



KELLOGG
RURAL LEADERSHIP
PROGRAMME



Big Potential. Small Blocks:

A concept to unlock the production potential held in New Zealand Lifestyle Blocks

Kellogg Rural Leadership Programme

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1. Executive Summary

The focus area for this report comprises of 32,000ha surrounding Pukekohe. 13,000ha of which is made up of blocks between 1 – 20ha in size.

How can small blocks be utilized for production without sacrificing lifestyle?

To address this topic, a literature review and a survey were conducted to understand the characteristics of New Zealand small holdings, pressures; land and social and the motivations to production v lifestyle. The key findings are summarized below:

- Small blocks occupy 10% of New Zealand's versatile growing land.
- Owners value rural living, peace and quiet, privacy and a place to raise a family.
- Small blocks do produce: two thirds produce a little to none; a quarter produce, but not meaningfully; 10% produce significantly.
- Motivations of small block owners: 48% value lifestyle, 38% value both and production, 14% value production.
- Small blocks on versatile land are getting smaller from a median of 8ha in 1970 to slightly under 4ha in 2018.
- The main perception for not producing is because owners deem their block as being too small to generate meaningful income.

Understanding the above, it is suggested that small land holdings are amalgamated to be operated as a larger unit. Four case studies of operators currently doing this successfully were undertaken. These land uses include a regenerative sheep stud, cropping, sheep milking and kiwifruit. The land uses that formed this case study were assessed on the Treasury's Living Standards Framework.

Based on the preferences of small block owners towards lifestyle and production, this report suggests that 55% of lifestyle would be suited for a split of sheep milking or regenerative sheep grazing, 27% would explore kiwifruit and 18% would explore cropping.

If these assumptions hold true, the lifestyle blocks within the focus area could produce 13 million litres of sheep milk, regeneratively graze 20,000 sheep, draw 60,000 tonnes annually of cropping produce (lettuce, broccoli, corn) and 17 million trays of green and gold kiwifruit.

2. Introduction

2.1. International

The world is faced with a daunting problem; a population that is accelerating towards nine billion mouths and a diminishing arable land base from which to produce food. The 50 year period between 1963 – 2013 has seen the agricultural land area per person more than halve from 1.46 hectares per person in 1963 to .70 of a hectare per person in 2013 (Roser & Ritchie, n.d.). Agricultural land has said to have peaked, and the quality of the land remaining is reducing. The two main factors contributing to a reduction in quality of agricultural land are over farming, which has led to soil infertility, and urban expansion, which happens on prime soils near city centres. This metric is going to decrease further, as population growth significantly outpaces that of agricultural land growth. Whilst this is a global problem, it is evident that New Zealand is facing the same challenges. How do we, as a nation, provide the highest level of nutrition from our diminishing land base? Does the answer to this lie in utilizing lifestyle blocks?

2.2. National

“[The area] is so close to Wellington that it is gradually being cut up for residential sections. Gardeners have already been driven out of this portion, so the city must look elsewhere for its market supplies”

The quote above reflects the situation currently facing many cities in New Zealand. This quote was not taken from a recent issue of any national publication, but rather from the Evening Post in 1916. This captures the moment when market gardeners were being forced from Hutt valley due to urbanization. With some help from the government at the time, many of these market gardeners were relocated to Otaki, which is now seeing this same cycle repeat.

As you can see, the process of urbanization around our main city centres is not a new concept. Some of the attributes most sort after when first establishing these city centres; good soils, temperate climate, proximity to water, are also why the spread of city footprints can have a disproportionate effect on the production of certain foods. Horticultural land use, which requires quality soils and temperate climates, usually suffers the most. At a time when 96% of the horticultural produce grown in New Zealand is consumed locally, securing our national food supply is becoming an issue of importance.

The process of urban expansion follows a very similar story; horticultural producers face a period of low profits, either from a series of unfavourable weather conditions, or increased competition as more growers grow the same crop. In turn, growers look for additional sources of cash flow. An exit plan for most is to liquidate their land holding. The highest value is sort from this transaction, which usually results in subdividing the land into smaller (lifestyle) blocks. New residents move in. Growers please new residents by modifying their growing practices. Profit margin is squeezed as rates increase to keep pace with increasing land values and labour is harder to find as workers can't

afford to live locally. More land is sold. Horticultural land moves further away from the city fringe. Cycle repeats.

In many of these cycles it is the lifestyle block owner who is portrayed as the villain intruding on versatile land. However, a conscious decision to sell has been made by a primary producer during this process. A price point has been reached that satisfies both parties and the lifestyle block owner can gain higher utility from the land. This report will not propose to stop this process through policy changes, but rather take the view that this process will continue to happen. Examples will be provided whereby pressure can be taken off of the current food system by utilizing our land more effectively. It endeavours to make lifestyle block owners, who are usually portrayed as fuelling the problem, part of the solution.

3. Focus of this report

The overarching research question for this report is: How can smallholdings be utilized for production without sacrificing lifestyle? As such, it will not argue the factors that contribute to the generation of lifestyle blocks. Instead, it will focus on analysing what can be done to generate more from small holdings of land, in versatile growing environments, without trading off the much sort after lifestyle people demand.

4. Methodology

The report itself can be broken into two distinct sections. An information gathering process, followed by an offering of potential solutions. The information gathering process was a journey of discovery to really understand small block owners. The later section provides potential land uses that may appeal to the motivations of small block owners found in the first two sections, and the extent to which these can generate produce.

A literature review was performed to understand the information that is currently available on these topics, namely urban sprawl and the motivations of small block owners.

After the findings of the literature review were summarized, a survey was performed in an attempt to understand small block owners perceptions to production. The survey comprised of a maximum of 11 questions and a minimum of seven. Branches were placed in the survey based on the answers provided. A copy of the survey is provided in the appendix. 40 small holders participated in the survey, the majority of which came from the focus area. The survey was circulated via lifestyleblock.co.nz, a popular forum for lifestyle block owners, and through word of mouth in the focus area.

In addition to this, interviews were conducted with tenant farmers currently leasing small blocks to understand smart land uses and to gain their perspective as to their relationship with small block owners. These interviews are summarized in the case study section.

These land uses are benchmarked using the Treasury's Living Standards Framework (LSF) (Treasury, 2018). The LSF is a holistic decision-making framework has been introduced by New Zealand's

current government. This approach weights the impact of each land use across four capitals: natural; financial; social; and human capital.

5. Focus Area

This report will focus on the area of land surrounding Pukekohe. Located to the South West of Auckland and straddling the Auckland and Waikato boundaries, this area encompasses a significant density of high-quality soils, a very temperate climate, and, when compared to the national average, is home to a disproportionate amount of lifestyle blocks. This area is roughly 32,000 hectares, 90% of which is made up of class 1 – 3 land. 40% of this area, 13,000ha, is made up of blocks between 1 – 20ha.

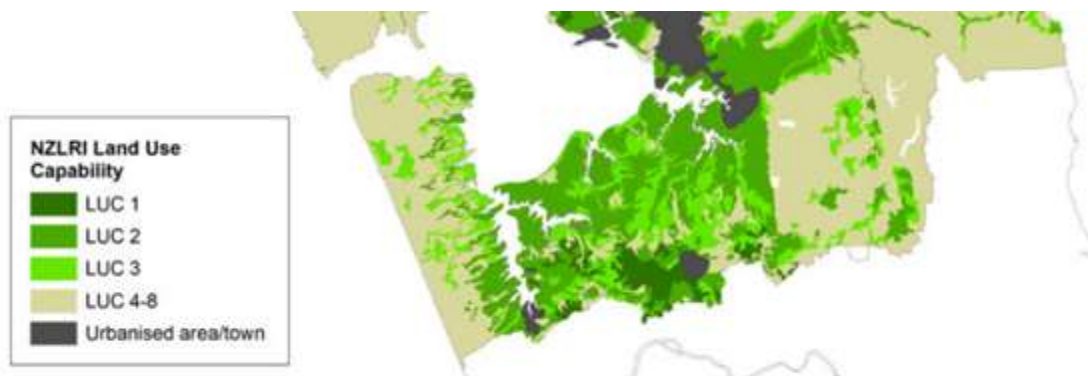
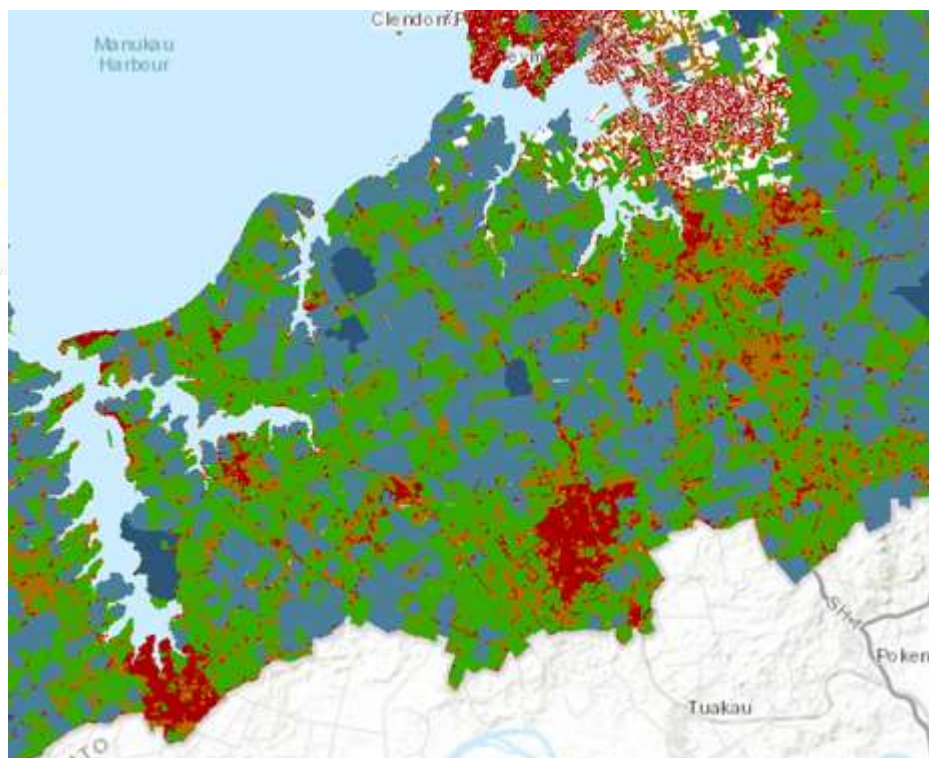


Figure 1. Distribution of LUC classes 1-3 in Auckland using the NZLRI LUC classification as a baseline (taken from Curran-Cournane et al., 2018).



6. Findings

6.1. Literature review

The literature review will be broken into the following sections: characteristics of lifestyle block owners, pressures; land and social, motivations; production v lifestyle.

6.1.1. Characteristics of New Zealand small holdings

In the early 20th century, the main goal of small rural property owners was to be self-sufficient and make an income by selling their surplus. Specialization increased as farmers looked to optimize the revenues from their land. As a result of this, properties were consolidated. This trend reversed in the late 1960s and early 1970s, when harder times faced farmers. This forced them to diversify and sell parts of their land (McAloon, 2009).

A snapshot of a small block owner in 1970s provided by Fairweather (1993) outlines that the majority of owners were family aged (not less than 30 years or over 57 years), 82% had off farm income and the average size was 8 hectares. Jowett (1976) found that small holdings were most commonly used for residential purposes with just under 50% of obtaining a source of income from the land.

A more recent survey of small block owners carried out in the Christchurch area by Fairweather & Robertson (2000) found that the average age of owners was 50 years old, 67% had 'off farm' employment, and the median size of a small holding was 4.1 hectares. Further to this, 65% of small holders surveyed generated income from their land, however, 76% had no intention to generate full time income from their property. The main motivation was to seek peace and quiet, clean air, privacy and country living.

A survey carried in 2018 of small block owners in Auckland (FMG, 2018) found the median age bucket to be 35 – 44, 60% had at least one child (50% of which were under 12), 89% of households had 'off farm' income, and the median size of a property to be 3 hectares. 43% of respondents generate some form of meaningful income from their property. Again, the majority of households moved to their property for peace and quiet, enjoyment and a place to raise children.

The characteristics of small rural property owners in New Zealand mimic the societal and economic trends in New Zealand at any given time. Given this, Land productivity, motivations for ownership, off-farm income and rural experience are all highly variable (Fairweather J. , 1993).

6.1.2. Pressures: Land & Social

Pressures on land:

Versatile land is a limited resource. Comprising of high class soils and favourable growing conditions, versatile land has many competing land uses. The Pukekohe area has a significant

amount of versatile land, and given its proximity to Auckland, it has a disproportionate amount of lifestyle blocks.

Andrew and Dymond (2012) found that lifestyle blocks occupy 873,000ha of land in New Zealand. 148,000ha (17%) of these lifestyle properties are situated on high class land. This equates to lifestyle blocks occupying 10% of New Zealand’s high class land. In comparison, while 29% of urban development between 1990 – 2008 has occurred on high class land, this only represents 0.5% of all high class land. The rate at which high class land is being lost varies by region. 35% of the best agricultural land in Auckland is occupied by lifestyle blocks.

Much of the fragmentation of rural land is largely driven by the desire for rural lifestyle living or hobby farming which can have an adverse cumulative effect over time as it continually fragments large land parcels into smaller parcels (Hart et al., 2013). The effects of this on the Pukekohe area can be seen in the table below:

Parcel size category (ha)	Parcel count		
	1998	2015	% change since 1998 to 2015
0 to <1	1,396 (38,863)	3,544 (55,100)	153.9 (41.8)
1 to <2	501 (4,846)	622 (8,206)	24.2 (69.3)
2 to <4	531 (5,468)	557 (6,863)	4.9 (25.5)
4 to <8	862 (8,153)	798 (7,650)	-7.4 (-6.2)
8 to <50	466 (7,720)	435 (7,182)	-6.7 (-7.0)
50 to <100	17 (949)	19 (967)	11.8 (1.9)
+100	1 (471)	1 (505)	0 (7.2)
Total	3,774 (66,470)	5,976 (86,473)	58.3 (30.1)

Figure 3. Changes in the number of property parcel counts per size category in 1998 and 2015 for the wider Pukekohe area (wider rural Auckland area in parentheses and corresponding percentage (%) change) (Curran-Cournane et al., 2018).

The wider Pukekohe area, 60% of which crosses over in to the focus area of this report, has 3.8% of New Zealand’s total hectares currently in fruit and vegetable production. The revenue of this production generated \$327M in 2017, which equates to 26% of New Zealand’s total domestic value of horticultural production (Deloitte, 2018). The fact the 26% of national revenues come from 3.8% of a specific land base show the significance of the versatile growing conditions in this area.

Social pressures:

Two major social factors affect productively on versatile land close to city centres; Impermanence syndrome and reverse sensitively

Impermanence syndrome mainly affects larger blocks that have the potential to be economically viable. This occurs when rural landowners change their focus from production to immanent capital gain. In this process, investment in the property is significantly reduced as the owners wait for their land to be rezoned. Once rezoned, further subdivision is allowed from which landowners can generate significantly more income through sale, when compared to production. This meaningfully

impacts production, especially when the majority of these landholdings are of an adequate size to be deemed economical.

Reverse sensitivity occurs when the sensitivities of new rural residents impinge on the production activities of neighbouring properties (Paddy & Kerr, 1999). In the context of the focus area, a lack of social cohesion and connection can heighten the issue of reverse sensitivities and make cropping on current rural-zoned land more difficult to manage. It is important for reverse sensitivities to be managed to allow for existing land use to operate as intended, while appreciating the desire for neighbouring landowners to enjoy their property free from interference or nuisance.

6.1.3. Motivations: Production v Lifestyle

Lifestyle:

Lawn et al. (N.D.) found in 1970 that most small block owners were motivated by the appeal of rural living and agricultural production ranked relatively low as a motivation for moving into a rural environment.

A survey conducted in 1980 (Moran, Neville, Rankin, & Cochrane, 1980) split landowners into two categories; full-time and part-time smallholders. Both full-time smallholders (those working full-time on their properties) and part-time smallholders rated important 'to avoid living in an urban environment' and 'to live in a rural environment yourselves'. Part-timers gave their strongest support for 'to raise children in a rural environment'.

These themes were echoed by Fairweather (1993), where three main themes emerged from a survey with Christchurch small block owners. These were; wilderness, peace and quiet, and raising a family. Whilst rural imagery remains important, it does not mean that small block owners are rejecting the city because urban areas are critical to maintaining their lifestyle.

Two surveys were conducted by the Waimakariri District Council (WDC), the first in 1994 (Council W. D., 1994) and second by Sparrow in 1996. These surveys focused on understanding the motivations of new residents in the rural residential area. In both studies, lifestyle and environmental factors were the main attractions. In 1994, "rural atmosphere", "peace and quiet", and "slower pace of life" were mentioned by 33% of the residents (WDC, 1994:30). In 1996, 53 per cent of the residents mentioned "room for children to play", "to avoid close neighbours", "rural atmosphere", and "peace and quiet" (Sparrow, 1996).

More recently, Fairweather (2013) surveyed small block owners in Christchurch. This report found that, when measured on a scale of 1 – 5 (5 being extremely important and 1 being not at all important), that the top three motivations for small block owners were; "Rural or country living", "Peace and quiet, tranquillity" and "Space, privacy, openness, no close neighbours". Further to this, when asked for their preference between lifestyle and land use, 48% of landowners valued lifestyle, 13% valued land use and 39% valued both equally.

The word lifestyle is synonymous with small blocks. Given that it forms part of the naming for some of these blocks, lifestyle blocks, it goes without saying that it is a large motivation for small block landowners. The main motivations for smallholders have been very consistent. These are; clean air, open space, good for family, safe, peace and quiet, and quality of life (Fairweather 2013).

Production:

It is seldom the case that lifestyle blocks are purchased purely for economic reasons. Given this, a higher value is placed on the land that it would otherwise fetch if used to produce. Thus, when viewed from a valuation perspective the property is deemed uneconomical as the financial return generated from the land will not make it a viable economic investment when compared to the purchase price.

Surveys conducted by De Luca (2009) in the Western Bay of Plenty between 1996 and 2006 showed a consistent relationship between new lot sizes and primary production loss. 66% of properties less than 4 ha and 82% of those less than 1.5 ha were not being used for any productive purpose at all. On the other hand, on 29% of lots there was an increase in production following sub-division, generally because of a change from pastoral use to more intensive land uses i.e. kiwifruit. These more productive lots tended to be between 3 and 8 ha in size.

This reduction in productivity is not due to the lands inability to produce, but rather the utility the owner gains from having this land bare exceeds the benefit they could have from producing at its highest use case. This also suggests that the sacrifice in lifestyle that will come from operating the land at a land use capable of providing meaningful returns on purchase price, exceeds any financial benefit of doing so. For context, the median sales price for lifestyle blocks in Auckland for the three months ending April 2019 was \$690k per hectare (REINZ, 2019). Only kiwifruit orchards are meeting or exceeding this value with gold orchards reaching \$1.35m/canopy ha, including crop and green reaching \$450,000 to \$500,000/canopy ha, crop included (REINZ, 2019).

When analysing production of lifestyle blocks in Canterbury, Fairweather (2000) found the following: 62% of respondents did not receive any income from their small holding, 18% received \$5,000 - \$10,000 of income and 11% received more than \$50,000. The median income for this subset was \$5,500. Income per hectare was \$1,341 when put against the median property size of 4.1ha in this sample set. Grazing was the most common source of production for smallholders in this survey, with 42% of respondents indicating this land use. Interestingly, 62% of this sub set that grazed animals did so on 5ha or less. Horticultural land generated the most revenue, with all properties generating above \$50,000 identifying with this land use.

Fairweather (2000) drew the that 38% percent of the time, there is a serious attitude towards production on smallholdings. This serious theme was backed up by FMG survey where 39% of stated that growing something, whether it be for commercial purposes or for their own production, is the highest valued attribute of their property. This is significant because it means the main focus of 39% of small landowners is to grow things.

6.1.4. Conclusion

Clear themes have emerged throughout this literature review: small blocks are getting smaller, lifestyle blocks have used the largest amount of high quality land in urban sprawl, lifestyle is the main goal of small block owners, however, there is a focus on serious production in just over one third of small block owners.

- 175,000 ha of New Zealand's versatile land is currently in lifestyle blocks.
- Small holdings are getting smaller; the median size of lifestyle blocks has decreased from 8ha in the 1970s to just under 4ha in 2018.
- 4ha is the point by which production decreases significantly.
- Characteristics of lifestyle block owners vary significantly over time. These tend to mimic the societal and economic trends at the time.
- The main drivers for purchasing a small holding have remained relatively constant since the 1980s; privacy, open space, quietness and a place to raise a family.
- The propensity to produce has diminished over time. However, just over one third of small block owners have a serious focus on producing.
- Impermanence syndrome and reverse sensitivity are the two social factors to limiting large scale production.

6.2. Survey

Given the findings from the literature review, a survey was conducted to understand motivations towards production and the intent to further this going forward. The survey did not touch on the main motivations of small block owners, as previous surveys have found these to be very consistent over time and favour lifestyle over production.

6.2.1. Overview

The findings from the survey are split into two main themes; those who are currently producing and those who are not. A high-level summary of the two groups can be found in the table below:

	Count (%)	Median size bucket (ha)	Interested in generating additional income (%)
Producing	35 (88%)	3 - 5	24 (69%)
No producing	5 (12%)	3 - 5	3 (60%)

Figure 4. Overview of findings from survey. Count of applicants, and responses to question 5 and question 10.

Those who produce:

88% of respondents claimed to be generating income or produce for own consumption from their land. The median bucket for land size is 3 – 5 hectares, which is the same across both groups. The

mode of this subset is 1 – 2 hectares, which suggests that the correlation between size and production is not as strong as high-level numbers would suggest. The top three land uses are grazing (sheep, cows or goats), produce for own consumption and poultry, each with 83%, 71% and 26% respectively.

When understanding the extent to which the landowner relies on this income, just over two thirds of the respondents state that their property generates little to no monetary income, a quarter generate helpful income that is not their main income, which leaves 6% of respondents drawing their main income from the land.

69% of those who produce are interested in exploring different land uses. A breakdown of which land use can be seen below:

Which land use you like to explore further?	Count (%)
Horticulture (kiwifruit, strawberries, blueberries)	6 (13%)
Cropping	5 (11%)
Produce for own consumption	8 (18%)
Grazing (cow, sheep, goats)	4 (9%)
Tree crops (nuts)	5 (11%)
Dairy	2 (4%)
The best financial use of the land	12 (27%)
Other	3 (7%)
Total	45 (100%)

Figure 5. Summary of responses to question 6 from the survey for those that stated 'yes' to question 1 and 'yes' to question 5

Of those who produce, 31% who are not interested in exploring additional options. The main drivers for why are broken down below:

What are the main drivers for this decision?	Count (%)
Property is too small to generate any meaningful income	6 (35%)
I value what I already have	4 (24%)
It will sacrifice my current lifestyle	3 (17%)
Lack of time	2 (12%)
Other	2 (12%)
Total	17 (100%)

Figure 6. Summary of responses to question 9 from the survey for those that responded 'yes' to question 1 and 'no' to question 5

Those that do not produce:

12% of survey respondents are currently not producing, the median size of the properties not producing is 3 – 5 hectares. Interestingly, 60% of this sub set are interested in exploring ways to increase production on their land. The majority are looking for passive management of their land

and for it to operate at its best financial use. All of those who are not interested in exploring ways to produce cite the fact that their property is too small to generate any meaningful income.

6.2.2. Conclusion

The first point of interest is the fact that, when compared to the findings of the literature review, a high percentage of land owners (88%) stated that they produce. This could be put down to the fact that 'produce for own consumption' was included as an option in this survey, whereas others have focused solely on income generating activities. Furthermore, there may be a natural selection bias. Given that the survey had a focus on production, those that produce would be much more incentivised to complete the survey.

The results from validate many of the findings from the literature review. It was found that just over two thirds generate little to no income, a quarter generate helpful income that is not their main source, leaving 6% generating their main source of income from the land. The percentage of which have a reliance on production is slightly smaller than the 11% stated in the literature review.

The size of properties fits in with the findings from the literature review, with the overall median being 3 – 5 hectares.

One third of the respondents are not interested in generating additional income from their land. The overwhelming majority cited the main driver for this is that their property is too small to generate any meaningful income.

The most interesting subset is those who are not currently producing. This survey was purposely kept short to optimize for completion rate. As a result, there was very limited insight into understanding what land uses, if anything, would potentially attract non producers to produce. Having an understanding into this group is pivotal to testing the utility of small block owners.

7. Solutions

Now armed with the conclusions from the literature review and survey, it is time to propose potential solutions to the question, how can smaller blocks be utilized to maximize both production and lifestyle?

- Owners value rural living, peace and quiet, privacy and a place to raise a family.
- Small blocks do produce: two thirds produce little to none; a quarter produce, but not meaningfully; 10% produce significantly.
- Motivations of small block owners: 48% value lifestyle, 38% value both and 14% value production.
- Small blocks on versatile land are getting smaller from a median of 8ha in 1970 to slightly under 4ha in 2017.
- The main perception for not producing is because owners deem their block as being too small to generate meaningful income.

Given the above, land uses need to be found that marry lifestyle and production.

From an operational sense, it is suggested that small blocks are amalgamated to be ran as a larger operation. Many blocks are falling under the non-productive threshold of 4ha. Amalgamation would create the critical mass needed to make specific land uses viable.

Understanding how small holdings are being utilized in larger operations is a starting point as to potential land uses. Given the diverse characteristics of small block owners, the following case studies explore a variety of land. Each land use is benchmarked using the Treasury's Living Standards Framework.

7.1. Case Studies

The four land uses summarised below are: a regeneratively grazed sheep stud, cropping, kiwifruit and sheep milking. These offer a variety of options to understand the productivity to lifestyle trade off faced by many small block owners. Further to this, these options were most sort after when landowners were asked what options they would like to explore (notable exceptions being tree crops and produce for own consumption).

7.1.1. Regenerative Grazing

What: Regeneratively grazed sheep stud

Financial: \$*** - \$**** per ha

Land leased: 5 small blocks totally 30 hectares

Average block size: 3ha – 6ha

**** owns 7 acres of land in Taranaki. His main production comes from his market garden, which is currently returning upwards of \$***k in revenue per acre. His philosophy for his garden is to focus on crops that are high value with short turnaround times. An example of this are his micro greens. These micro greens have a 4.5 day growing period in summer and 9 days in winter. When finished, these can fetch \$** per kg.

Further to his market garden, **** also runs what is now turning into a Texel/Cheviot sheep stud. Lifestyle blocks play a big part in making this happen. **** currently has just over 30ha of land under lease in five separate agreements. The beauty of his model is that he is using other people land in the process to regeneratively graze. Revenues from his flock have all but recently come in the form of lamb sales, which involves taking market price. However, with the success of this breeding business, he is now set for increased margin.

His regenerative model involves intensive grazing, with long resting windows. Rough resting windows are 90 days in summer and 120 in winter. He measures stocking rates by mass per acre rather than head count, as per Gabe Brown's model. The positive environmental impacts of this approach have been huge. **** recently hosted students from Massey University who identified 16 species of grass on his property, some of which have not been seen in the region for decades.

Operational costs are kept low. The close proximity of his leases means that only 30mins per day is needed to maintain the operation. Capital costs to set up include; mesh electric fencing, portable troughs and portable yards.

**** believes that New Zealand has a very conventional approach to what is expected in return for leasing land. He does not pay for any of his current leases, but rather provides lifestyle block owners with a landscaping service and a high quality of life. **** made reference to a fellow regenerative grazer based in Mendocino, California, who is paid \$80 cents per sheep, per day, to graze land.

The grazing operation currently generates 2% of overall revenues and is responsible for 6% of time allocation. When put in context; 1kg of micro greens, which can be turned around in 4.5 days, can generate the same revenue as a lamb. This aside, **** is adamant about the fact that animals are vital in saving our planet. When used correctly, they are the most valuable tool we have to sequester carbon and improve our soils.

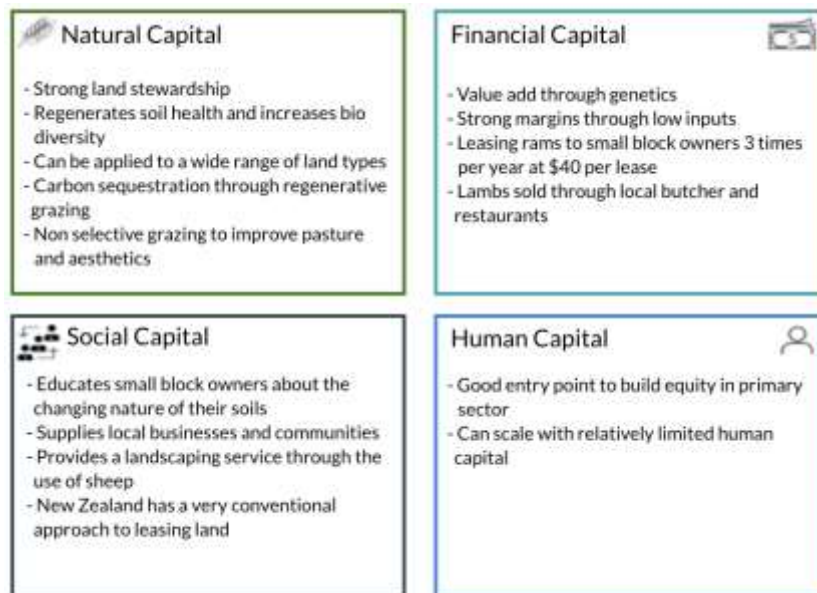


Figure 7. Living Standards Framework for Regenerative Grazing land use

7.1.2. Cropping

What: broccoli, squash, corn, cabbages, spinach, kale, beetroot and lettuce

Financial (per hectare lease): \$**** - \$****

Land leased: 40 – 50 small blocks

Average block size: 8ha – 10ha

Specializing in broccoli, squash, corn, cabbages, spinach, kale, beetroot and lettuce. With a growing area that stretches from Pukekohe to Ashburton and 3,500ha of land under cultivation, ***** is one of New Zealand’s largest producers of horticultural produce.

Small holdings make up a significant portion of their land holding. All of the blocks currently leased are located on versatile soils. The smallest block under lease is 0.7 hectares with the most common small block size under lease being 8 – 10 hectares. There are upwards of 40 blocks of this size currently being utilized.

Many factors are taken into consideration when leasing land. Besides the general ability of the land to produce (access to water, soil types, farming history, etc), operational and logistical aspects of how this lease will fit in with the wider operation are also considered. Some of these additional factors include the season when the lease starts, how this block works in with the current cropping rotations and the proximity to their respective packing houses and areas of critical growing mass.

Many different growing models are applied to each piece of land. Assuming that the land is of high quality and is not prone to flood, there are two additional factors to consider when accessing what to grow on the land; access to water and the landowners requirements.

There are three main types of land; dry land, land with access to river water and land with access to a bore. Squash can be grown on dry land in a two year rotation with corn (sweetcorn, maize or popcorn). This land can also be irrigated for a short period of the year to grow broccoli. River land, with the ability to take water from the river can grow broccoli, fresh market corn and squash. In addition to this, lettuce can be grown in the shoulder seasons. Land with bore access can grow any combination needed to meet market demand.

Leases are also very flexible to cater for landowner requirements. Landowners can make sure certain crops aren't grown, planting isn't carried out in certain seasons and certain externalities are mitigated i.e. noise. A good example of this is how ***** fits in with farm owners finishing winter lambs. Seasonal leases are entered into where ***** plants a summer crop and returns the land to a certain pasture after harvesting, with the landowner only paying for seed in the process.

Further to being flexible on lease terms and land use, great care is also taken to maintain the aesthetic appeal of all properties under lease. Two people are employed to maintain headlands and verges of properties under lease. Quality land improvements and capital works are carried out on properties, if desired by the land owner, with the costs coming out of future payments.

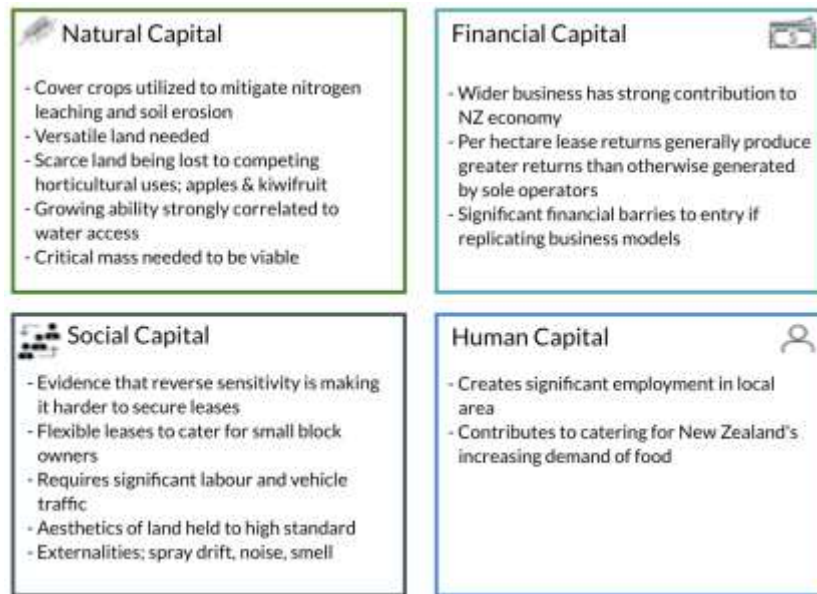


Figure 8. Living Standards Framework for Cropping land use

7.1.3. Kiwifruit

What: Kiwifruit

Per hectare lease: ~\$**,*** p/ha Profit share lease; 85% to landowner 15% to tenant

Land leased: ~3 canopy hectares (1ha gold and 2ha green) of a ~10ha block

Average block size: n/a

The land operator in focus for this case study current leases many blocks in South Auckland. A block that is production levels slightly above median standard has been looked into.

The lifestyle block in question is located in the focus area and has been established for 10+ years, with 2ha of green and 1ha of gold. Last season, the orchard produced 13,000 trays of gold, with a tray price of \$9.50, and 11,000 of green, with a tray price of \$6.50. With growing costs of \$45k and \$35k respectively per hectare, the landowner is left with ~\$**k per hectare in free cash flow.

Kiwifruit leases are an option for small block owners to receive a passive income. Leases are usually set up on a negotiable profit share agreement. The lessee takes responsibility for managing the orchard. Given the profit share agreement, the lessee is incentivized to increase the revenue generated from the block rather than increasing the management fee as a means to increase their income.

Not only does maintaining a crop of this sort require good access to water, but also requires access to labour, and can potentially involve an input intensive system. The operator in question mitigates the potential interruptions caused by spraying and manual activities through clear communication and expectation setting with landowners. Externalities caused by this land use have differing effects on landowners'. The majority of landowners, such as this one in question, only have a portion of

their land in orchard, and it is usually far enough away from the house as to not significantly impact the residents.

As mentioned in the cropping case study, kiwifruit is a land use that is currently in direct competition for versatile growing conditions. Whilst per hectare returns are currently high, so too are development costs. If starting a new development, significant capital is needed to convert the land and it can take three years before generating a revenue stream. Costs depend on the current natural capital of the land i.e. current shelter, water supply, contour, etc. An estimated infrastructure cost to convert is ~\$125k per ha. This is before purchasing any Sun Gold licence, the lowest of which went for \$275k+GST in the last oversubscribed auction. A breakdown of cost to convert is provided in the appendix.

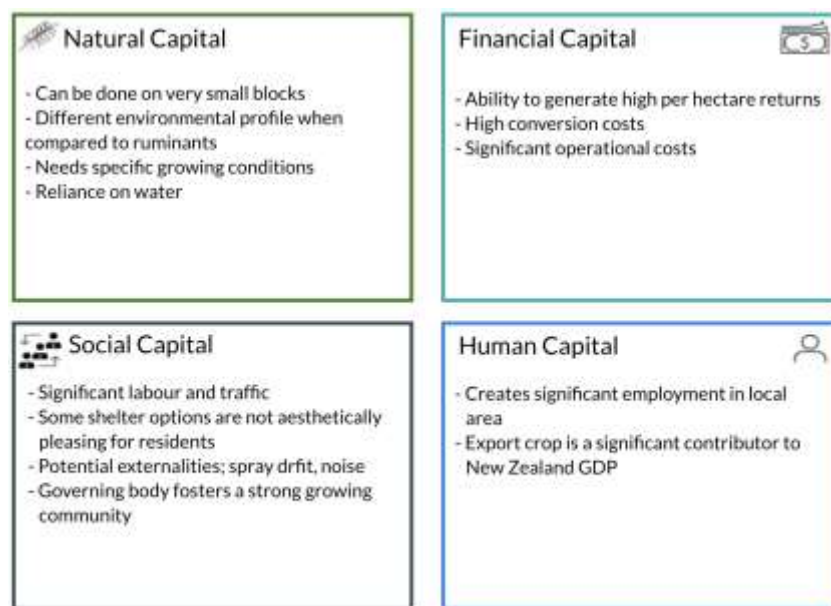


Figure 9. Living Standards Framework for Kiwifruit land use

7.1.4. Sheep Milking

What: Sheep milking

Per hectare return: \$**** - \$*****

Land leased: 20ha

Average block size: n/a

**** holds a 20ha lease in South Auckland. Before being converted to a sheep milking platform, the land was part of a larger cow milking platform. The block is in its infancy of producing and currently has a milking flock of 50 East Friesian sheep. Given this, the land is currently kept under control with grazing cattle as the full ramp up continues.

**** is currently targeting the local cheese market. In order to do so, she has partnered with a local cheese maker. A partnership which will see all current milk production go to this avenue.

Benchmark production, on a once a day milking, is currently one litre of milk per day over a 220 – 240 day period. A milk price is hard to come by, given the early stage of the market for sheep milk. When talking to a sheep milk wholesaler, it is estimated that raw sheep milk sells for \$3 per litre on the local market. Production is set to increase in line with the New Zealand genetic pool, with some local producers targeting 400l/ewe next season as a direct result from improved genetics. The current stocking rate on this platform is roughly 10 sheep p/ha. More established platforms are seeing stocking rates of 16 sheep p/ha.

Conversion costs have been relatively low when compared to other land uses, and can be kept even lower if the small block has an old dairy shed, as some do. A small 10m x 10m shed is currently being built. This shed will house a portable milking system and will be capable of milking up to eight sheep at a time. A minimal amount has been spent on fencing as this was already of a decent standard. A large time cost during this process has been gaining consent.

A point of difference in this operation, and the sheep milking industry, is animal welfare. Some of the more established operators are currently giving away ram lambs and will pay a small amount of rearing costs. This is in a conscious effort to avoid any negative stigma associated with the handling of young stock. Taking this one step further, **** is aiming to develop this system to a point where all lambs are left on the hoof until roughly 10 weeks.

Land stewardship is also a top priority as a lease holder in a rural-urban environment. Since taking on the lease, a creek once converted in woolly nightshade and privet has been replaced with native plantings. Not only does this give back to the land owner, but also sets the stage for generating an additional revenue stream through hosting farm visits. A complementary offering given the proximity to Auckland.

This land use is gaining traction given the nutritional profile of sheep and the relatively low environmental footprint of sheep verse cows. When compared to cows, the milk itself is easier for humans to digest, there is less pugging on the land, and less nitrogen leaching.

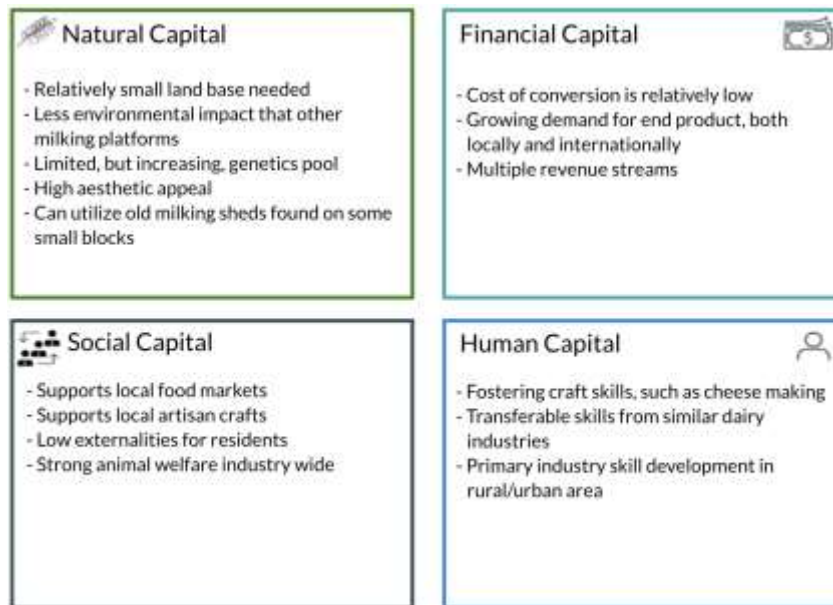


Figure 10. Living Standards Framework for Sheep Milking land use

8. Blind Spots

8.1. Legal

Understanding a legal structure that suits the preferences of small blocks owners has not been tested during this report. Agreeing on a structure that is beneficial for landowners is of critical importance to the success of this concept. Some key questions have been left unanswered: will land be leased or operated as a wider entity? What will that entity look like? Will the landowners hold a percentage relative to the land area they contribute? What happens when a property is sold? How does this cater for landowners that still want to carry out some of the work on their land?

8.2. Environmental

There is a heightened sense of awareness on all environmental issues currently facing the primary sector. Different land uses are currently facing more scrutiny than others. However, all land uses are going to face their own challenges. Especially when these land uses are being operated in an urban-rural environment. Further to this, there are also bio-security concerns facing different land uses.

The environmental costs associated with each land use are starting to get a monetary value attached to them i.e. the additional cost associated with offsetting ruminant methane. When an industry standard is agreed upon, the viability of each land use will have to be reassessed when the additional costs are known. These costs also include what is needed to monitor and report on all environmental concerns.

Biosecurity threats are harder to measure, and even harder to predict. Take PSA and Mycoplasma bovis for example. Very few producers had assigned a probability of having to face the pitfalls of these threats. Globalisation brings immense opportunity. However, it also increases the velocity at which biosecurity threats travel from country to country. An urban-rural area facing unique challenges when trying to avoid or remediate such threats. A deeper understanding for the precautionary and reactive measures to potential threats in an urban-rural environment is needed.

8.3. Technology

Utilizing technology when amalgamating the operation of small blocks is a top of mind that hasn't been explored in detail during this report. The market itself is still in the early stages of adoption, with many primary producers waiting for validation before applying technology to their operations. A separate report would be needed to summarize and validate the breadth of the solutions currently available.

It was interesting to find an example close to the focus area where technology is being trialled to utilize the amalgamation of many holdings of land. This example is the Auckland Council, Farms of the future programme. After talking with Matt Montgomery, Head of Innovation at Auckland Council, it was clear that there are many parallels between what Auckland Council is exploring, and what would be needed to make the concept suggested in this report a success.

The Council currently has 2,500ha of land across 40 holdings that are being utilized for primary production. These holdings vary from functioning farms on regional parks, to small slithers of land left over after infrastructure projects. The intention for this land is to produce more to address the issue of food security, and to do this in a way that is aesthetically and socially appealing.

As part of this programme, the Council is playing the much needed role of an early adopter for many technologies. All of the findings from this programme will be shared openly in an attempt to lessen the risks faced by primary producers when adopting new technology. The plan is to do so in three distinct steps; automating tasks, improve decision making, and predictability and modelling. Many of the Councils land holdings are in the initial phase of automating tasks, with some of the focus areas being fencing, the monitoring of water and the environment, pasture management and animal health.

9. Conclusions

How can smallholdings be utilized for production without sacrificing lifestyle? The solution is twofold: amalgamate the operation of small blocks and align land uses with the motivations of small block owners. A summary of small blocks owners' motivations towards lifestyle v production:

- Current production: 65% limited, to none, 25% some but not meaningful, 10% meaningful
- Lifestyle v production: 48% lifestyle, 38% lifestyle & production, 14% production

The alluvial diagram below shows the potential alignment of land use with the above motivations:

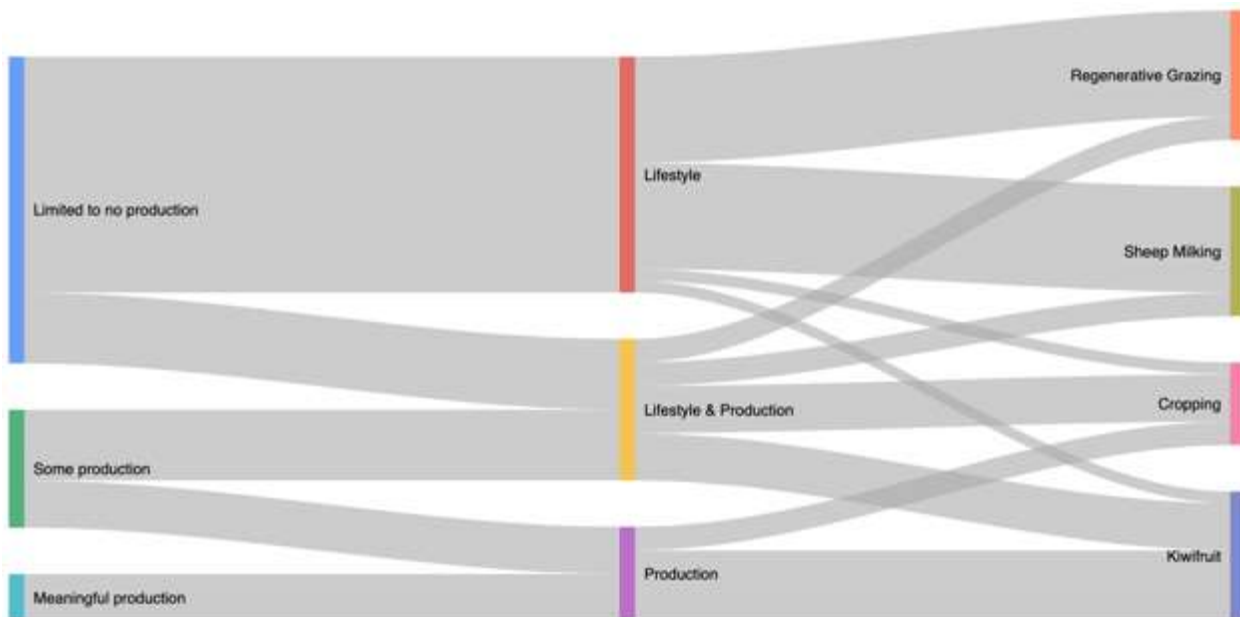


Figure 11. Suggested land use by production v lifestyle

Each land use has a unique profile. The attributes of which will be interpreted differently by individual small block owners. It can be argued that for the majority of small block owners, any form of these activities may come at a loss to their current lifestyle. Given this, there is a strong correlation between increasing financial returns and lifestyle. The increase in financial return comes at the detriment of the social and natural capital. The important relationship here is understanding the marginal financial return needed per hectare in order to sacrifice any form of lifestyle.

If this allocation of land use was to hold true over the current focus area, then the following production could be realized:

	Land (ha)	Production
Regenerative Grazing	2,730	
- Stud stock (1/3) (count)*		6,006
- Lambs (2/3) (count)		15,288
Cropping	1,853	
- Broccoli (tonnes)		22,230
- Squash (tonnes)**		37,050
- Sweet Corn (tonnes)**		35,198
Kiwifruit	1,463	
- Gold (1/3) (trays)		7,239,375
- Green (2/3) (trays)		10,617,750
Sheep milking	2,730	
- Milk (Litres)		13,377,000

Figure 12. Overall production from Focus Area assuming 75% of small block owners choose desired land uses. *Texel/Cheviot stud to occupy 1/3 of land. Remaining 2/3 used for breeding and finishing store lambs. **Squash & Sweet Corn are mutually exclusive. Only the tonnage of one of these two options can be realised each year.

One interesting quote put to me when conducting interviews was an international perspective on the potential held in New Zealand small blocks when compared to the rest of the world. It was stated that New Zealand small blocks are 'the Lamborghini parked in the garage'. The Oxford dictionary states that potential is having the capacity to develop into something in the future. This concept has potential. Now is the time to unlock the garage and start navigating the road.

10. Recommendations

Amalgamate the operation of small blocks to reach critical mass. Critical mass varies depending on the operating land use. Doing so will solve for the loss in production seen around the 4ha mark.

Carry out further research to understand the utility function of small block owners. What are they willing to trade, be it monetary or otherwise, for each slight reduction in lifestyle?

Implement technology as each use is validated via early adopters. In this case, learnings will come from the Farms of the future programme hosted by the Auckland Council.

User test the four land uses discussed in this report to validate the hypothesis of land use adoption. Providing an additional land use utilizing tree crops (nuts) would also be beneficial, given the survey results.

Implement a frictionless legal process that serves small block owners and caters for turnover in properties.

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12. Appendix

1. Copy of survey used :

Small, but mighty!

Smaller farm owners have long been overlooked in terms of their ability to contribute meaningfully to agricultural supply. How much does production on your property matter to you?

* Required

1. Is your property currently generating income or produce for your own consumption? * Mark only one oval.

Yes

No Skip to question 5.

2. **What is your property currently producing?** * Check all that apply.

Grazing (cow, sheep, goats)
Dairying (cows, sheep, goats)
Poultry (chickens, ducks)
Cropping (carrots, potatoes, onions, pumpkin, leafy greens, etc..) Horticulture (kiwifruit, strawberries, blueberries)

Arable (maize)
Produce for own consumption

Other:

3. **What is the estimated annual gross income generated from the current land use(s) (optional)?**

4. **Which one of the following statements best describes the income generated from your land?** *
Mark only one oval.

Our property generates little or no actual monetary income. We work elsewhere to earn a living.

Our property generates some helpful income, but it is not our main income. Our property generates most, or all of our income.

5. **Are you interested in generating additional income with your property?** * *Mark only one oval.*

Yes

No *Skip to question 9.*

6. **Which of the following options would you like to explore further?** * *Check all that apply.*

The best financial use of the land
Grazing (cows, sheep, goats)
Dairying (cows, sheep, goats)
Cropping (carrot, potato, onion, pumpkin, leafy greens, etc..) Horticulture (kiwifruit, strawberries, blueberries)

Arable (maize)
Tree crops (nuts)
Produce for own consumption

Other:

7. **Are you interested in exploring organic practices?** *

Mark only one oval.

Yes No Maybe

8. **What is the optimal amount of time you would like to allocate to your property?** * *Mark only one oval.*

Full time (do all of the work) *Skip to question 10.*

Part time (do some of the work, contract the rest) *Skip to question 10.*

Passive (lease my property or find a contractor to maintain) Other:

9. **What are the main drivers for this decision?** * *Check all that apply.*

Property is too small to generate any meaningful income It will sacrifice my current lifestyle
Lack of time
Lack of knowledge

I value what I already have Other:

Skip to question 10. Skip to question 10.

10. What is the approximate size of your property? * Mark only one oval.

Less than 1ha 1 - 2ha
3 - 5ha
6 - 10ha

11 - 20ha
greater than 21ha

11. What is your post code?

12. Would you be interested in a follow-up conversation? * Mark only one oval.

Yes

No *After the last question in this section, stop filling out this form.*

13. Would you like to receive a copy of the final report for which this data is being used? * Mark only one oval.

Yes *Skip to question 14.* No *Stop filling out this form.*

13. Great, please provide an email address

2. Estimated kiwifruit conversion costs (ANZ, 2019):

POTENTIAL INFRASTRUCTURE INVESTMENT COST RANGES

Source: ANZ Analysis

