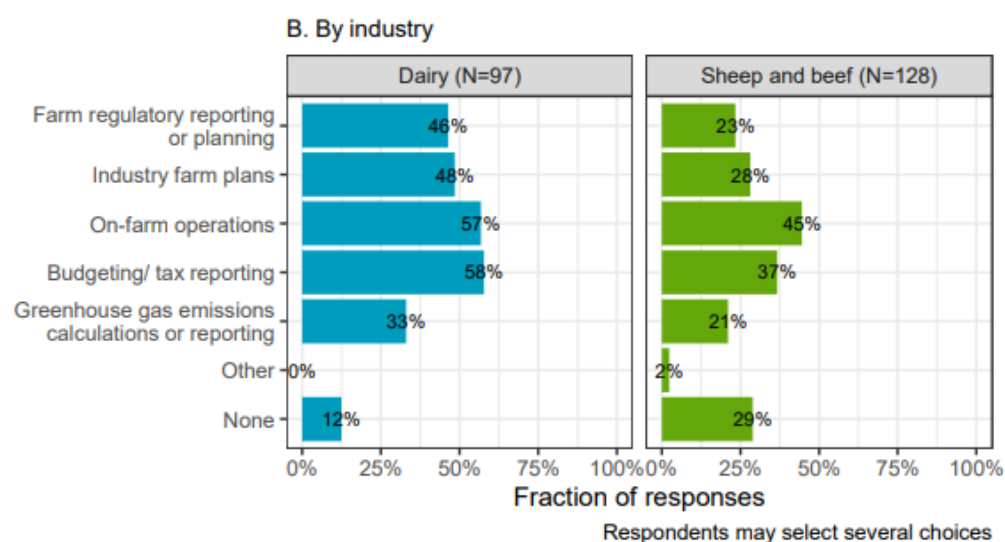


Figure 6: The use of rural professionals, farm advisors, or consultants for various activities on farm. Landcare Research. (2022)

A study by Small et al. (2015) found that amongst rural professions/aids veterinarians ranked as the most trusted source of information for farmers, followed by other farmers/farmer forums, placing scientists and organisations that represent primary industry lower on the scale.

7 ANALYSIS & RESULTS

Interviews were chosen as part of the research to gain the unique perspectives of farmers and industry partners. By directly engaging with farmers the social, cultural, and environmental factors that shape on farm behaviours could be explored.

The literature review highlighted the significance of emotions, values, and beliefs in the decision-making process. To assess if the information and motivation regarding GHG and climate change resonated with farmers on a deeper level, Simon Sinek's Golden Circle (WHY, HOW, WHAT) in figure 2, was employed to categorise the interview responses. This framework allowed for a comprehensive understanding of how farmers perceive and engage with GHG and climate change-related issues, based on their underlying motivations and beliefs.

- WHY (belief): Explored the aspects of purpose, motivation, social structure, and trust.
- HOW (actions): Focused on leadership, communication, and pathway implementation.
- WHAT (result): Addressed knowledge acquisition, problem definition, and barriers encountered.

7.1 WHY (belief): Purpose, Motivation, Social structure, Trust

Purpose: It became evident that a large majority of farmers interviewed lacked a comprehensive understanding of the rationale or the "WHY" behind reducing greenhouse gas emissions from a marketing perspective. Farmers seemed less aware of the implications for New Zealand dairy farmers should they fail to act. Although they acknowledged the vital role of environmental stewardship, many struggled to see how New Zealand's efforts could make a meaningful difference in the global GHG crisis:

"We're not making a big difference in the big picture"

"Our ranking is one of the greenest, the most efficient producers of milk in the world and [we will] still get that premium for our price"

"China and Russia will still spew it out [emissions] so it doesn't matter what we do"

"It's a drop in the hat compared to countries like China or Russia"

"I won't go down the line of believing some of this scare mongering people that are out there saying if we don't do it, we're not going to sell our cheese, there's guys there that have got no cheese, they're eating dirt. If they had a bit of money they'd buy cheese".

*"Taxing our farmers with greenhouse gases, given that we sell mostly a dirty old commodity, do you think China is going to care that we're taxing our farmers? Think [they] give a ****. Commodities are price sensitive. No one's gonna [sic] care".*

In contrast to the farmers, industry body representatives indicated a clear understanding of the market implications of not maintaining New Zealand's world-leading position in GHG emissions reduction. They were acutely aware of the underlying reasons, such as the need to secure a social licence to operate, the growing trend of emissions output requirements for potential bank lending, and the significance of Scope 3 emissions.

Motivations: Farmers demonstrated a genuine desire to make a positive impact on the environment regardless of any regulations, they are fully aware of the necessity for action.

The majority of those interviewed have made changes on farm to improve water quality, biodiversity and have planted portions of farm in native trees, riparian plantings, or forest.

"Just suck it up and do the right thing. It's here. It's coming. It's not like it's going to get repealed". [emissions regulations]

"I mean, we're not gonna [sic] get any credit for planting out the drain banks or anything like that, but we just simply do it. Cause it's the right thing to do."

Interestingly the majority of farmers interviewed were motivated to pursue a career in dairy farming for the economic benefits and potential capital gains rather than a love of animals or being outdoors.

Social structure: The negative public perception of dairy farming in New Zealand emerged as a prominent theme among the interviewees. It was apparent that all the farmers interviewed had their own perceptions of farming that they felt did not align with the views held by the general public.

Farmers perceptions of themselves:

"We are already doing a good job"

"Farmers, they, they [sic] are intrinsically motivated to look after the environment".

Farmers presumed public perceptions:

"The ideas that the fringe has about dirty farmers and that leaks into their sort of the general consensus. They [government & industry] shouldn't only educate and motivate farmers, but they should also educate our society, in the positive things that New Zealand farming does."

"Public don't hear and see what we are doing well, it doesn't get through to the person in Auckland drinking their latte".

"there's no point in letting our urban friends say, well, you've done nothing about our greenhouse gas. You've done nothing about effluent pollution or irrigating on wet days or nitrogen in rivers".

Many interviewees, farmers, and industry alike, believed the public thought of the industry as "Dirty dairy". But only the farmers thought the dairy industry was being unfairly targeted compared to other industry sectors including transport.

Trust: Conversations had a subtle undertone of politics and a certain degree of distrust in the scientific study of greenhouse gas (GHG) emissions. Additionally, there is a lack of clear communication regarding the research being conducted into carbon sequestration and the measurable outcomes that can be expected from such efforts. Farmers are seeking assurance regarding the intentions behind the regulations put in place, with a desire for policies to be aimed at benefitting the farmers and the greater good, rather than being used as a political tool.

"it's been a politician driven initiative and we know what politicians [are] about they can be pretty deep to bending the truth and creating and picking the things out that will suit their narrative. So as long as it's been peer-reviewed and independently verified. Then I'm happy with whatever number comes".

"I'm not across the numbers so probably the only thing I would really like is that it [sic] whatever number they come up with is fine as long as it's backed by some credible science".

"We are in danger of wrecking our own economy".

"if national get in then this will be on the backburner"

Industry partners had trust in the science and fewer political comments:

"25 years ago we wouldn't even be having this conversation because 25 years ago, you know, science was done by scientists and they were trusted."

7.2 HOW (actions): Leadership, Communication, Pathway

Leadership: Farmers are experiencing a sense of disconnect and inadequate cooperation among industry partners. This has resulted in conflicting advice being provided and a lack of clear messaging around potential mitigations and readily available solutions. Consequently, there is a distinct absence of a definitive roadmap for farmers to follow and a lack of confirmed regulations to provide guidance. This has led to a feeling among farmers that there is no clear direction to take and no clear pathway to follow. They know what they are doing now but what does the future look like?

"So yeah, we've heard a lot. In that sense, we haven't heard a lot from industry leaders about what they're doing apart from, you know, seeing some slogans and seeing some pictures come through in some farming magazines, etc, but it's not been hands-on enough".

"The left hand isn't talking to the right hand".

"We need to sing from the same song sheet, meaning industry has to be telling the farmers the same things that governments telling the farmers".

Pathway: Farmers are willing to make more changes and are waiting for a clear direction.

"There's no goal posts, so you don't know where to kick the ball to score, I think the regulators are reluctant to put the goal posts in, simply because that represents a definitive point".

Communication: Interviews suggest that communication of greenhouses gas emissions and their mitigations came from lots of different sources. There was no singular source of information that farmers used. Many relied on emails from Dairy NZ and milk processors or asking rural professionals or rural consultants for information while on farm. Indicative results suggested farmers found a lack of knowledge from rural professionals in climate change topics. However, Fonterra's insights farm report provided to their milk suppliers recommends seeking assistance from rural professionals: *'There's a lot to take in, so I'd encourage you to get in touch with the Farm Source team, or your rural professional, to support you if required'*. Rural professionals were identified by farmers as veterinarians, AB technicians, fertiliser consultants, FarmWise consultants, and Genetic material consultants.

7.3 WHAT (result): Knowledge, Problem definition, Barriers

What are farmers doing already: The interviewed dairy farmers in this report have implemented a range of measures, including reducing cow numbers, tree planting (native and pine), decreased fertiliser use, and striving for operational efficiency. These measures were implemented with considerations such as environmental preservation, ethical responsibility, and operational efficiency in mind, rather than solely focusing on reducing greenhouse gas emissions.

Knowledge: During the interviews, farmers expressed uncertainty about their understanding of greenhouse gas emissions. However, when asked specific questions, the interviews revealed that dairy farmers possessed a strong base knowledge of greenhouse gas chemistry and were aware of various mitigation strategies that could be implemented on their farms to reduce emissions.

Farmers however did have a distinct knowledge gap when it came to discerning between the customer and the consumer. They held the belief that the consumer was the customer, with limited understanding or appreciation of the intricacies involved in the supply chain or the specific product being provided.

"China will still buy our milk even if we do nothing"

"....providing milk for China"

"People are going hungry...the third world [countries] will buy our milk"

Barriers: Barriers were talked about as challenges facing the dairy industry currently. Interestingly in discussion GHG emissions regulations were never mentioned as a current challenge facing the dairy industry. The main challenges consistently identified by dairy farmers in the interviews were staffing issues and increasing administrative workload due to regulations. These barriers pose challenges as they divert time and resources away from farm operations and the additional administrative costs cannot be transferred to the end consumer.

"In other industries you can increase your profits in two ways, one by reducing your costs and the other one is by increasing your sales. By advertising, by finding new markets, and that's what you can't do in dairy farming.... And the only way to increase your profit margin is by reducing your costs".

"That's very costly for you, you need to put a lot of time and effort in" [administration for regulations].

It was difficult for farmers to articulate the barriers to implementing practices that reduce GHG emissions as many suggested they were doing what they could and waiting for methane mitigations to be available. Some identified attitude towards change as a barrier.

"... you need to wake them up and convince them".

"Probably a lot of it's attitudinal if you look at the current generation of farm owners".

When asked about what they would change in the GHG regulations, most farmers did not have suggestions but wanted the science of the measurements to be accurate and have simple steps to follow for implementation.

"short, snappy summary with the implications of doing nothing & how to contribute".

"It's just what is what is the least amount of pressure or pain points that everybody can live with".

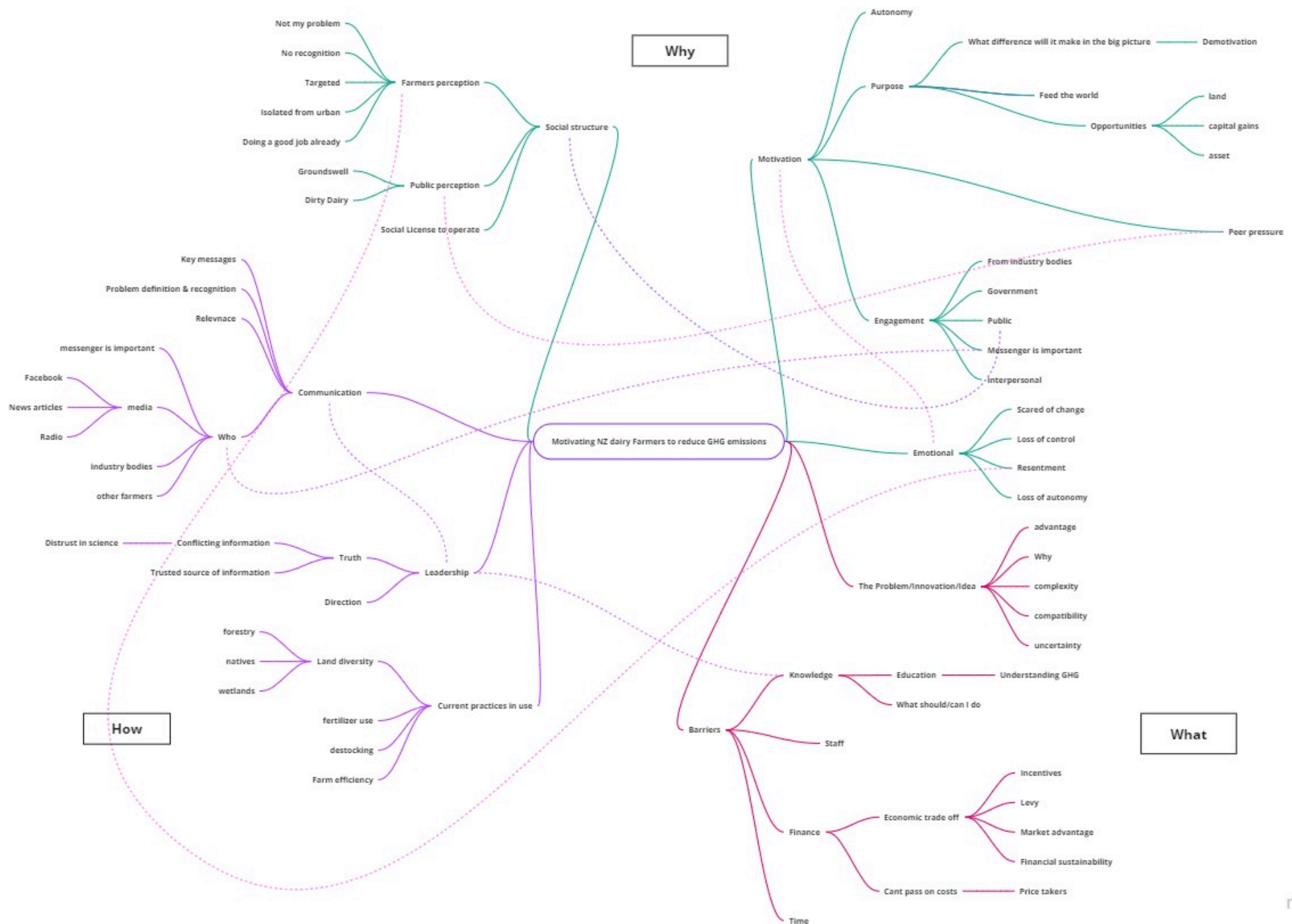


Figure 7: A mind map showing the key themes generated from semi structured interviews. The themes are categorised based on Simon Sinek's Golden Circle (WHY, HOW, WHAT). The dashed lines represent common links between themes.

8 DISCUSSION

The discussions section is an opportunity to evaluate the insights gained in the literature review and compare this with the experiences and views of the semi-structured interviews. The Triple Bottom Line concept, depicted in Figure 1, serves as a valuable framework for illustrating the essential elements of sustainable farming and the interdependence among the three elements. However, the framework lacks a crucial component, namely the motivation or purpose behind each aspect (people, planet, profit) and the way that it is communicated to farmers. Motivation plays a significant role in the context of the triple bottom line by influencing individuals' attitudes, behaviours, and decision-making processes related to economic, social, and environmental aspects.

8.1 Motivation:

Interviews identified a solid base knowledge of greenhouse gas chemistry and mitigation strategies amongst farmers. This suggests there have been effective resources and communication efforts in place to provide farmers with information regarding "WHAT" to do to reduce greenhouse gas emissions. Farmers were aware of mitigation strategies including potential innovations into methane mitigation; therefore, they have been exposed to information about potential solutions and practices they can implement on farm or the "HOW" to reduce greenhouse gas emissions.

The piece which is missing in the communication of greenhouse gas emission reductions is the "WHY" or the purpose for making these changes. The environment has been over-emphasised as a reason to reduce greenhouse gas emissions on farm, but little emphasis has been placed on the economic and social opportunities. This does not align with farmers' motivations to farm, as interviews suggested the driving force behind pursuing a career in dairy farming is primarily economic.

If we come back to Simon Sinek's Golden circle, the deeper "WHY", the very reason for our desire to farm has not been identified and used to motivate change. What is our purpose or our vision as a sector? Why do we farm?

"There are only two ways to influence human behaviour, you can manipulate it, or you can inspire it" (Sinek 2009). This quote emphasises the importance of motivation in shaping human behaviour. In the context of the agricultural sector, motivation plays a significant role in driving sustainable practices and bringing about meaningful change. Motivation can stem from both intrinsic and extrinsic factors.

The literature review highlights the importance of intrinsic factors (values and purpose) in farmers' decision-making over extrinsic factors (rewards and recognition. According to Adger et al. (2008), the process of adapting to climate change is often hindered by internal factors, including values, perceptions, and decision-making processes. The way society perceives and evaluates risks also plays a crucial role in determining the extent of adaptation measures taken. In some cases, if a society does not perceive the risk associated with climate change as significant enough, it can become a limiting factor in taking necessary actions.

In contrast, farmer interviews revealed a lack of understanding and awareness regarding the risks associated with not taking action to reduce greenhouse gas emissions on farms. The farmers' focus was primarily on the consumer as the customer and the belief that food security alone would drive sales. This indicates a gap in knowledge and communication surrounding the potential market access risks associated with unsustainable farming

practices. The disproportionate focus on the environmental aspect of GHG has led to an underrepresentation of the economic and social dimensions of sustainability.

Farmers often prioritised the immediate well-being of themselves and their farms over considerations for the future environment. They tended to focus on the present state of their operations, believing that they are taking care of the environment in the here and now. However, their attention to future environmental concerns may be limited due to a perceived inability to make a significant difference and a preoccupation with current immediate pressing issues such as staffing issues and profitability. This was evident when none of the interviewed farmers identified GHG emissions as a current challenge in the dairy industry.

Simon Sinek said that people don't buy "WHAT" you do, they buy "WHY" you do it. The threat of other countries eventually competing with New Zealand in terms of GHG emissions means it is important that we sell the "WHY" of farming in New Zealand. What drives our actions? During the interviews, two distinct "WHYs" emerged. Firstly, there is the "**why we should do it**," which encompasses the advantages and risks associated with the proposed changes. It became evident that these aspects, particularly related to the well-being of farmers, were not effectively communicated. However, there is also the "**why we do it**" or the reason why it is essential to continue the current practices in New Zealand. This narrative revolves around the concept of feeding the world, highlighting the natural pastoral grass system and the farmers' connection to the environment.

Farmers intrinsically care deeply about the environment, biodiversity, animal welfare, and producing a wholesome, ethical product that contributes to global food security. Capturing and sharing the vision is not only important to the farmers interviewed but important to selling the "WHY" or the point of difference in New Zealand's products. Tapping into farmers' desires to be exceptional and environmentally conscious in their farming practices, can harness and amplify this motivation. Encouraging farmers to embrace their existing values and mastery can foster a drive for continuous improvement. By building upon this foundation, farmers can be motivated to exceed their current performance and strive towards even greater excellence.

8.2 Communication:

The messenger is important: Rogers (2003) diffusion of innovation theory explains how communication plays a vital role in the diffusion of an idea or innovation through a social population. Geoffrey Moore (2014) builds on this concept in his book "Crossing The Chasm" where he offers valuable strategies to bridge the gap between early adopters and the early majority. Moore identifies this transition point as the "chasm" that determines whether innovations or ideas succeed or fail to gain widespread adoption within a population. One of the key elements to crossing this chasm is using professional aids such as consultants to bridge the gap between early adopters and the early majority. Within the New Zealand dairy sector, these would be our rural professionals like veterinarians, company reps, and farm advisors.

This idea is supported by real-world examples in a book called "The Tipping Point" by Malcolm Gladwell. Gladwell (2002) examines various case studies and real-life examples to identify the factors that contribute to the tipping point phenomenon including communication of ideas by 'connectors' - individuals with vast social networks within the early majority category.

Interviews suggested that farmers regularly asked rural consultants for advice and facts on greenhouse gas emissions but identified a knowledge gap and underutilisation of our rural professionals and or consultants in communicating the risks and opportunities of GHG reductions to New Zealand dairy farmers. There is an opportunity to use our rural professionals or professional consultants to highlight the economic and social advantages of reducing GHG emissions on farm and bridge the gap between early adopters and early majority.

The message is just as important as the messenger: As identified in the literature review, there is a vast amount of information available surrounding greenhouse gases. Farmer interviews identified a lack of knowledge from rural professionals around GHG or potential regulations. A point source of information is needed to help educate rural professionals so they can act as 'connectors' to communicate information to the early majority and speed up the adoption of GHG reductions practices.

As outlined by Moore (2014) *Crossing the Chasm*, communication from professional consultants is a key aspect of bridging the gap between early adopters and early majority. There could be a significant improvement to the uptake of GHG reduction practices with fewer resources by using veterinarians to communicate with the early majority farming community, compared to open marketing approaches when communicating innovations.

8.3 Elements of the Triple Bottom Line

People (Social Sustainability): The social aspect of sustainability includes employees, customers, suppliers, local communities, rural professionals, and consumers.

During the interviews, it became apparent that farmers lacked clarity on the distinction between the customer and the consumer. They mistakenly identified the customer as the consumer. The differentiation is crucial because it shifts the focus from understanding the wants of the consumer to comprehending the long-term requirements of the customer, which are very different. The customer in this case is multinational corporations operating in the food and beverage industry (Figure 8).

In contrast to this, the industry bodies interviewed indicated a comprehensive understanding of the customer vs the consumer. Indicative interview results suggested milk processors waited for direct indications from customers before they started on the journey of indicating to farmers the importance of the role of greenhouse gas emissions and climate change to the value of the product they were supplying (personal communication, milk processor, May 19, 2023)

While the current consumer may not prioritise purchasing low-carbon products, the customer recognises the need to prepare for future buyers who will inevitably demand such products. Nestle (2022) for example, as a customer, exhibits an interest in understanding the impact of scope 3 emissions on climate change. Their particular focus lies on Scope 3 emissions, as 95% of Nestle's carbon footprint is made up of Scope 3 emissions from activities in its supply chain such as farming and land use. Dairy and livestock ingredients are the largest single source of Nestle's emissions – dairy alone accounts for one-third of the total emissions (Nestle 2022).

To achieve their climate ambitions, Nestle aims to reduce Scope 3 emissions by sourcing 20% of key ingredients through regenerative agriculture methods by 2025, and increasing it to

50% by 2030. Their Net Zero Roadmap, available on the Nestle website, outlines the strategies they are implementing to achieve these goals.

The customer does not have to rely on New Zealand alone for low carbon product, as several other countries for example Ireland, Canada and Brazil, are proactively making changes to reduce GHG emissions (NZAGRC 2022). Nestle is engaged in active research with pilot farms to explore methods of reducing scope 3 emissions but are also considering the increased production of dairy-free products; in 2021 Nestlé Professional launched two new plant-based dairy alternative products in Greater China (Nestle 2022).

If New Zealand wants to continue to sell to customers like Nestle, it's important to recognise the competitive nature of the market and our relatively small size as suppliers, understanding that we may have limited opportunities to stand out. New Zealand's reputation for efficient dairy farming is often showcased in marketing campaigns, industry publications, and international trade promotions. It becomes essential to prioritise keeping up with greenhouse gas emissions reductions to remain relevant in the market.

Sinek implies that knowing your purpose or “WHY” becomes more important if you no longer can offer something novel in the market. Having a clear vision of why New Zealand farms the way they do may be the only opportunity for New Zealand to differentiate itself from other countries as the carbon footprint gap between producers narrows.



Figure 8: Reproduced from Oxfam. *Behind the Brands. Food justice and the 'Big 10' food and beverage companies.* February 2013. www.oxfam.org

Social licence to operate:

The importance of the social licence to operate is growing for businesses, but interviews revealed that farmers may not fully grasp its significance or understand that it extends beyond government regulations. There seems to be a missed opportunity to educate farmers

about the importance of obtaining and maintaining a social licence to operate, both within New Zealand and on a global scale.

The concept of a social licence to operate refers to the acceptance of an industry by society at large. To have their products on the shelves, suppliers must adhere to the standards set by non-governmental organizations such as supermarkets or potentially milk processors. A recent example in New Zealand is the egg supply shortage. In 2012, the government committed to transitioning to a cage-free egg industry by 2022, eliminating battery cages but allowing colony cages or free-range farms. However, Countdown and Foodstuffs, as announced in multiple media releases, took it a step further by committing to source only from free-range or barn-raised farms by 2025 (Uys, 2023).

They were responding to evolving consumer preferences and meeting societal expectations that went beyond regulatory requirements. This example holds lessons for dairy farmers, as there is an increasing focus on sustainable products that align with environmental and social expectations. Interviews with milk processors suggested a similar approach to implementing standards for dairy farmers on GHG emissions that were above the regulations at a governmental level.

Profit (Economic Sustainability): Economic sustainability focuses on finance, profitability, and long-term viability. Interviews suggest that this section of the framework has been poorly communicated to the farmers, yet the interviews also suggested that this is the reason to act or the “WHY”, which will resonate most with the farmers. It directly influences their economic viability since farming is fundamentally a business. It is crucial to comprehend the financial consequences of not implementing measures to reduce greenhouse gas emissions and how this can ultimately impact the export of their products.

Reducing greenhouse gas emissions is vital for maintaining global trade. In a recent communication between New Zealand and the EU around a free trade agreement, a total of 24 questions were asked in terms of free trade, 19 of which were climate change-related (memorandum, Vitalis, personal. communication. May 17, 2023). This emphasises the importance of climate change when negotiating free trade agreements which encompass more than just agricultural trade. It is vital for New Zealand to secure free trade agreements for export potential, economic growth, continued market access and to strengthen diplomatic relationships. Not only does New Zealand need to have a good narrative around why we are world-leading in our milk production, but we also need credible evidence showing our contributions to climate change and reducing greenhouse gas emissions. We can no longer claim we are world-leading dairy producers without having the evidence to back it up.

Planet (Environmental Sustainability): Based on interviews and the literature review it became evident that the planet or the environmental portion of sustainability has been over-represented in communications with farmers. It is understandable that businesses are expected to be environmentally responsible and work towards mitigating climate change. This involves reducing carbon emissions, conserving resources, managing waste, and protecting biodiversity. But it is one aspect of a balanced farming system.

The literature review conducted by AgFirst in 2018 provided evidence supporting the concern that discussions surrounding sustainability, particularly within the media and environmental groups, tend to exclusively prioritise environmental factors, often overlooking the interplay with economic aspects.

Resources available online suggest that farmers need to reduce greenhouse gas emissions to save the planet and slow the effects of climate change. An example below from New Zealand Agricultural Greenhouse Gas Research Centre (NZAGRC), July 2022.

“Why Climate change matters: Earth’s atmosphere is heating up, associated with increasing concentrations of greenhouse gases. Significant changes to the climate are affecting our natural environment, primary sector, infrastructure and built environment, as well as human health”

The emphasis on saving the environment to stop climate change does not align with the beliefs farmers hold regarding climate change. Interviews suggested farmers perceive climate change as inevitable, regardless of New Zealand’s contribution to global warming. Additionally, New Zealand dairy farmers strongly believe that they are already doing an exemplary job in environmental stewardship. Consequently, the existing narrative fails to provide a compelling reason for New Zealand dairy farmers to modify their practices. The question arises: “WHY” should they change if it will not halt the effects of climate change?

The literature reflects the importance of aligning the values and beliefs of people to the message they are receiving. For example, the diffusion of innovations theory (Rogers, 2003) is a process or method that explores how new ideas, innovations, or products spread and are adopted within a social system over time. The theory emphasises the importance of communication channels, social networks, and individual characteristics in the adoption process. For individuals, it specifically touches on the importance of compatibility with the values, beliefs, and past experiences of individuals in the social system.

Using environmental concerns as a reason for change resonates with the core beliefs of farmers because they prioritise the environment, but they perceive themselves as already doing everything within their current capability in this space. As a result, they consider it an ineffective motivator for driving further change.

9 CONCLUSIONS

The purpose of this study was to find a way to motivate New Zealand dairy farmers to develop a positive desire to explore strategies for reducing greenhouse gas emissions on farms to ensure the long-term sustainability of farming in New Zealand.

Simon Sinek’s Golden Circle theory was used to categorise the semi-structured interviews into “WHY, HOW and WHAT” to understand the depth of motivation farmers have around climate change and reducing greenhouse gas emissions.

We need to learn to start with the “WHY” to drive meaningful change. Motivation stems from intrinsic values and a sense of purpose, which serve as the driving force behind actions. Interviews indicate that farmers already have intrinsic values and a sense of purpose, leaders need to find a way to tap into this when communicating the “WHY”. By staying connected to our core values and the underlying reasons for our actions, we can be inspired to make the necessary changes in both “WHAT” we do and “HOW” we do it, while remaining aligned to our core values.

To motivate New Zealand dairy farmers to uptake practices that reduce greenhouse gas emissions, it is crucial to communicate the following key aspects:

1. The economic benefit of reducing GHG emissions.

2. The need for obtaining a social licence to operate within New Zealand and globally.
3. "WHY" we farm. The reasons behind our unique farming methods.

Key findings:

- New Zealand dairy farmers have made changes in the environmental aspect of sustainability because this element has been effectively communicated to them.
- Insufficient communication on the economic and social aspects of sustainability has resulted in a lack of motivation among New Zealand dairy farmers to embrace change due to a limited understanding of its importance.
- The potential role of rural professionals and consultants as communication vectors is currently underutilised.
- Effective communication of the economic benefits through appropriate messengers can accelerate the adoption of sustainable practices among farmers.
- Farmers have a strong intrinsic focus to farm sustainably, this can be more effectively leveraged to motivate change.

10 RECOMMENDATIONS

- **Leverage the intrinsic values and purpose that farmers already possess.**

When developing GHG related communications to dairy farmers, industry partners should inspire farmers towards transformative change by building on farmers existing intrinsic values and encouraging mastery to drive toward continuous improvement.

- **Emphasise the importance of the economic benefits and social licence to operate.** Milk processors need to communicate to farmers and rural professionals the potential advantages of being market leaders in greenhouse gas emissions reduction and the consequences of falling behind.
- **Create a single source of information.** Ministry for the Environment should provide and manage a resource location (i.e. website) for reputable GHG related literature, policies, regulations and general resources related to climate change specifically for the dairy sector.
- **Provide GHG emissions resources for veterinarians:** New Zealand Veterinarian Association (NZVA) should curate a list of reputable sources of information regarding greenhouse gas emissions regulations, mitigation strategies, and the economic advantages of adopting practices that reduce GHG emissions. As a trusted source of information, veterinarians can disseminate this information to dairy farmers.

11 LIMITATIONS

- The interviews conducted only offer a partial representation of the New Zealand dairy industry population.
- While individual-specific barriers were not fully considered, the report emphasises the importance of addressing them and cultivating a mindset for overcoming obstacles.
- The focus of the report is on the underlying motivation that drives decision-making, rather than the intricacies of the decision-making process.
- Industry bodies were hesitant to share specific information on scope 3 emissions or be quoted in responses, limiting the depth of their contributions.
- The report does not include an analysis of mental well-being of individuals or populations.
- The voluntary nature of the interviews may have resulted in a bias towards innovators and early adopters, although efforts were made to involve a diverse range of participants.
- The interviews and literature review did not explore the cultural context of adoption of change.

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13 APPENDIX

Questions for Farmers:

1. Why did you choose a career in dairy farming?
2. In your opinion, what are the biggest challenges NZ dairy farmers face today?
3. Why do you consider these a challenge?
4. How do you feel about the greenhouse gas emissions regulations?
5. Which greenhouse gas regulations are of concern to you?
6. Why are these proposed regulations of concern?
7. How do you think legislation will impact your farming practices?
8. How do you stay up to date with new technologies or ideas around reducing greenhouse gas emissions on farms?
9. What are the trusted sources of information you use to get information regarding potential greenhouse gas regulations?
10. What practices have you adopted on the farm to reduce your greenhouse gas emissions?
11. Why did you choose to make changes on farm regarding greenhouse gas emissions?
12. What do you believe are the major barriers to New Zealand dairy farmers adopting practices that reduce greenhouse gas emissions?
13. What do you think the advantages are to NZ dairy farmers who adopt practices that reduce greenhouse gas emissions?
14. How do you think milk processors and dairy industry partners can encourage farmers to reduce greenhouse gas emissions on farm?
15. What role do you think NZ dairy farmers should play in reducing greenhouse gas emissions?
16. What role do you think industry partners should play in reducing greenhouse gas emissions?
17. How do you feel about the leadership industry partners are showing New Zealand dairy farmers during this period of change relating to GHG emissions?
18. If you could change something about the greenhouse gas regulations, what would it be?

Questions for Industry Partners:

1. In your opinion, what are the biggest challenges NZ dairy farmers face today?
2. Why do you think these are the biggest challenges NZ dairy farmers face?
3. How do you think farmers feel about the greenhouse gas emissions regulations?
4. What do you believe are the major barriers to dairy farmers adopting practices that reduce greenhouse gas emissions?
5. Why do you think dairy farmers might be reluctant to make changes on farm that reduce greenhouse gas emissions?
6. How do you communicate to farmers about greenhouse gas emissions regulations?
7. Why do you communicate with farmers in this way?
8. What group of farmers do you think your communications are reaching?
9. What group of farmers are you hoping to reach or educate with this communication style?
10. How do you think greenhouse gas emissions legislation will impact your company's practices?
11. How do you stay up to date with new technologies or ideas around reducing greenhouse gas emissions on farms?
12. What are the advantages to NZ dairy farmers who adopt practices that reduce greenhouse gas emissions?
13. How do you think these advantages could be highlighted to NZ dairy farmers?
14. In your opinion, how do you think your company/sector/business can encourage dairy farmers to reduce greenhouse gas emissions on farm?
15. In your opinion, how do you think we can speed up the uptake of reducing greenhouse gas emissions practices on farms?
16. What, if any incentives do you offer for NZ dairy farmers who are making changes to reduce greenhouse gas emissions?
17. What, if any penalties do you enforce for NZ dairy farmers who are not making changes to reduce greenhouse gas emissions?
18. What role should NZ dairy farmers play in reducing greenhouse gas emissions?
19. What role should industry (fertiliser, milk processor, veterinarians, genetics companies) play in helping farmers reduce greenhouse gas emissions?
20. If you could change something about the greenhouse gas regulations, what would it be?