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## Barriers to Diversification

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National Science Challenge

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**Authors**

**AgFirst**

Jeremy Hunt

Phil Journeaux

James Allen

**Farmer Partner**

Phil Weir

**AgResearch**

Tracy Nelson

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## 1.0 EXECUTIVE SUMMARY

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This report covers a project funded by Our Land and Water, to investigate the challenges faced by landowners when they seek to diversify via land use change. The project itself involved interactions with 11 farmers within the Waikato who were investigating various options for land use change on their properties. This involved three workshops with the participants where a range of issues were discussed:

- Options available.
- The need for good due diligence.
- Access to information, especially financial.
- The challenges and barriers participants came up against and how they approached these.

The four key motivations for diversifying were identified as (in order):

- Financial gain
- Desire to try something new
- Reduce environmental footprint
- Part of succession planning

Participants were asked to identify their top supporting partners in progressing their diversification plans. These changed throughout the project, with the top five identified at the end of the programme as (in order):

- Agribusiness consultants
- Supply/industry corporates
- Banks
- Other farmers
- Accountants

The key barriers identified to progressing diversification plans were (in order):

- Skills/human capital
- Physical limitations/resources
- Production uncertainty
- Set-up capital
- Lack of information

Participants were also asked to identify the main disadvantages they felt or experienced in endeavouring to diversify. These were identified as (in order):

- Time involved establishing a new enterprise

- Increased debt
- Pressure to run two or more operations

Overall, farmer participation in the workshops was motivated by a desire to seek information and support (expert advice). In essence, they wanted reassurance that they were on the right track or needed to/should be considering different pathways.

A clear message from the workshops is that diversification is multifaceted and complex. Several participants commented that there was a lot more to sorting through diversification options and implementing these, than originally anticipated.

Some workshop participants noted that they had changed their diversification plans over the course of the workshops, suggesting that the events had sparked new thinking around diversification. By the final workshop, most had either changed their ideas, or delayed implementation.

A key message from the workshops was the need for farmers to have good information around the financials (economic analyses) of different diversification options. Farmers wanted reassurance that their investment in one or more new land uses was a sound proposition, and they wanted to be able to compare options. In the absence of economic analysis, connecting with others – including consultants and experts – was seen as valuable, especially if everyone is in the same room at the same time.

Initially, participants had anticipated that access to capital would be a significant barrier, but this changed through the programme, with them identifying physical limitations/resources and production uncertainty as more significant towards the end. Expanding on this, there was a lot of discussion around the challenges faced looking to access water. Participants noted frustration around:

- Accessing information on water resources, and Council regulations.
- Costs for investigation and risk of not finding quantities required.
- The time involvement and cost in obtaining consents.
- Abundance of surface water on their farms with high flows during off-peak periods, but the constraints in harvesting and storing this for summer use.

A key question that perhaps needs to be asked and solved is:

- What is the environmental offset impact of accessing water in an allocated catchment versus reducing on farm contaminants (nutrients and GHG)?

A further key barrier to land use change identified was government policy and regulations, both at a central and local level, particularly: water policy, health and safety and subdivision rules.

Some key recommendations from the study are:

- More in-depth analysis of farmers diversifying in a specific region, focusing on both the farmers and their support network;
- Case study approach - focus in on one diversification pathway/option (e.g. dairy cows to dairy sheep or adding kiwifruit to a dairy platform) tracking farmers experiences as they progress towards implementation;
- Develop up Fact Sheets on information useful when considering land use change/diversification; and
- Review government policies and regulations that inhibit land use change, particularly those that result in lower environmental footprints.
- The following are considerations that need to be addressed at a regional and national scale:
  - How can we make land use diversification more appealing?
  - What are the steps that can be put in place to enable change to happen?
  - How can we support the industry to provide better information?
  - If access to water is such an issue, how can this be overcome?
  - The easier alternative to diversification is subdivisions/housing/lifestyle blocks.

## 2.0 BACKGROUND

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AgFirst was successful in obtaining funding from the New Zealand Institute of Primary Industry Management (NZIPIM) and the National Science Challenge (NSC) Our Land and Water (OLW) to undertake a Waikato-based study that seeks to understand the challenges a landowner will need to overcome to unlock alternative land use options on their land<sup>1</sup>. The focus was on future landscapes. AgResearch was engaged as the challenge party with a role to observe and document the social parameters that farmers faced when considering land use change. Phillip Weir was the partner farmer for this project. Phil, who is chair of themed-northern Beef + Lamb NZ farmer council and a Nuffield scholar, is actively considering diversification and was relatively well advanced in his due diligence process. Phil provided practical farmer insights to the farmer participants.

The Challenge has identified that in order for land stewardship to improve, better information needs to be provided to individual landowners/managers. Some excellent knowledge, data and tools are available to help make decisions about land use, but there are also some big gaps. This research provides a snapshot into some of the barriers to land use diversification. It is hoped the report will contribute to a vision of identifying a much greater range of suitable land opportunities which may provide the opportunity for a greater diversity of benefits for the New Zealand primary industry sectors.

The project builds upon work completed in 2019 funded by the Waikato Regional Council, which profiled a range of options which might be available for farmers in the Waikato<sup>2</sup>. This work profiled diversification of Waikato sheep and beef and dairy farms into maize, apples, kiwifruit, lucerne, dairy goats, dairy sheep, chestnuts and forestry. An assessment compared these alternative land uses to modelled dairy and dry stock (sheep, beef and deer) systems based on information presented in the AgFirst Farm Monitoring reports. The work considered the economic, risk, human capital and financial implications of the proposed land use change while ensuring that the developed land use would have a positive environmental impact.

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<sup>1</sup> For more information on the fund see <https://ourlandandwater.nz/get-involved/rural-profund-2020/>.

<sup>2</sup> This report can be found here <https://www.agfirst.co.nz/article/2440/>.

### 3.0 PROJECT OBJECTIVES

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Now more than ever, farmers and growers are facing tighter regulations and pressure to reduce their environmental footprint from traditional dairy and sheep and beef operations. The current focus is on contaminants such as nitrogen (N), phosphorus (P), sediment, Escherichia coli (E. coli) and greenhouse gasses (GHG). Central government has identified land use change (amongst other strategies) as being a key tool to enable national targets to be met to reduce these contaminants.

The scope of the OLW project was developed to engage with farmers actively seeking or investigating alternative land uses. The project, at a pilot scale, aimed to understand the 'real world' challenges to changing land use change. The title reflects the project focus: *Facilitating Farmer Economic understanding of alternative land uses and the barriers to adaptation and land use change.*

The purpose from a farmer perspective was to increase economic understanding around the comparison of alternative land uses. AgFirst would facilitate and encourage a due diligence process that could enable an objective comparison of contrasting land uses ('apples and oranges'). On this basis there was a need throughout the project to raise financial literacy of the participants.

## 4.0 UNDERSTANDING THE DRIVERS AND CHALLENGES FOR DIVERSIFICATION

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The human race has always used and modified land to meet its material, social and cultural needs (Briassoulis, 2009), so the concept of land use change and diversification is not something new. The selected literature reviewed follows catalogues from some of the reasons why diversification occurs and what the drivers are.

Thorrold (2010) made the observation that land use is a visual, often emotive and economically critical part of New Zealand life, and that land use change is always occurring, although it is often a slow process (Kerr and Olssen, 2012; Stavins and Jaffe, 1990). Landowners are often placing consideration and value on the option to convert to an alternative land use at a later stage (Schatzki, 2003). The change is not always in a broad pattern across the whole country but regionally specific as new opportunities arise to use land, sunshine and water to attract the attention of farmers and investors. Thorrold (2010) noted that land use change and diversification can be explained by differences in the profitability and capital values of different land uses, influenced by resource limits including slope, soil types and irrigation availability, and that these changes reinforce the basic land valuation concept that land use will over time move to its best use.

Slope of land has a strong influence on this, with the most profitable use on flat land, and the least profitable use on steeper land, and these uses are at their most profitable on their relevant land use (e.g. dairy, arable and horticulture on flat land, forestry on steep land, and sheep and beef on intermediate land) (Todd and Kerr, 2009).

There are a range of factors which drive land use change which are listed below. All of these factors interact and influence each other (Journeaux et al 2017).

### 4.1 Biophysical Factors

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As noted above, slope or topography has a strong influence on land use. As expected therefore, there are a range of biophysical factors which will drive the opportunity for diversification and land use change.

These include the range of biophysical influences which can affect land used decisions:

- Soil type - free-draining or not, whether suitable for horticulture compared with pastoral agriculture, how deep is the topsoil, how fertile is it.
- Topography - how flat or steep the land is, the aspect of the land, how suitable for mechanised farming, how prone to erosion.
- Climate - how much rainfall, how windy, amount of sunshine hours, degree of seasonal variation, probability of out of season frosts, how hot or cold it is at different times of the year in absolute terms but also relative to other growing regions for various crops.
- Availability of water - is becoming an increasing factor limiting or enabling diversification. Water is required for animal consumption, industrial use, irrigation and to support ecosystem health, i.e. there is a requirement for water to remain at a certain level for the recreational and ecosystem servicing values. In addition to water quality there is a water quantity requirement.

Land can be categorised into a capability rating – Land Use Classification (LUC), which is based on the ability of the land to sustain long term productivity (Figure 1). The lower the class the more versatile the land, and vice versa.

Figure 1: Land Use Classification

LUC Class	Arable cropping suitability	Pastoral Grazing suitability	Production forestry	General Suitability
1	High ↓ Low	High ↓ Very Low	High ↓ Low	Multiple land use
2				
3				
4				
5	Unsuitable	Very Low	Low	Pastoral or forestry land
6				
7				
8	Unsuitable	Unsuitable	Unsuitable	Unsuitable

Source: Land Use Capability Survey Handbook – 3<sup>rd</sup> Edition (2009)

## 4.2 Economic Factors

The relative economics of a particular land use are a key driver or barrier to land use change or diversification. Even when large changes in economic profits occur, land use responses can be delayed and can be gradual (Kerr and Olssen, 2012). Dorner and Hyslop (2014), suggest a range of detail in terms of the decision-making process regarding the economics. Considerations of the expected costs of conversion (to an alternative land use) against the expected benefits; the value of delaying a decision given the costs and risks of the decision, i.e. there is a consideration to be made as to the value associated with first mover advantage; and the economic implications of the risk of conversion not paying off.

A report by The Catalyst Group (2014) exploring barriers to alternate land uses and crops identified barriers in the producer-to-market supply chain. These included knowledge on how to grow, store, process and transport new products was lacking. Additionally, a key challenge highlighted was in developing and accessing markets for alternative produce/products with the land use decision-maker not necessarily being able to influence this, or having the skills to do so. Dorner and Hyslop (2014) also identified distance to ports and supermarkets as a potential barrier.

A summary of the range of factors which are somewhat loosely defined around 'economic' include: (Journeaux et al, 2017)

- Profit - what are the costs and returns from particular land uses, particularly on a comparative basis, i.e. how will dairy heifer grazing compare to cropping for maize or to an intensive bull system?
- Capital - access to capital for both investment, development and seasonal finance. This can vary; at an aggregate level New Zealand is not short of capital, but at an individual level it varies widely and the willingness for farmers to enter into more complicated business arrangements can create or limit opportunity for growth.
- Markets - is there a market for whatever land use is envisioned, what is the proximity to the market?

- Infrastructure - whether there is infrastructure available to support the proposed land use – be it servicing firms, processing firms, marketing firms. If no infrastructure currently exists, what is the likelihood/speed of development? Infrastructure also relates to access to road transport and other transport infrastructure, e.g. airports, ports. Infrastructure can also involve 'landesque' factors such as availability/accessibility of irrigation and/or land drainage systems, and water supply networks.
- Access to information - availability of information/technical advice around the proposed land use change, i.e. is the industry mature in the sense that it has a levy body or similar where growers or producers have pooled resources to collectively support their farming activities.
- Access to (skilled) labour necessary to run the proposed new land use activity.
- Land tenure - if the landowner has secure property rights to the land, then the incentive to consider long-term land use decisions is enhanced. If land tenure is uncertain, then the incentive is to concentrate on short-term farming activities and forgo any longer-term options. This issue has added complexity in the case of Maori land where multiple ownership is common-place and land parcels are often fragmented.

### 4.3 Technological Factors

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This relates to understanding the current technology around a particular land use, and/or understanding how technology or farm system management knowledge is changing, which may allow for a land use change previously not thought possible. For example, the development of aerial top-dressing enabled significant fertility improvements on steep hill country, and significant increases in stock numbers on this land generating more economic hill country farms, which previously could only carry a low number of stock of particular classes.

Another example is the advent of artificial drainage and frost protection systems. Implementing these can mean improving the quality of the soil and/or combating a climatic condition such that crops can be grown in what was originally a less than ideal situation.

### 4.4 Individual Factors

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Individual factors or personal preference are strong drivers and barriers to land use change or diversification. Aspects that contribute to personal preference can include: age, education, experience, family circumstances, attitude to risk, access to capital, access to information, and attitude to change.

In the literature, Parks (1995) suggests that a barrier to land use change is in the human capital of the land management decision-maker, in that they may not have the skills to run a new type of farm. Land management decision-makers may have preferences which drive the current use (Dorner and Hyslop, 2014; Thorrold, 2010; Britton and Fenton, 2007). Along with this, there may be a status quo bias to keep the land in its current use (Dorner and Hyslop, 2014). Timar (2011) found that land in Māori tenure is managed less intensively than other privately-owned land, which may suggest a cultural barrier to, or driver of land use change. Overcoming these social barriers requires either a change in land management decision-making (e.g. via extension or education), or a change of the land management decision-maker (e.g. through succession or sale of the land).

These individual factors can result in high quality land suited to horticulture or intensive animal production (dairying) running a mixture of drystock enterprises simply because of a range of individual factors driven by personal preference. These are listed below:

- Age
- Already retired
- Change is not necessarily a way to optimise performance
- Current land use is very sustainable with minimal environmental impacts
- Don't want to change
- Environmental Regulation including Emissions Trading Scheme
- Everything works fine as is, "If it ain't broke, don't fix it"
- Farm is already set up - no change necessary
- Forest in place and growing
- Forest not ready for harvesting
- Fully utilised
- Happy as I am

Perhaps the key thing is that land use change is usually very much driven by individual decisions and peoples' responses to economic opportunities, as mediated by institutional factors. For example, the prevalence of the kiwifruit industry in the Bay of Plenty or dairy farming in Taranaki did not happen because New Zealand Inc. thought it was a good idea; it happened because individuals saw an opportunity and acted on it.

#### 4.5 Societal Factors

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Societal and human factors are key influencers in land use decisions, and thus there are also social barriers to land use change which have been identified in the literature. Agriculture has always operated within a 'social licence to farm' context, which is becoming more prevalent and defined as societal pressures are increasing, as evidenced by concerns around animal welfare and environmental impacts of land use. This is being reflected in regulation, which has a direct potential to affect both land use and land use change.

This potential can act in one of two ways: regulations around discharges (e.g. particulates, smell, agri-chemicals, nutrients, greenhouse gases) could restrict or promote land use change, and other regulatory/incentive frameworks (i.e. taxation, subsidies) can also influence land use change. This was the case with the 'One Billion Trees' programme where the New Zealand Government has set the goal of planting one billion trees by 2028. The goal was supported by a \$120 million allocation in the budget which includes incentives for forest planting.

Societal factors also include wider driving forces such as population change and the demand for land for urban settlement. Additionally, changes in food preferences may result in demand for 'new' or alternative food products such as the global megatrend towards plant-based diets and the advent of plant proteins as increasingly cost-effective competition for animal derived proteins.

## 4.6 Regulatory Factors

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Land use, and factors affecting land use change, are largely governed by the Resource Management Act (1991) and the implementation of this via local regulatory plans.

Broadly, Regional Council regulation tends to influence land use and land use change via 'indirect' environmental issues, such as water takes, odour, and especially via regulation of the discharge of contaminants to water as governed by the National Policy on Freshwater Management (MfE 2014) and updated via the Essential Freshwater Policy 2020.

District or city councils can more directly influence land use and land use change via control of activities, for example subdivision, earthworks, infrastructural development, and zoning.

There are a number of regulatory factors which can influence land use change<sup>3</sup>:

- Controls on amenity effects, e.g. dust, noise, odour, are generally more onerous the closer to the rural urban interface. So, districts that are closer to an urban population and/or have a perceived rural landscape tend to have stricter controls. Amenity controls tend to have a requirement of internalising effects within the property boundary, but can, in an attempt to providing certainty, often set a distance an activity can occur, from either the boundary or often a dwelling on neighbouring property, e.g. buildings housing animals.
- Intensive farming, e.g. poultry/pigs, generally have stricter rules when closer to the rural urban boundary due to potential and actual reverse sensitivity effects (noise, odour, dust etc.). Land uses like this come under increasing pressure especially where there is rapid urban expansion. The technologies and assessments required to mitigate the effects and the cost of compliance can have a significant impact.
- Building controls, e.g. size/scale/footprint/colour/reflectivity - territorial authorities that have such controls are often attempting to preserve a presumed rural landscape and a presumed pastoral and non-industrial type use. Clusters of wintering barns, implement sheds, feed-pads etc. will often have stricter controls, sometimes under the guise of protecting soil versatility.
- The influence of zoning rule changes, e.g. where previously rural land becomes rural residential/urban, can create boundary issues which can become land use change by creep. This is especially in relation to nuisance effects such as noise, dust, agrichemicals and odour. While generally managed by district councils, there is some overlap in that discharge of agrichemicals, fertiliser, and effluent are regional council matters.
- Opportunities for expanding a land use or creating a new land use may be limited by controls over things such as wetlands, indigenous biodiversity, and landscapes. The controls in such instances may not prevent land use change, but the application for consent and conditions that may be imposed on a granted consent could make the proposal uneconomic along with the risk/uncertainty of whether consent would be granted.
- Subdivision controls in rural areas are generally an attempt to protect rural land uses and prevent the 'carving up' of land. While this tends not to be an issue in preventing land use change, there could be a consideration for a farming/horticulture land use that does not require a large land area but needs to be in a rural area, and suitable land of a suitable size

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<sup>3</sup> Note: these all relate to Territorial Authority matters

is not available. An example here is that the kiwifruit industry in the Bay of Plenty would not exist if the subdivision of existing farms had not been permitted.

- There can be overlays relating to such issues as landscape or special ecological areas, which can influence land use decisions, e.g. outstanding landscapes often have restrictions around forestry specifically as a monoculture, and regulations around building height, size, colour etc.

## 5.0 METHODOLOGY

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The methodology employed for the project was:

- Recruit diverse farming operations that would have suitable land and appetite for understanding alternative land use options.
- Participants selected were either already involved in or genuinely interested in diversification options for their land.
- All farmers recruited were located in the Waikato, so it was possible for workshop attendance.
- Selected farmers undertook their own due diligence for a suitable land use change option.
- Three farmer workshops were facilitated to provide information on alternative land use options, due diligence requirements, economic analysis, risk criteria, as well as provide expert industry perspectives.
- Survey the participants at the close of each workshop to understand some of the key drivers and barriers to land use change.
- Phil Weir as the partner farmer hosted the second workshop. Phil had largely completed a due diligence process and was involved in the report commissioned by the Waikato Regional Council previously. He brought a number of relationships to the table which formed the basis of the content for Workshop 2 and was able to refer other participants to people for information outside of the project which was useful for a number of parties in keeping their due diligence progressing.

### 5.1 Workshop 1

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Workshop one started with an introduction of the participants, the purpose of the project, and their ideas of potential land use change they were/could investigate. This was followed by:

- A presentation on the work carried out to date was provided by AgFirst
- Introduce the participant farmers with an action plan involving appropriate due diligence tasks. Participants were provided with a checklist of activities for due diligence.
- A presentation on the economic, risk, environmental and human capital issues to consider when looking at land use change, covering:
  - What are the objectives for making the change?
  - Who are the stakeholders – who makes the decision?
  - Financial capacity to make the change – access to capital
  - Attitude to risk
  - What is considered intensification and are there any environmental or regulatory issues to consider?
  - Skills to make it work – do you have them/can you buy them in?
  - Labour – can you access it, can you manage it?
  - Value chain – does one exist, where do you fit into it.
  - What are the drivers for your change?

- What are the alternatives?
- What assets do you bring to the change?
- The need for good financial analysis

This was discussed in conjunction with the survey questionnaire the participants were asked to fill in (refer Appendix 1) and the need to do good due diligence, as per the list in Appendix 2.

## 5.2 Workshop 2

This workshop was 2.5 months after the first, and held at the partner farmers' woolshed (see Figure 2), with discussions on:

- Host farmer discussing his due diligence programme to date (setting up kiwifruit block on a sheep and beef farm), and priorities around business and family life.
- Discussion by an invited local farmer on his establishment of an avocado block (3 hectares) on his dairy farm covering:
  - Reason for diversifying into avocados
  - Process whereby the orchard was developed
  - Issues encountered/overcome
  - Noted that diversification options must be synergetic and not overly complicate lifestyle
- General discussion by participating farmers as to where they were at with their diversification programmes, and issues they had run into.
- Presentations from four experts/industry people:
  - Eastpack (Kiwifruit packhouse) – economics and requirements of kiwifruit
  - Maui milk – an introduction to sheep milking and a financial overview
  - Hydrologist – overview of water issues/regulations in the Waikato, particularly with respect to taking water for irrigation
  - AgFirst – greenhouse gas issues/carbon farming

Figure 2: Second Workshop



### 5.3 Workshop 3

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This was held 2.5 months after the second workshop, and covered:

- A summary of the project to date.
- A review of the Due Diligence list, and where participants were at – what barriers had they faced/overcome, had they changed their minds on anything?
- A presentation from Fruition Horticulture around land use change into horticulture, and the issues therein.
- A discussion of where to next – having been through the project, what were the participants feelings on their next steps and is there enough support to help them progress?

## 6.0 RESULTS

### 6.1 Participants

Workshop participants had a diverse range of current enterprises, ranging from dairy, sheep and beef through to lifestyle enterprises (Table 1). Four of the 11 respondents were already farming multi enterprises, either a combination of dairy and dairy support or dairy support and sheep and beef. Due to the number of participants, there is insufficient data to identify quantitative trends in participant responses between workshops. However, qualitative themes are explored with supported information and observations from the workshops.

Table 1: Participant farmers existing enterprises

Participant #	Existing Enterprise	Total size (ha)
1	Dairy Dairy support Māori lease	193
2	Dairy support Sheep and beef	270
3	Dairy Dairy support Lifestyle	165
4	Dairy support Sheep and beef	240
5	Dairy	180
6	Dairy	501
7	Dairy	141
8	Lifestyle	27
9	Sheep and beef	1020
10	Sheep and beef	16
11	Sheep and beef	225

The age of the participants and their relative financial position may have had a role to play in both the desire to explore diversification but also the financial capacity to execute it.

Through discussion with participants, it became apparent that consideration of diversification may be focused on more by younger farmers as a due diligence exercise, but not actually implemented, due in part to often needing to navigate a succession arrangement with family, i.e. directing capital into the purchase of land or stock. The level of capital gain over the last 20 years has placed pressure on these processes which may result in diversification not being executed.

In any future work it could be useful to uncover the financial position of participants to understand the degree to which this may or may not be a constraint.

### 6.2 Diversification Options

At the beginning of the project, the participants were asked to list their preferred diversification options. There was a large range of potential options that were first considered by the participants for their farming enterprises. Dairy sheep and vegetable production were popular choices, along with kiwifruit, other horticulture (nut trees, citrus, and 'anything') and

‘other’ enterprises (forestry, raw milk, meat processing, honey, nursery, native trees and carbon). One participant with a large number of titles also had a vision of diversifying into a range of alternative cropping and horticultural operations. A summary of the diversification options considered is presented in Table 2.

The majority of participants were considering a combination of diversification enterprises. Examples of combinations mentioned included ‘kiwifruit and dairy sheep’, ‘dairy sheep and blueberries’ and ‘kiwifruit and vegetable production’.

Table 2: Diversification options considered

Land use change considered	Number of respondents
Dairy Sheep	✓✓✓✓
Vegetable production	✓✓✓✓
Maize	✓✓
Blueberries	✓✓
Kiwifruit	✓✓✓
Dairy Goat	✓
Other Horticulture	✓✓✓✓
Other	✓✓✓✓✓✓✓✓

Over the course of the project, it was identified that the participants were frequently changing their minds, with 80% considering a different option compared to their preferred initial diversification choices. The reasons were cited as “a change of circumstances”, “income – wanted more \$ returns” and “lack of information regarding costs/profits”. A consideration that one of the participants had was to invest and optimise their existing enterprise by looking at irrigation for their dairy farm. All of the final workshop participants indicated that there were suitable diversification options available for their specific land type. This notwithstanding, it was uncertain as to whether or not the participants were going to undertake a diversification activity within the next 12 or 24 months. For many, despite due diligence being undertaken, there was significant uncertainty as to the real profits of the alternative land use and not enough conviction of the alternative to make a leap of faith. Therefore, it may prove that the economic constraints means that change is not made.

By way of an example, one participant made significant progress with due diligence for kiwifruit with the plan to enter into a joint venture for a 10-canopy hectare development. In the period of this project the participant spent \$100,000 to drill for water, whilst only finding water in volumes that would enable a 4 to 5 hectare development. Coupled with this lack of water, the licence price for Sungold increased by 25% from the previous year, making the economics of a development largely funded through bank debt even more marginal. Whilst this development is not terminated, the participant commented that they need to go back to the drawing board around what a development might look like and basically what the best use might be for this water resource on a dry stock property which has land class suitable for dairy, horticulture or cropping.

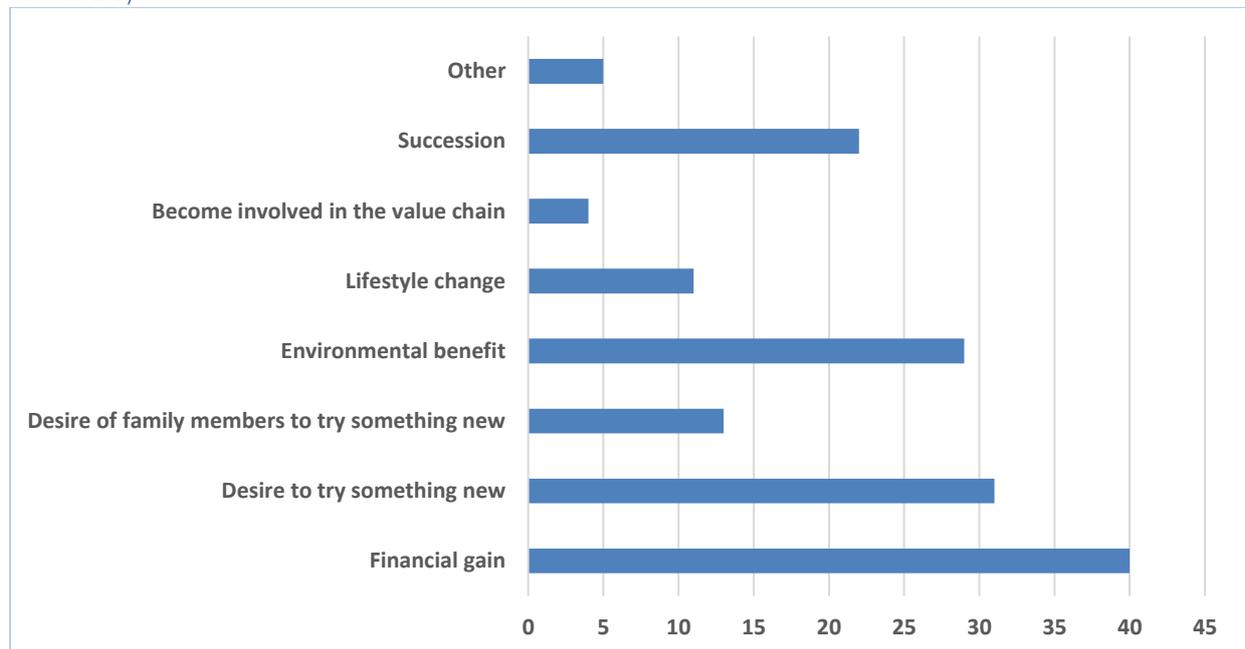
The costs of this exploration work needs to be considered against the relative profitability of existing enterprises. The availability of free cash from the existing enterprise to put towards aspects such as due diligence on a diversification option, needs to be weighed up against other

opportunities for the use of such free cash such a debt reduction, farm development or personal spending.

### 6.3 Motivations for Diversification

To understand what was driving the desire to diversify their farming enterprise, participants were asked to identify their top five motivations for wanting to change (Figure 3). Financial gain was the most important motivation, followed by the desire to try something new. It is important to consider that there will be multiple motivations for considering diversification and many of these top motivations may be of equal importance, so when looking at the top three motivations, financial gain, environmental benefit and desire to try something new were the most mentioned.

Figure 3: Motivations for Diversification (aggregated weighting applied depending on whether the motivation ranked 1-5)



### 6.4 Making the Change

At the beginning of the project, participants were asked to rate their knowledge of their proposed change on a scale of 1-5, with 1 being 'very little' and 5 'quite a lot'. There was a range of knowledge levels expressed, with only one participant rating their knowledge as 'quite a lot'. This is consistent with participants' desire for information and connecting with other farmers as a key motivation for attending the workshops. It was gauged that the participants understanding in their diversification options throughout the project was increasing, with only one participant signalling only a small increase in knowledge.

Table 3 illustrates where participants had gained their current knowledge from. Consultants were the most mentioned source of information, followed by media, other farmers and farm open days. Participants typically relied on information from multiple sources.

Table 3: Source’s participants have gained their knowledge from

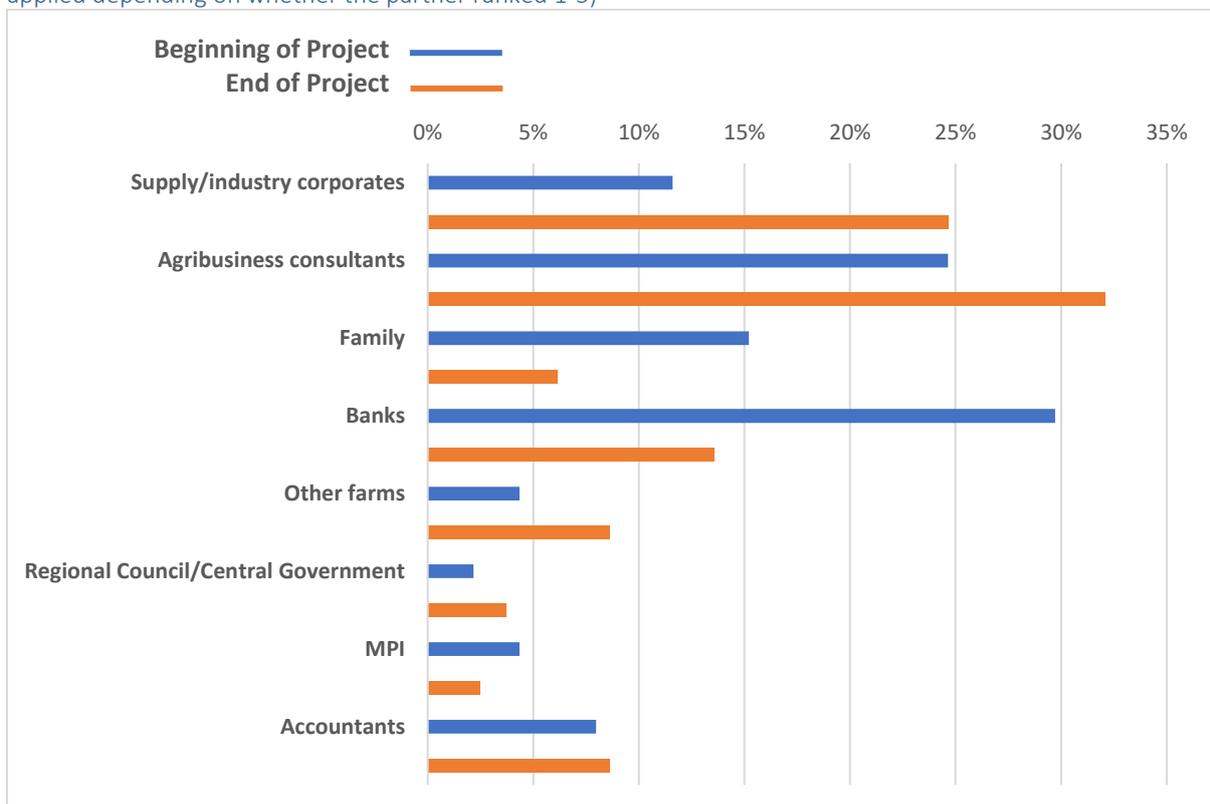
Source	Number of responses
Consultants	✓✓✓✓✓✓✓
Media	✓✓✓✓✓
Other farmers	✓✓✓✓
Farm Open Days	✓✓✓✓
Industry	✓✓✓
Other	✓

### 6.5 Supporting partners

During the Workshops participants were asked to identify who they value as being their top five supporting partners in regard to progressing their diversification plan. Using an aggregated total, agribusiness consultants were considered the first choice supporting partner followed by banks and supply/industry corporates. Family, accountants and other farms were also seen as being important. Figure 4 presents a graph comparing the results of preferred supporting partners at the beginning of the project and the end of the project. As the participants continue to explore their preferred land use, it appears that who they view as key support will change.

It is considered natural that the initial thought about supporting partners could see the banks having the greatest importance at the start of the project or due diligence process. In effect the banks are being seen as a coverall for finance and therefore if it is not possible to obtain finance the project is dead. What became apparent, is that while this is true, access to capital is not the principal constraint and rather access to cross sector information is.

Figure 4: Primary supporting partners for participants throughout the project (aggregated percentage weighting applied depending on whether the partner ranked 1-5)



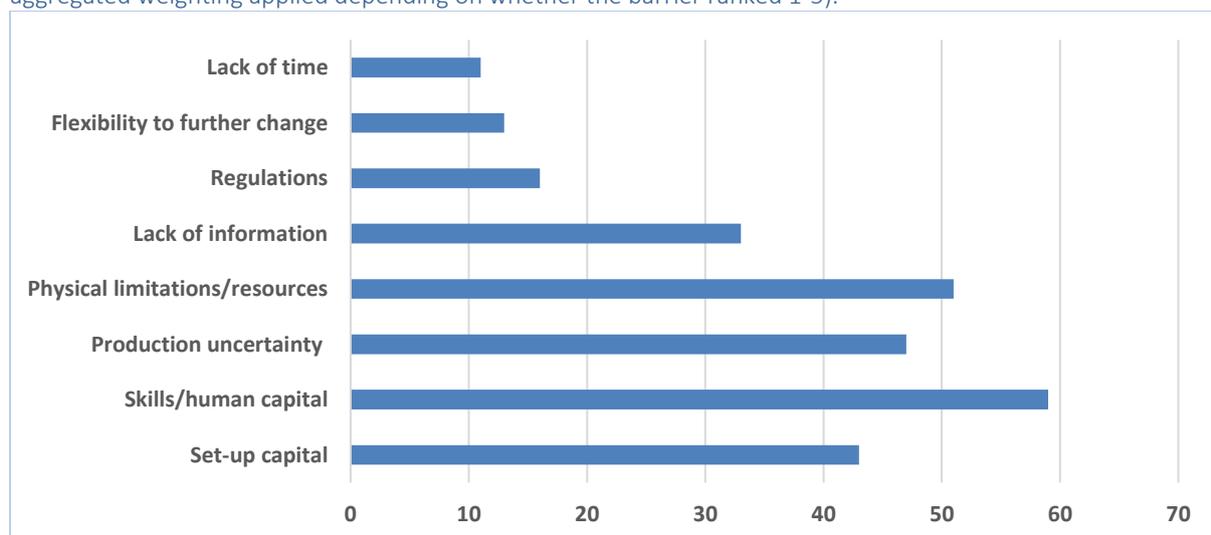
## 6.6 Barriers to Diversification

The key barrier participants anticipated facing or had encountered when diversifying their business was skills/human capital, followed by physical limitations/resources, production uncertainty, set-up capital and lack of information. It is important to consider that there will be multiple anticipated barriers when considering diversification and many of these top barriers may be of equal importance. The responses to barriers identified are presented in Figure 5. Following discussion around how these barriers were perceived, it was identified that the key driver behind physical limitation/resources was water security and availability.

In reflecting upon this result it maybe should not come as a surprise that water availability was considered the greatest constraint. The study area in the Waikato is one which for pastoral land uses has long been considered summer safe and as centre pivots expanded around New Zealand the need for this infrastructure to support dairying or drystock pastoral within the Waikato has been limited. The challenge then is that farmers in the Waikato are generally only familiar with dealing in volumes of water for stock use that can be readily found from surface features or small bores and is typically low in volume.

When looking at kiwifruit or other fruit crops, the demand is significant and despite the soils being of high quality and able to grow most crops, the absence of water will ultimately be the restriction. Therefore, from an environmental perspective there could be a requirement to assess the externalities associated with increased water storage and reduced flows versus nutrient and contaminant losses (including GHG). Practically, there will need to be an easier way to obtain and store water if the economy wants to transition to lower impacting methane and water pollutant activities. Put simply, enabling horticulture on our best soils at the expense of dairy farming, or for that, point the sale of sections for residential housing.

Figure 5: Key barriers participants identified for progressing their diversification plan (From combined surveys - aggregated weighting applied depending on whether the barrier ranked 1-5).



To further understand how the participants would look to overcome these barriers, the following points were made:

- » *“work in progress”*
- » *“we are still looking for more information in regard to actual production”*

- » *“persistence, ringing people over and over again”*
- » *Building relationships with providers “looking to free up some time to spend with the family while they are young, which diversifying may not help with”*

When asked if there has been enough information available in regard to their diversification option to make an informed decision, it was split between ‘yes’ and ‘somewhat’. Most of the participants responded through the surveys that participating in the workshops helped them progress their diversification plan, although this did not mean that they were actually going to diversify.

Participants were asked to identify the disadvantages they felt existed to diversifying, in which they were not limited to only choosing one option. The majority of participants saw the time involved establishing a new enterprise, increased debt and pressure to run two or more operations as the key disadvantages to diversification. The response from the participants is presented in Figure 6.

Figure 6: Perceived disadvantages participants felt existed as a result of diversifying



## 6.7 Next Steps

At Workshop 3 participants were asked what support would be useful to help progress their diversification plan. Comments included:

- » *“setting goals and timeframes to discuss progress”*
- » *“meeting and talking to people already involved in the industry”*
- » *“direction to best land use, direction to easiest path to that land use”*
- » *“access to capital”*
- » *“faster action by Council staff”*
- » *“further data around the production potential of the milking sheep, which should become more available as the season progresses”*

## 7.0 DISCUSSION

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### 7.1 General

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At Workshop 1 it was clear that all farmer participants had at least some idea of the diversification option(s) they could incorporate into their business. It was evident, however, that they were all at different stages in their diversification planning journeys. It is important to note here that all workshop participants were highly motivated and had done a lot of background research on land use change and diversification before attending the workshop series.

Some of them were at the early information gathering stage, motivated by a desire (and need) to expand their knowledge base before committing to on farm change or considering options. They were mainly interested in gaining information about the *right option for their business*. Others, who were a little more along the diversification pathway, were seeking more *specific* information with regard to the specific options they were canvassing.

Overall, farmer participation in the workshops was motivated by a desire to seek information and support (expert advice) – in essence they wanted reassurance that they were on the right track or needed to or should be considering different pathways.

No matter where in their diversification journey participants were, they all found aspects of the workshops (1, 2 and 3) useful. The due diligence checklist was, for the majority of participants, described as being very useful. The checklist helped provide practical information (i.e. guidance about who they needed to talk to and the key steps in the process). The checklist was seen as a very helpful tool for thinking through diversification and also assisted in building their confidence for it.

A clear message from the workshops is that diversification is multifaceted and complex. One participant noted that the workshop made them realise that “there are a lot of questions I need answers to before progressing.” This farmer was not alone: getting answers to these questions was a key reason for attending the workshops (registered in the top four motivations). As one participant noted “it’s more complicated the more you know” and another, “the more you know the less you know”.

Some workshop participants noted that they had changed their diversification plans over the course of the workshops, suggesting that the events had sparked new thinking around diversification. By the final workshop, four of the five participants had either changed their plan or delayed it, with only one sticking to their original diversification strategy. It is possible that the workshops highlighted the need for taking time to do due diligence and not to assume land use change is simple or risk free.

Consultants were identified as a particularly important source of information, and also as a supporting partner for farmers. Media sources and ‘other farmers’ were also viewed as harbourers of good information and advice. Consistent with recent work on farm entrepreneurship, this suggests that it is important for farmers to form a trusted support network around their diversification thinking. Nelson and Mackay’s (2019) study on farmers considering new options emphasised the importance of reliable networks of support, with other successful rural entrepreneurs “to whom they could turn for information, encouragement and advice” (p.179). Nelson and Mackay (2019) also noted that a key challenge

for entrepreneurial farmers was the “need to navigate new and often unfamiliar rules and regulations during the start-up phase of a new venture” (p.179). The project as much as practical, sought to leverage off both the partner farmer and others who were further along their due diligence journey. Although finding a match for individuals was difficult as many participants had shifting goal post around what diversification would look like.

A key message from the workshops was the need for farmers to have good information around the financials (economic analyses) of different diversification pathways and options. Farmers wanted reassurance that their investment in one or more new land uses was a sound proposition. The workshop data suggests that they wanted to be able to compare options. In the absence of economic analysis, connecting with others – including consultants and experts – was seen as valuable, especially if everyone is in the same room at the same time. It was not apparent that participants wanted support with integrated financial planning and budgeting, although the partner farmer noted that support for more unique industries could be an area of value add for supporting experts.

The workshops sought to uncover some of the perceived challenges and barriers to developing and implementing a farm diversification plan/strategy. As reflected above, the main challenge was the perceived lack of information (e.g. “lack of enough information to progress at this stage”) and a need for specialist (but difficult to find) advice at times. Workshop 1 participants, for example, wanted to hear more from water and dairy sheep experts at subsequent workshops in order to dive more deeply into specific land uses.

Again, the lack of clear data around the financials of diversification emerged as a challenge for progressing farmers’ land use change aspirations. This included a lack of knowledge around initial investment costs and ongoing expenses, labour, debt management, and projected profits. A further concern for farmers was the lack of information around the compatibility of a new enterprise with their existing farm business, not only in terms of the farm system but also with respect to the amount of management time each enterprise would demand (also noted by Nelson and Mackay, 2019, in earlier work on farm entrepreneurship who noted farmers felt time poor even at the best of times).

As discussed in Section 5, all of the participants prior to the project were either already considering alternative land uses or were genuinely interested in the process. Therefore, it was surprising that by the end of the project, despite all of the participants identifying that there were suitable options available for their land, that for the most part, there was uncertainty whether they would progress with their proposed land use change – particularly in the next 12 - 18 months. When discussing the ‘where to now’ at Workshop 3, one of the participants stated that after considerable due diligence *“there is no silver bullet, information is too hard to come by and the most certainty I will get for financial gain will be to sell my individual titles as large lifestyle blocks”*. This unfortunately is the reality of the pressures faced, and more and more we are seeing high class land being lost from productive agricultural land into housing and lifestyle units.

At the start of the workshop series participants anticipated that set-up capital would be a key barrier to progressing their diversification plan. By Workshops 2 and 3 participants did not see set-up capital as such a large barrier to progressing their diversification plan. Instead, the key barriers to progressing their plans were now seen as physical limitations/resources and production uncertainty.

## 7.2 Barriers

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As discussed above, the participants in this project all encountered a range of barriers as outlined in Section 4.

The barrier that was discussed the most, by far, during the workshops was water availability for irrigation. There were a number of participants that were working through various stages of their due diligence for obtaining water for irrigation. Only one of the participants had progressed to an investigation stage, with the others stalling and often second guessing their diversification options because of uncertainty and difficulty around this topic.

Land use change into horticulture in most regions of New Zealand will require significant quantities of water for irrigation, and to a lesser extent, potentially for frost protection. Participants noted frustration around:

- Accessing information on water resources, and council regulations.
- Costs for investigation and risk of not finding quantities required.
- The time involvement and cost in obtaining consents.
- Abundance of surface water on their farms with high flows during off-peak periods, but the constraints in harvesting and storing this for summer use. A number of participants noted that council advise groundwater as being the appropriate course to take because of the difficulty from a regulatory perspective in economically utilising surplus surface water. This approach means land use change is restricted because the 'prospecting' for ground water is costly and uncertain at the volumes required for irrigation.
- Certainly given the relatively high rainfall in the Waikato catchment water storage for irrigation could be relatively efficient and creating the policy settings to support this activity is considered a key enabler of this report to enabling land use change resulting in lower nutrient and greenhouse gas losses.

A key question that perhaps needs to be asked and solved is:

- What is the environmental offset impact of accessing water in an allocated catchment versus reducing on farm contaminants (nutrients and GHG)?

A notable component of barriers relate to Government Policy – both central and local. In addition to the water resources discussed above, a selection of these are:

- Health and Safety. Again the main frustration was in obtaining information on what health and safety regulations they would need to follow, and how this may alter depending on the diversification option being investigated.
- Subdivision. The main issue here was (again) the time and cost involved in obtaining a consent.
- HASNO. The point was made that it is very difficult to find approved chemicals for small crops, often resulting in "off-label" use.

Other significant barriers that have been commented on include:

- Access to financial information. While there is some financial information available for the major industries, often these are the ones being diversified away from. Information on new crops is extremely rare and difficult to access. Often small growers are focused on the domestic market and are very reluctant to share information.
- Market outlook. In a similar vein, obtaining good information on potential markets, and how to access these, is again very scarce.

## 8.0 RECOMMENDATIONS

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1. The current scoping study involved only a small number of farmers. While this small group was very helpful for gathering baseline information (for subsequent testing and to inform future work), there is a strong need to involve more farmers from a wider range of settings to enable comparison across regions, catchments, and land uses. This need reflects the complexities that became evident in the workshops around different diversification pathways, options, concerns, and individual journeys. Aside from proposing a national diversification survey and roadshow (expert workshops across the country), two further options would be to:
  - (a) Look at farmers diversifying in a specific region, focusing not only on farmers and their activities, but also the support network in that region, asking the question: do farmers have access to the information they need in a regional setting, and if not, what could be done to improve the situation? This particular approach could take the form of a regional workshop series.
  - (b) Focus in on one diversification pathway/option (e.g. dairy sheep) tracking farmers experiences as they progress towards implementation. This option would provide an exemplar of farmers' information needs and sector-specific barriers. To track the farmers' diversification journey an interview approach would work well (see Nelson and Mackay, 2019).
2. The workshops confirmed that information for farmers considering diversification is lacking. That said, the AgFirst Due Diligence Checklist was seen as a valuable resource because it helped guide diversification thinking (setting farmers on the right track). There is an opportunity to convert the checklist into Fact Sheets for farmers, containing more detailed information, either by way of the provision of general data or more targeted information for specific land uses (e.g. kiwi fruit conversion or sheep dairy). These fact sheets could take the form of free online resources for greater reach and impact.
3. It became evident in the workshops that consultants are important "knowledge brokers" and key "connectors" for farmers who are exploring diversification options (connecting them to the right information, people, experts, and support). There is an opportunity for consultants to advance the idea of connection by instigating mentoring systems and building local support networks, by linking local people who are on different stages of the same diversification pathway, including connecting farmers with industry players and vice versa. It could be that this connection is made to catchment groups which will grow in importance over time.
  - (a) Farmers have important information which they could share with other farmers considering a diversification option.
  - (b) As farmers progress to focus on specific options that is when they need support connecting to others who are or have made the change to that option. For farmers in the early stages of their diversification journey there may be benefit in connecting with a diverse range of farmers exploring different options.

4. Carry out a review of government and council policies and regulation. If the desire is to utilise land use change to lower environmental impacts, then regulatory impediments to this need to be reviewed. The following are considerations that were identified:
  - (a) How can we make land use diversification more appealing?
  - (b) What are the steps that can be put in place to enable change to happen?
  - (c) How can we support industry to provide better information?
  - (d) If access to water is such an issue, how can this be overcome?
  - (e) The alternative to diversification is subdivisions/housing/lifestyle blocks.

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## 10.0 APPENDIX 1: PARTICIPANT SURVEY

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1. Name: \_\_\_\_\_
2. Position / Job title: \_\_\_\_\_
3. Length of time farming: \_\_\_\_\_ years
4. Current land use

✓	Land Use	Area (ha)
	Dairy	
	Dairy support	
	Sheep and beef	
	Arable	
	Lifestyle	
	Other (please specify)	

5. Please identify your top motivations for wanting to diversify your farming business  
(Rank in order: 1 = top motivation)

	Desire to try something new
	Desire of family members to try something new
	Financial gain
	Environmental benefit
	Lifestyle change
	Become involved in the value chain
	Succession
	Other (please specify)

6. What land use change/s have you considered? Please include how many hectares you would convert if known.

✓	Land Use Change	Area (ha)
	Dairy sheep	
	Dairy goat	
	Maize	
	Other arable (specify)	
	Kiwifruit	
	Blueberry	
	Other Horticulture (specify)	
	Vegetable production (specify)	
	Other (specify)	

7. On a scale of 1-5 how would you rate your current knowledge of your proposed change?

Very Little				Quite a Lot
1	2	3	4	5

8. Where have you gained this knowledge from? (tick all that apply)

<input type="checkbox"/>	Consultants
<input type="checkbox"/>	Other farmers
<input type="checkbox"/>	Industry
<input type="checkbox"/>	Farm open days
<input type="checkbox"/>	Media (articles, social media, farming publications)
<input type="checkbox"/>	Other (please specify)

9. With your current knowledge, resources and skills do you feel confident to make the proposed change?

<b>Not at all confident</b>					<b>Highly confident</b>
1	2	3	4	5	

10. On a scale of 1-5 how motivated are you to diversify your farming business?

<b>Highly unmotivated</b>					<b>Highly motivated</b>
1	2	3	4	5	

11. What do you anticipate will be the key barriers you will face in diversifying?  
(Rank in order: 1 = most important)

<input type="checkbox"/>	Set-up capital
<input type="checkbox"/>	Production uncertainty
<input type="checkbox"/>	Skills/human capital
<input type="checkbox"/>	Physical limitations/resources (i.e. access to water)
<input type="checkbox"/>	Flexibility to further change (i.e. maize has high flexibility as very little set-up and obligations)
<input type="checkbox"/>	Lack of information
<input type="checkbox"/>	Regulations
<input type="checkbox"/>	Lack of time
<input type="checkbox"/>	Other (please specify)

12. What disadvantages do you think exist by diversifying your farming business?  
Please tick all that apply.

<input type="checkbox"/>	Increased debt
<input type="checkbox"/>	Time involved establishing a new enterprise
<input type="checkbox"/>	Increased risk to the wider business
<input type="checkbox"/>	Reliable access to market
<input type="checkbox"/>	Pressure to run two (or more) operations at the same time
<input type="checkbox"/>	Other (please specify)

13. How many months/years do you envisage before you start the change? \_\_\_\_\_

14. How many years do you envisage before the change is complete? \_\_\_\_\_

15. Who do you foresee as being your primary supporting partners?

(Rank in order: 1 = most support)

	Banks
	Accountants
	Agribusiness consultants
	Supply/industry corporates
	MPI
	Regional councils/central government
	Other farms
	Family
	Other (specify)

16. What is your main motivation for attending today's workshop?


17. What has been the biggest challenge you have faced progressing your diversification plan?


18. For your specific land type are there suitable diversification options available?

Yes	No

19. Has there been enough information available in regard to your diversification option to make an informed decision?

Yes	No	Somewhat

20. Has participating in this process helped you progress your diversification plan?

Yes	No	Somewhat

What are your first steps after today?	What was most useful from today's session?

What further information do you require?	What would you like covered at the next Workshop?

What are the next steps in progressing your diversification plan?	To continue progressing your diversification plan what support would be useful?

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Due Diligence Checklist

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1. **What do you want to achieve** by changing your land use?
  - What are the key drivers for the change?
    - (i) Financial
    - (ii) Lifestyle
    - (iii) Succession
    - (iv) Job satisfaction and enjoyment
    - (v) Environmental and regulation
    - (vi) Perception
  - Are you/your family going to be better off after the change?
    - (i) What does better off look like for you? Remember that it will not just be financial or lifestyle, it will likely be a balancing act of a range of the factors above.
    - (ii) When do you want 'better off' to occur? Short-term or long-term play?
2. **Can I optimise/simplify my existing operation** to achieve question one?
  - Talk to an advisor
  - Talk to farming friends
  - Field days/discussion groups
3. Are all your **shareholders/stakeholders on board** with the idea of diversification?
4. **What options are you looking at?** Draw up a list, reduce it down to most likely.
  - Document why you ruled an option out. It makes it easier to stop going around in circles on ideas.
5. **Information gathering** - where can I go to get information and advice on the preferred options I am looking at? Will there be ongoing support available?
  - Levy body
  - Websites
  - Advisors with a track record
  - Friends and Family
  - Neighbours and other farmers
  - Industry representatives and organisations
6. What **value chain** exists?
  - Is there an existing market?
  - Can I sell my product?
  - To whom?
  - How much would I need to develop/invest in the value chain?

7. Do you have the **biophysical resources** on your land?
  - What are the physical requirements for my preferred option?
  - Soil type - dig a few holes, check soil and LUC maps.
  - Climate - check NIWA records - rainfall, maximum/minimum temperatures, humidity.
  - Frost, particularly out of season, i.e. early or late. How does this compare to the rest of the Waikato?
  - Fog.
  - Water - do you need water for irrigation - can you access this?
    - (i) Determine how much water you need and when?
    - (ii) Most of the Waikato water is fully allocated.
    - (iii) Discuss with Waikato Regional Council or an advisor about the rules and regulations.
  
8. **Financial** - How much funding do you require?
  - Have you completed a budget and who can help you with this?
  - What are the development costs?
  - What sources of funds do you have - own, family, equity partnership, bank?
  - Is the option financially viable - what is the rate of return, payback period etc?
  - How do the options compare?
    - (i) With existing operation
    - (ii) With optimised existing operation
    - (iii) With each other
  
9. Have you talked to your **bank and/or other trusted advisor** (accountant or financial advisor)?
  
10. **How much risk** am I willing to accept? Do a risk assessment.
  - Flexibility to change
    - (i) How permanent is my preferred option, can I reverse out of it?
  - Water usage
    - (i) How reliant on irrigation is the preferred option?
  - Production certainty
    - (i) Are there existing operations within your region?
    - (ii) Is there robust production data available to use as a benchmark?
  - Labour
    - (i) How much labour is required?
    - (ii) How good am I at managing people?
    - (iii) Where will it come from?
  - Upskilling
    - (i) Do I have the skills to manage the proposed operation?
    - (ii) Where can I learn these skills?
    - (iii) What support is there for my proposed operation?

AgFirst Waikato (2016) Ltd  
26D Liverpool Street  
PO Box 9078, Hamilton 3240, New Zealand  
07 839 2683  
waikato@agfirst.co.nz  
www.agfirst.co.nz

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