

REPORT



PRIMARY
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Rural Production Comparative Analysis Greenfield Study Areas

North, North West and South Auckland

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1. Introduction

1.1 Background to study

The Auckland Council has commissioned Primary Focus NZ Ltd to undertake a study examining the range and value of rural production activities in North, North West Auckland and South Auckland.

The impetus for the study has come from the need for the Auckland Council to accommodate significant urban growth over the next thirty years. The Auckland Council has identified greenfield areas in North, North West and South Auckland and it is necessary to understand the value of the range of rural activities in the greenfield areas and the potential impact that accommodating such urban growth may have on Auckland's rural economy.

1.2 Brief

Greenfield sites in Warkworth, Silverdale, Whenuapai, Kumeu/Huapai and Karaka/Drury, Paerata and Pukekohe have been identified and are the focus of this summary report.

The study reports on the existing rural production activities in these greenfield study areas and provides a comparative analysis on the significance, range and economic value of existing rural production activities currently underway in these areas.

Commentary on the strength of the cross-sectoral (rural production activities) backward and forward linkages and the significance of these in the seven study areas as well as the key elements of the rural production systems in the study areas is also reported on.

High level commentary with regards to the Auckland Plan, the Auckland Economic Development Strategy and planning for future food supply is also discussed.

1.2 Extent of Greenfield Study Area

The seven study areas are located across North, North West and South Auckland. Refer diagram 1.

The areas comprise a mix of rural production activities ranging from lifestyle areas of below 2ha to economic clusters of glasshouses, equine industries, nurseries, fruit and flower growing which includes viticulture.

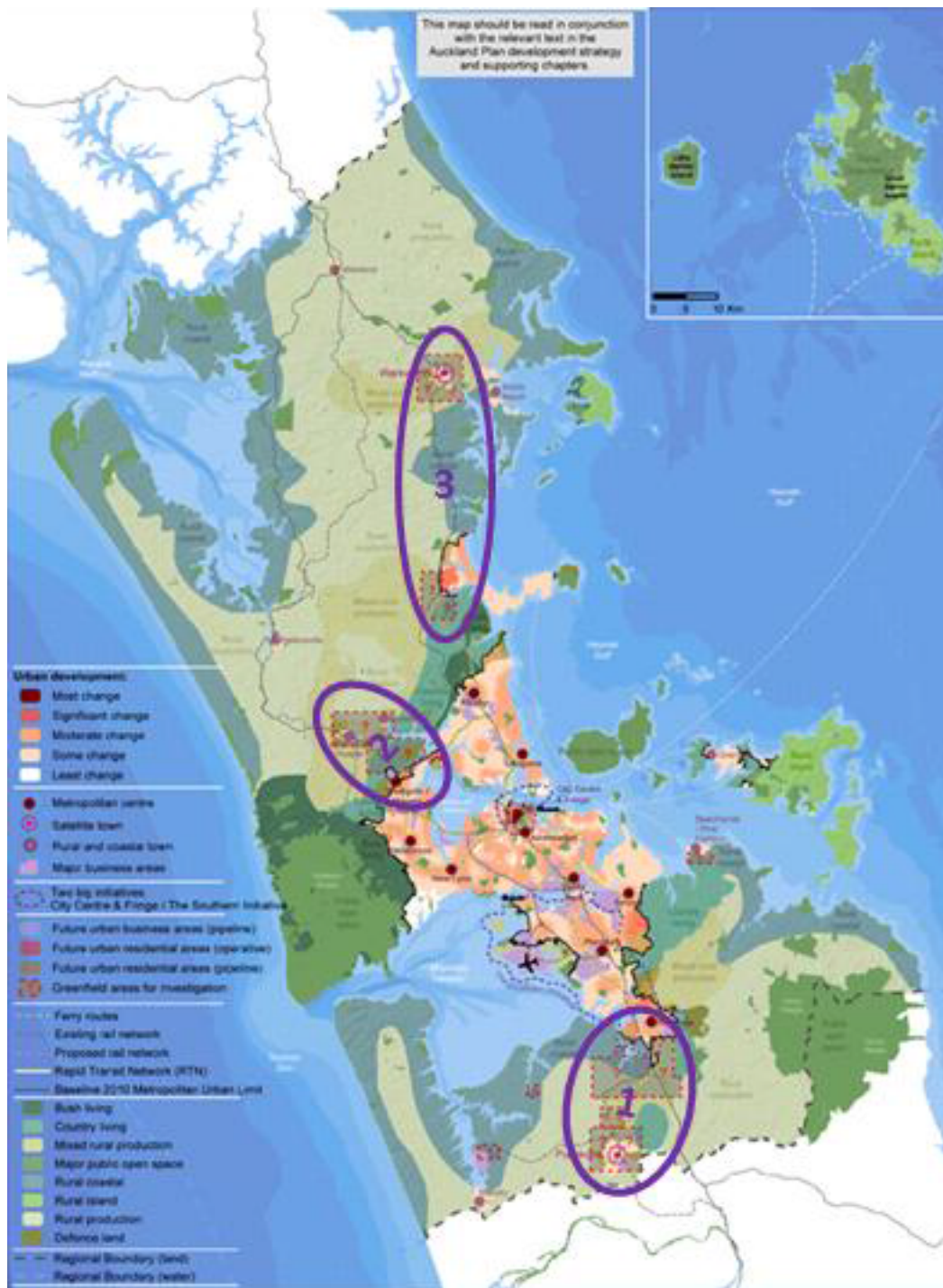


Diagram 1 : Greenfield areas of Investigation¹

¹ Addendum to the draft Auckland Unitary Plan, page 10

2. Summary

Figure 1 below shows \$ turnover and FTE per hectare of the seven greenfields study site from the highest to the lowest.

TURNOVER AND FTE PER HECTARE		
Location	\$ Turnover per hectare	FTE per hectare
Karaka	8,912	0.053
Whenuapai	5,071	0.033
Pukekohe	4,978	0.032
Kumeu/Huapai	3,993	0.025
Paerata	3,087	0.015
Silverdale	1,584	0.007
Warkworth	1,517	0.008

Figure 1 Table showing turnover and FTE per hectare in each of the seven Greenfields study areas.

The Karaka Greenfields study area clearly yields the highest turnover per hectare of all the seven study areas followed by Whenuapai.

VALUE OF RURAL PRODUCTION PER GREENFIELD STUDY AREA, TOTAL VALUE			
SITE	HECTARES	TOTAL TURNOVER \$M	TOTAL FTE
Karaka	6211	55.4	330
Paerata	1621	5	25
Pukekohe	2952	14.7	97
Sub Total (South)	10784 hectares	\$75.1m	452 FTEs
Kumeu/Huapai	3659	14.6	93
Whenuapai	2473	12.5	82
Silverdale	2657	4.2	20
Warkworth	3377	5.1	27
Sub Total (North and North West)	12166 hectares	\$36.4m	222 FTEs
TOTAL	22950 hectares	\$111.5m	674 FTEs

Figure 2 Table showing the value of rural production per Greenfield Study Area and total value.

The total rural production turnover for the Southern Greenfields study area is \$75.1m and for the North and North West Greenfields study areas is \$36.4m.

Despite the North and North West Greenfield areas having 1,382 hectares more land than the Southern Greenfield areas, the South yields a far greater rural production value return than the North and North West Study areas.

In the South, the Karaka area is dominated by vegetable growing and cropping, and although this sector only takes up 4% of the land area it contributes 66% of the area's turnover and 73% of the area's FTEs.

In the North West, the Whenuapai area is dominated by fruit, flower and nursery growing taking up 15% of the land area and contributing 64% of the area's turnover and 65% of the area's FTEs.

The Karaka and Whenuapai greenfield study areas generate the highest rural production turnover per hectare of all the seven greenfield study areas.

3.0 Greenfield Study Areas Comparative Analysis

LAND USE BY PERCENTAGE TYPE IN THE SEVEN GREENFIELD STUDY AREAS								
Area	Vegetable Growing	Fruit, Flower & Nursery	Dairy	Equine	Livestock grazing	Poultry	Lifestyle blocks	Other
Karaka	4%	1%	34%	3%	34%		24%	
Whenuapai	4%	15%	2%	3%	24%	2%	46%	
Pukekohe	12%	1%	24%	6%	39%		15%	3%
Kumeu/Huapai	3%	11%	1%	2%	16%	2%	34%	31%
Paerata		0% (9ha)	53%	2%	27%		14%	4%
Silverdale	0.5%	1%	13%	2%	46%		38%	4%
Warkworth		2%	4%	2%	76%		16%	

Figure 3 Rural Land Use by percentage type in the seven greenfield study areas.

Land use in the Southern study areas is dominated by dairying, livestock grazing and lifestyle blocks. Figure 3 refers. Livestock grazing and lifestyle blocks land use activities take up significant land areas and generate low rural production turnover figures as can be seen in figure 3. The South is strengthened by vegetable growing with high turnover figures and low land use requirements.

Land use in the North and North West is dominated by livestock grazing and lifestyle blocks. These activities, like in the South, take up significant land holdings and generate low turnover figures. The North West study area is strengthened with fruit, flower and nursery land use as the third largest sector to take up land.

RURAL TURNOVER BY PERCENTAGE TYPE IN THE SEVEN GREENFIELD STUDY AREAS								
Area	Vegetable Growing	Fruit, Flower & Nursery	Dairy	Equine	Livestock grazing	Poultry	Lifestyle blocks	Other
Karaka	66%	2%	22%	3%	5%		2%	
Whenuapai	17%	64%	2%	5%	5%	3%	4%	0%
Pukekohe	39%	4%	22%	13%	11%		2%	9%
Kumeu/Huapai	19%	59%	1%	4%	4%	5%	4%	4%
Paerata		4%	79%	6%	9%		2%	
Silverdale	7%	9%	34%	10%	27%		11%	2%
Warkworth		21%	13%	12%	47%		5%	2%

Figure 4 Rural Turnover by percentage type in the seven greenfield areas

RURAL LABOUR USED BY PERCENTAGE TYPE IN THE SEVEN GREENFIELD STUDY AREAS								
Area	Vegetable Growing	Fruit, Flower & Nursery	Dairy	Equine	Livestock grazing	Poultry	Lifestyle blocks	Other
Karaka	73%	3%	15%	5%	3%		1%	
Whenuapai	17%	65%	1%	6%	4%	2%	5%	
Pukekohe	44%	4%	16%	20%	8%		1%	7%
Kumeu/Huapai	20%	61%		6%	3%	4%	4%	2%
Paerata		4%	76%	12%	8%			
Silverdale	10%	15%	25%	10%	25%		10%	5%
Warkworth		26%	11%	18%	37%		4%	check

Figure 5 Rural Labour used by percentage type in the seven greenfield areas

4. Lifestyle blocks

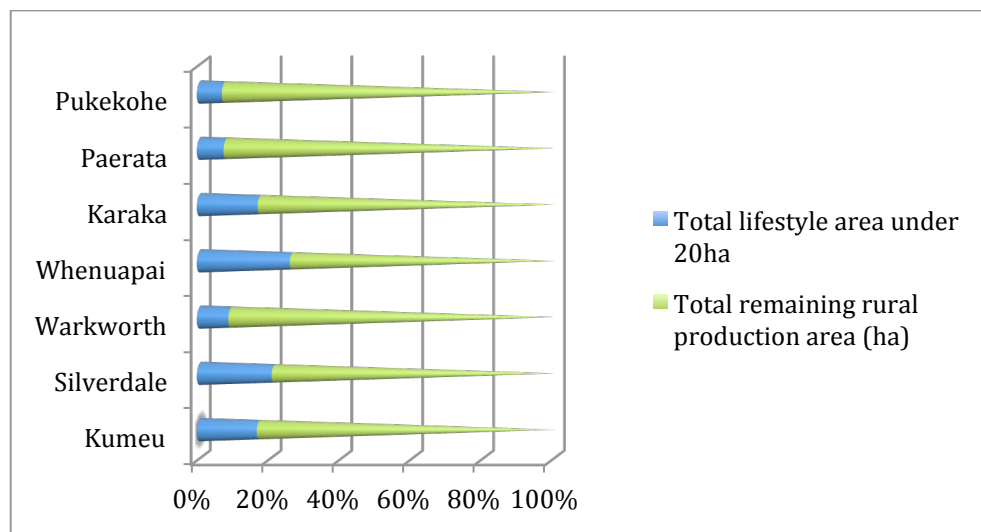


Figure 6 Lifestyle under 20ha as a percentage of the total rural production area per Greenfields study area

North, North West and Southern Greenfields study areas - Lifestyle under 20ha as a percentage of total rural production area			
	Total lifestyle area under 20ha	Total rural production area (ha)	%
Kumeu	612.0	3659	16.73
Silverdale	555.5	2657	20.91
Warkworth	297.4	3377	8.81
Whenuapai	642.3	2473	25.97
Karaka	1056	6211	17.00
Paerata	120.9	1621	7.46
Pukekohe	206.4	2952	6.99

Figure 7 - Table: Lifestyle under 20ha as a percentage of the total rural production area per Greenfields study area

The Whenuapai study area has the greatest percentage at 25.97% of its lifestyle area under 20ha in the total rural production area (Whenuapai study area).

Pukekohe has the lowest percentage at 6.99% of its lifestyle area under 20ha in the Pukekohe total rural production area (Pukekohe study area). However it should be noted that the Pukekohe Greenfields study area includes the township of Pukekohe which has extensive urban development.

The productive value of lifestyle blocks is difficult to estimate. However Lifestyle blocks can earn from as low as \$300 per hectare up to \$10,000 per hectare per year.²

² A Study of Smallholdings and their Owners – (MAF 2003/04)

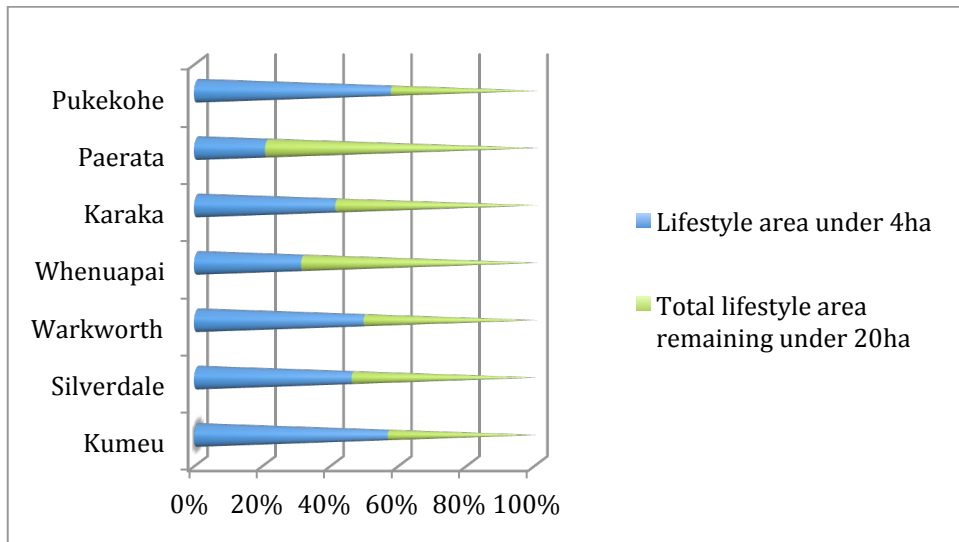


Figure 8 Lifestyle under 4ha as a percentage of total lifestyle area under 20ha

North, North West and South Auckland Greenfields study areas - Lifestyle under 4ha as a percentage of total lifestyle area under 20ha			
	Total lifestyle area under 20ha	Total lifestyle area under 4ha	%
Kumeu	612	345	56.4
Silverdale	556	255	45.90
Warkworth	297	147	49.53
Whenuapai	642	200	31.20
Karaka	1056	434	41.11
Paerata	121	25	20.84
Pukekohe	206	118	56.93

Figure 9 Table Lifestyle under 4ha as a percentage of total lifestyle area under 20ha

Lifestyle blocks under 4ha make up 56.4% of the total lifestyle area under 20ha in Kumeu, followed by Pukekohe at 56.93%, Warkworth at 49.53% and Silverdale at 45.90%.

There is insufficient data to extrapolate the productive value of lifestyle blocks in the seven study areas. It is believed however that lifestyle blocks under 4ha are unlikely to be highly productive with the exception of glasshouse activity.

Pukekohe and Kumeu/Huapai have the largest percentage of low yielding productive value lifestyle blocks of under 4ha followed by Warkworth, Silverdale and Karaka.

5. Comparative Quick Facts

Karaka/Drury

- Dominated by Class II with some Class III soils
- 41.11% of the total lifestyle area of 20ha and under is dominated by lifestyle blocks of 4ha and under
- Generates \$8,912 turnover per hectare

Pukekohe

- Has Class I soils however the majority of these soils are in areas of expanding urban development
- Mix of Class II, III and IV soils
- 56.93% of the total lifestyle area of 20ha and under is dominated by lifestyle blocks of 4ha and under
- Generates \$4,978 turnover per hectare

Paerata

- Has a mix of Class II, III and IV soils
- 20.84% of the total lifestyle area of 20ha and under is dominated by lifestyle blocks of 4ha and under
- Generates \$3,087 turnover per hectare

Whenuapai

- Dominated by Class II and some Class III soils
- 31.20% of the total lifestyle area of 20ha and under is dominated by lifestyle blocks of 4ha and under
- Generates \$5,071 turnover per hectare

Kumeu/Huapai

- Dominated by Class II and some Class III soils
- 56.4% of the total lifestyle area of 20ha and under is dominated by lifestyle blocks of 4ha and under
- Generates \$3,993 turnover per hectare

Silverdale

- Dominated by Class IV soils
- 45.90% of the total lifestyle area of 20ha and under is dominated by lifestyle blocks of 4ha and under
- Generates \$1,584 turnover per hectare

Warkworth

- Dominated by Class III, IV and Class VI soils
- 49.53%% of the total lifestyle area of 20ha and under is dominated by lifestyle blocks of 4ha and under
- Generates \$1,517 turnover per hectare

6. Factors to be considered in regard of land

'Assessments of land and soil value often focus on presence or absence of limitations. The best land is that with no or few limitations.

Productive land, and even more specifically highly productive land, will be fertile and capable of producing abundant yields of plants and other primary products. But more than this, the other factors that together make up an agricultural production system viable will also be present.'

A sole focus on soil means that all landowners with so-called 'versatile soils' are locked into a type of production system that may be neither possible, reasonable or economic.'

While a particular soil may be capable of producing food, there are many factors that also need to be available for land to be used for productive capacity.

Urbanisation has no significant effect on the soil resource – rather it has effects on the productive capacity of the land in question. The production system is what requires protection, not the soil.³

7. Input Output analysis

The Input Output analysis undertaken by Butcher and Partners is limited to the areas of Franklin, Waitakere and Rodney. It is worth noting the rural economies of the former Rodney, Waitakere and Franklin districts and the value of produce consumed locally and exported out of these districts. Such analysis supports the discussion around rural production values in the two reports⁴ and this summary comparative report as well as the evidence obtained from industry interviews and site investigations.

The input output analysis also provides useful insight into how Auckland's local rural economy is performing and provides a basis for comparing the areas in terms of exports and outputs consumed locally.

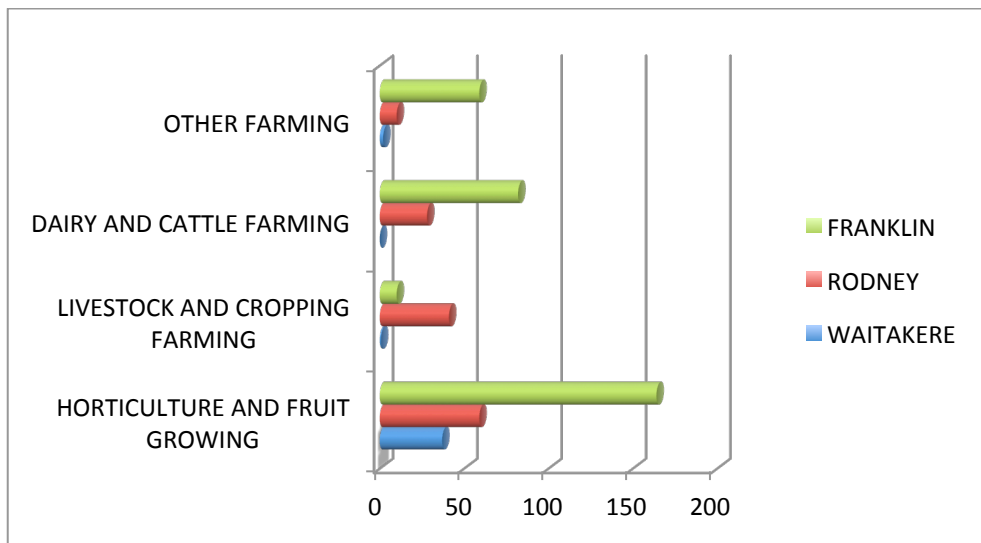


Figure 10 Input Output Table – Exports to other regions and exports (\$m)

³ Versatile soils – Productive Land Report, Hawkes Bay Regional Council, 14 June 2011, Dan Bloomer, Page Bloomer Associates Ltd

⁴ North and West Rural Production Report and Auckland South Rural Production Report by Primary Focus NZ Ltd

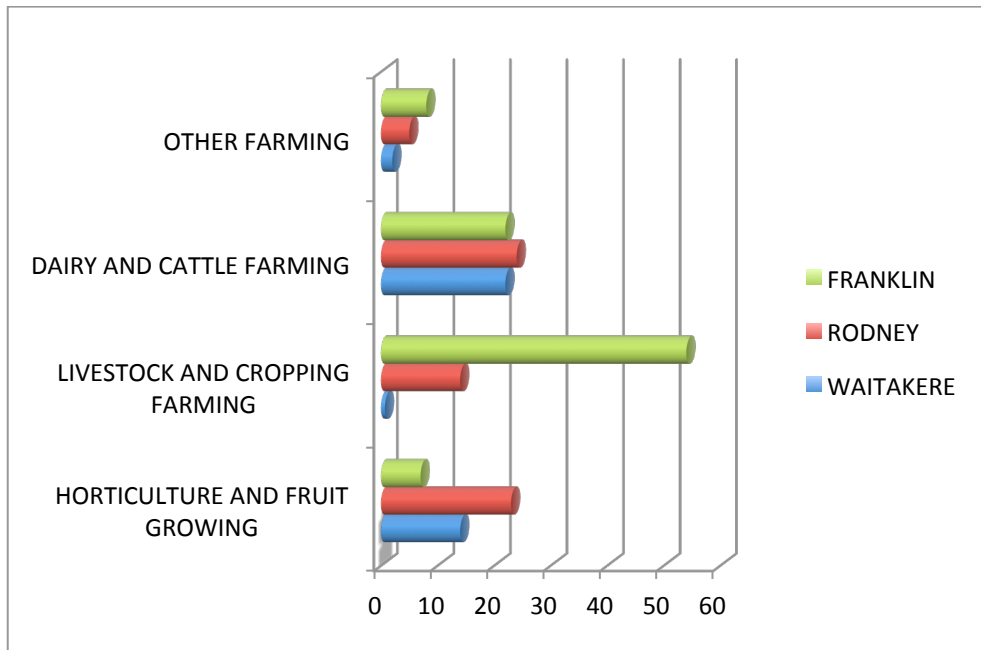


Figure 11 Input Output Table – Outputs consumed locally (\$m)

Franklin far exceeds Waitakere and Rodney in terms of exports to other regions and exports. However Waitakere and Rodney show far greater levels of outputs being consumed locally than in Franklin. This shows a level of resilience in the Waitakere and Rodney districts. The extent of boutique food stores, growers, niche food and wineries in the Waitakere and Rodney districts could be a contributing factor.

COMPARATIVE ANALYSIS INPUT - OUTPUT TABLE : WAITAKERE, RODNEY AND FRANKLIN						
	OUTPUTS CONSUMED LOCALLY (M)			EXPORTS TO OTHER REGIONS & EXPORTS (\$M)		
INDUSTRY	WAITAKERE	RODNEY	FRANKLIN	WAITAKERE	RODNEY	FRANKLIN
HORTICULTURE AND FRUIT GROWING	14,103	22,697	6,680	37,400	59,083	164,166
LIVESTOCK AND CROPPING FARMING	760	13,927	54,194	653	41,080	10,379
DAIRY AND CATTLE FARMING	21,680	24,080	21,680	0	27,873	82,400
OTHER FARMING	1,984	5,383	7,802	2,026	9,816	58,480
TOTAL	38,527	66,087	90,356	40,079	137,852	315,425

Figure 12 Comparative analysis of the former Waitakere, Rodney and Franklin Districts Input – Output table.⁵

⁵ Butcher and Partners

The Franklin District's rural production exported out of the district is worth more than \$315m and more than \$90m of its rural outputs are consumed locally.

These figures are evidence of a thriving rural economy south of Auckland and a marginal rural economy north and west of Auckland.

Despite north and west Auckland study areas experiencing marginal returns in terms of its rural production value, it remains an essential component of the rural production mix for the Auckland region given the role these areas play in the production of nursery plants, viticulture, flowers and fruit growing. The production system in the study areas where these clusters are evident clearly remains intact.

8. Greenfield Study Areas impact on GDP

Strategic Direction 9 of the Auckland Plan states: "Increase the value added to the Auckland Economy by rural sectors by 50% by 2040."⁶

The total value added (GDP) by the rural sector to the Auckland's economy was \$403 million in 2007.⁷ To meet the Auckland Plan's goal would require an increase in the value added (GDP) to \$600 million by 2040.

The current value of rural production turnover in the seven study areas is \$111.5m.⁸ The percentage of GDP to Turnover is 42%.⁹

Should rural production not continue in the seven study areas, the Auckland region could experience a \$43m decrease impact on GDP from the rural sector.

The contribution of the seven study areas to the Auckland region's rural sector's GDP is 10.6%.

9. What could Auckland's rural economy look like in the future?

"Rural production tends to be highly dynamic, with changes being driven by the same forces that drive change in all commercial activities – the need to remain economically viable in evolving market conditions.

In the Auckland region, rural land users face high costs associated with land ownership, with the average pastoral (non dairy) farms typically selling in the 2002 to 2006 period for 2.6 times the cost of the national average for pastoral land. Sale prices of all categories of rural land are higher, not just in comparison to the national average, but also in comparison with neighbouring regions (Figure 5). The value of rural land (as determined by Quotable Value Limited) mirrors sale prices.

These high land values mean that rural producers in the Auckland region may need to produce their goods more efficiently, sell into high value niche markets

⁶ Page 220 of the Auckland Plan

⁷ Draft Auckland Plan, Page 251

⁸ Page 4 of this report

⁹ Assumption based on Berl 2011 Kel Sanderson, Kelly Dustow "Assessment of the Economic Value of Rural Productive Potential in the Greater Otaki Area Study"

and/or increase productivity per hectare by increasing inputs and/or by focusing on higher value products (such as intensive horticulture or factory farming) in order to earn a commercial rate of return equivalent to that achievable in other regions.

The alternative method of meeting the high cost of rural land ownership is to cross-subsidise rural production costs with off-farm income. This means that land owners hold or acquire land, knowing that it will not provide a commercial rate of return. This may not be problematic from a landowner's perspective if they have income from other sources (such as part-time employment or other business interests) to allow the property to be held as a non-independent unit.

Notwithstanding the potential for cross-subsidising the cost of land ownership, the high cost of land (coupled with the high demand for residential opportunities in rural areas) often creates a strong incentive for divestment of parts of farms through subdivision and sale of land.

The driving forces behind change in the rural economy and rural production translate into various environmental impacts, particularly as a result of changes in land use and fragmentation".¹⁰

9.1 Provisioning for Food

Planning in Auckland is currently focused on managing growth, however to ensure that Auckland is sustainable and resilient, as well as positioned for economic growth, it will need to plan for the continued production of food, fibre and aggregate security.

*"A typical (responsible) daily diet for an average human might consist of 50 grams of protein, 300 grams of carbohydrate and 60 grams of fat, i.e. just over 400g of food. (If you live in the "industrial" world you probably eat considerably more.) This means that, at an absolute theoretical minimum, a city of 1 million people would require over 400 tonnes of food per day. However, this weight does not include fibre, the water content of food or the large amount of waste generated during preparation and left after eating. It does not include packaging. Thus, a city of 1 million inhabitants consumes many thousands of tonnes of food items per day."*¹¹

"We are entering a new era of rising food prices and spreading hunger. Food supplies are tightening everywhere and land is becoming the most sought-after commodity as the world shifts from an age of food abundance to one of scarcity. The geopolitics of food is fast overshadowing the geopolitics of oil."

"Brown's warnings come as the UN and world governments reported that extreme heat and drought in the US and other major food-exporting countries had hit harvests badly and sent prices spiralling.

The situation we are in is not temporary. These things will happen all the time. Climate is in a state of flux and there is no normal any more.

We are beginning a new chapter. We will see food unrest in many more places.

¹⁰ <http://www.aucklandcity.govt.nz/council/documents/technicalpublications/Chapter%20%20-%20Driving%20forces.pdf>

¹¹ <http://www.unep.org/greeneconomy/SuccessStories/OrganicAgricultureinCuba>

"Armed aggression is no longer the principal threat to our future. The overriding threats to this century are climate change, population growth, spreading water shortages and rising food prices," Brown says."¹²

Whilst Auckland and New Zealand's competitive advantage may lie in exporting value add processed food and high end food products, it cannot ignore the need to provide food for its own population.

As the demand for land increases in Auckland, so too will demand increase for food, water and energy. Rural production (food) in the future will compete with communities needs for water and energy. Limitations on water supply and energy will impact on rural productivity and hence the supply of food.

Provisioning for food should become a key focus of future planning and policy development.

9.2 Urban Agriculture

The most striking feature of urban agriculture, which distinguishes it from rural agriculture, is that it is integrated into the urban economic and ecological system: urban agriculture is embedded in -and interacting with- the urban ecosystem.

Such linkages include the use of urban residents as labourers, use of typical urban resources (like organic waste as compost and urban wastewater for irrigation), direct links with urban consumers, direct impacts on urban ecology (positive and negative), being part of the urban food system, competing for land with other urban functions, being influenced by urban policies and plans, etc.

Urban agriculture is not a relict of the past that will fade away (urban agriculture increases when the city grows) nor brought to the city by rural immigrants that will loose their rural habits over time. It is an integral part of the urban system.¹³

Auckland's growth and the proposed development of the greenfield sites located in North, North West and South Auckland provide an opportunity to plan for a changing rural landscape. To ensure food supply for Auckland's future population, Auckland will need to consider how it can create, develop and promote urban agriculture and food systems.

Contemporary examples of urban food systems would include farmers' markets, community supported agriculture projects, independent restaurants, local grocery stores, bakeries and other local food processors. But it is urban agriculture systems, including small scale self-production, that have the most prominent role in establishing and maintaining urban food systems. Growing food within the urban area provides the most effective basis for nutrient cycling, for increasing local economic benefit and for the use of otherwise wasted resources. Urban food systems can be found anywhere from small hinterland towns to dense urban neighbourhoods, and provide for greater food security and develop a community resilience that would otherwise be unattainable.¹⁴

'City Farmer', Canada's Office of Urban Agriculture has been promoting and supporting urban agriculture in Canada for more than thirty years.

¹² John Vidal, The Observer, Saturday 13th October 2012

¹³ <http://www.ruaf.org/node/512> (

¹⁴ <http://foodurbanism.blogspot.co.nz/>

A poll conducted by Ipsos-Reid on behalf of City Farmer - found that 44% of people in Greater Vancouver live in households that produce some of their own food.

"That figure represents more than three-quarters of a million people in Greater Vancouver who live in households growing vegetables, fruit, berries, nuts or herbs in their yard, balcony or community garden."

"People have grown food in urban centres from the earliest times and they continue to do so despite the fact that our cities are becoming more populated every year", says Levenston. "This is a positive sign showing us that our cities are still liveable despite recent concerns about the urban environment."¹⁵

The greenfields study areas of North, North West and South Auckland with their already established niche food and linkages with the City provide an incubator for the establishment and development of urban agriculture in Auckland. These areas are already interacting with our urban eco-system. Planning for a changing rural economy is what will help Auckland achieve its economic targets and build community resilience.

10. Conclusion

The Karaka/Drury Greenfield study area generates the highest rural production turnover per hectare at \$8,912 of all the seven study areas in the Auckland region. This is followed by Whenuapai at \$5,071, Pukekohe at \$4,978 and Kumeu/Huapai at \$3,993.

Consideration must be given to the productive system in place and the strength of such a system to the local economy. Productive land, and even more specifically highly productive land, will be fertile and capable of producing abundant yields of plants and other primary products. But more than this, the other factors that together make an agricultural production system viable will also be present.¹⁶

It is clear that these production systems exist in parts of the seven study areas. It is these systems that need protecting. Highly fertile soils should not be the justification for limiting urban growth but rather the existence of highly efficient and established production systems, supported by highly fertile soils if needed by industry type, should be considered when developing greenfield areas.

Lifestyle blocks under 4ha make up 56.4% of the total lifestyle area under 20ha in Kumeu, followed by Pukekohe at 56.93%, Warkworth at 49.53% and Silverdale at 45.90%.

There is insufficient data to extrapolate the productive value of lifestyle blocks in the seven study areas, however it is believed that lifestyle blocks under 4ha are unlikely to be highly productive with the exception of glasshouse activity.

There are some economic clusters of significance in the study areas – the Karaka/Drury area is dominated by intensive glass house rural production, Pukekohe has a well-established high yield equine industry, the Kumeu/Huapai and Whenuapai areas have economic clusters of nursery plants, flowers, fruit growing and viticulture.

¹⁵ <http://www.cityfarmer.org/44percent.html#44percent>

¹⁶ Versatile Soils – Productive Land Report, Hawkes Bay Regional Council, 14 June 2011, Dan Bloomer, Page Bloomer Associates Ltd

It is clear that despite the intensity of lifestyle development under 4ha in the study areas, the production system in parts of the Kumeu/Huapai, Whenuapai and Karaka/Drury Study areas continue to function well.

It is also worth noting the Input Output analysis undertaken for the Rodney, Waitakere and Franklin Districts which show that exports outside of Franklin far exceed what is exported out of Rodney and Waitakere. However Waitakere and Rodney show far greater levels of outputs being consumed locally than in Franklin.

This shows a level of resilience in the Waitakere and Rodney districts and also provides a platform for urban agriculture initiatives. The greenfield study areas of North, North West and South Auckland are already interacting with our urban eco-system.

Planning for a changing rural economy is what will help Auckland achieve its economic targets and build community resilience. Any development within the greenfield study areas should take consideration of the need to plan for a changing rural economy and to use this as an opportunity for economic growth driven versus economic growth fuelled by population growth which is unsustainable.

Limitations to Study

This study has been limited to project brief and access to AgriBase and Stats NZ data.

Agribase data supplied and used for the study is based on data collected from each property over the past 16 years, from 1996 to 2012. Properties have not been interviewed more than once over that time and changes in farm use are likely to have occurred with some of them.

Land areas relating to the Greenfield Study areas have been provided by the Auckland Council. Totals of land areas vary to area boundary due to titles going beyond Greenfield boundaries.

The valuation of the rural production value is not a precise science, it can vary over time, between geographical areas and between farming types. The international commodity prices are still the major driving force for determining the yearly value of rural production. The last 12 months is a good example of how rapid changes can occur.

For the purpose of this study, we have used information from a combination of sources. By applying the same methodology to each of the Greenfield sites we have a basis for comparison and a rural production value at a point in time.

The hectare of each farming type were provided by the Auckland Council based on analysis of Agribase Data pertaining to the Greenfield sites.

The method to value rural production was carried out by taking the land area of various farming types and applying the "typical" turnover per hectare earned from these farming types. This information was obtained from various sources however the Berl Paper Ref 5118, proved very useful due to it's recent study (Sept 2011) and the variety of farming systems which it valued. For farming systems outside the categories described in the Berl study, specific industry information was obtained where available.

A similar process was also used for valuing value added (GDP) and quantifying employment (FTE). Turnover and FTE rates per hectare were applied using the Berl 2011 Kel Sanderson, Kelly Dustow report. As a result seasonal labour fluctuations have not been picked up and FTEs may seem lower than expected. In some cases land use pertaining to intense activities such as processing may have significantly higher FTEs than reported.

In most cases a large percentage of the land in the Greenfield sites is currently classified as Lifestyle Blocks. Previous studies show that production from these can vary particularly when the blocks are very small (0- 2ha). These are the most common size blocks in each of the four study areas. By applying a standard turnover per hectare to all lifestyle blocks regardless of block size we believe we have over, rather than undervalued the production turnover obtained from Lifestyle blocks.

Lifestyle blocks have all been treated the same. The \$500/ha output would be high for many, however this would be offset by the high spending of many of these blocks.

In order to be able to compare the Greenfield sites of North, North West and South Auckland, we have used consistent information for calculating out the value of rural production. It is only the area of land for each farming type that has been changed according to the data provided by the Auckland Council. Please note then that the higher production capabilities of higher class land has not been

taken into account but rather discussed in the commentary under section 9 and 10 of this report.

The Input Output analysis information is available down to District level. This information was obtained for the Franklin, Waitakere and Rodney districts. However as the study is looking at specific sites in each of the districts and these areas are only small footprints of the total district we have chosen to use the same inputs outputs for each of the Greenfield sites' related district.

In summary the main determinant of the rural production value is the area of land involved in high value farming types per hectare, such as horticulture and to a lesser extent dairying. Much of the land area is already in lifestyle blocks, which in general return lower turnover per hectare returns than some intensive fulltime farming systems. Further work is needed to look at what value is possible and what is required to obtain this from lifestyle blocks, however this is outside the scope of this study.

The multiplier information used is based on the 2006-07 rural census. Calculation of the FTE labour was scaled back by a 12.5% inflation factor. The 12.5% figure for inflation was suggested by Geoff Butcher of Butcher and Partners. The employment tables report results as at 2006-07 prices. The outputs calculated in this report reflect 2011-12 prices. To bring these outputs back to 2006-07, five years deflator at 2.5% general inflation was calculated thus the 12.5% inflation factor was used.

Glossary of Economic Terms

Employment

Employment is work done by employees and self-employed persons, and is measured in Full-Time-Equivalent jobs (FTEs). A person working part time all year is deemed to be equivalent to 0.5 FTEs. Where work is seasonal, the conversion to FTEs is based on 12 months work per year. So a seasonal worker working full time for six months per year is 0.5 FTEs, and a part time seasonal worker working ten hours per week for 4 months is 0.1 FTEs.

Output

Output is the value of sales by a business. In the case of wholesale and retail trade it is the total value of turnover (and not simply gross margins)¹⁷.

Value Added

Value added includes household income (wages and salaries and self-employed income), and returns to capital (including interest, depreciation and profits). It also includes all taxes. Put another way, Value Added is equal to Output less costs other than wages, salaries, depreciation and interest. From an accounting perspective it is equivalent to EBITDA plus Wages & salaries.

¹⁷ Care has to be taken in combining retail sales figures with employment per \$million of output from input-output tables. In these tables, output is generally defined as gross margin. By contrast, business statistics usually refer to employment per \$million of turnover.

Household Income

Household income is the gross earned income of households. It includes the income of self-employed persons. There is sometimes considerable uncertainty as to the proportion of business income, which goes to households, especially for small businesses. In assessing this proportion, dividends and interest payments have been excluded. When estimating indirect economic impacts, one needs to know the increase in household income, which occurs in the region.

Direct Economic Impacts

The direct impact is the output and employment of the business itself (in this case the farm). The direct employment is of people who work on the farm. The direct output is the value of farm gate sales. The direct value added is the value added on the farm. It is equivalent to operating surplus, before interest or tax, plus wages, salaries and drawings.

Indirect Economic Impacts

The indirect impact arises from increased spending by farms as they buy additional inputs so that they can increase production to meet plant demands. This indirect effect can be envisaged as an expanding ripple effect. For example, the farm buys fertiliser, the fertiliser factory has to employ more staff and buy more electricity, so the electricity industry expands. The electricity industry has to employ more staff and buy more fuel, so the fuel company increases its output. And so on. All the increased employment, output and value added (apart from that at the farm) are the indirect effect.

Note that indirect effects only include "upstream" effects (via buying more inputs), but do not include any stimulated development downstream, such as processing vegetables.

Induced Economic Impact

The induced impact is the result of increased household income being spent, and leading to a further ripple effect of increased employment, output and income.

Flow on Effects / Upstream Impacts

The sum of indirect and induced effects is sometimes termed the flow on effects, or upstream impacts.

Down Stream Impacts

Impacts which are not driven by an activity's demand for extra inputs, but which might arise as a result of a particular activity, are sometimes called the "Downstream impacts". The obvious example in the farming industry is the processing sector, where there is whole new set of direct and flow on effects. These effects are not included in the initial farm impacts, which focus only on the supply of inputs.

Total Economic Impacts

The total Type I impact is the sum of the direct and indirect impacts, and a Type II impact is the sum of direct, indirect and induced impacts.

Multipliers

A Type I multiplier is the ratio of (direct + indirect) impacts to direct impacts, and a type II multiplier is the ratio of (direct + indirect + induced) impacts to direct impacts. The Type II multipliers include the impact of household spending and hence will always be greater than a Type I multiplier. Both multipliers will always be greater than 1. Note that downstream effects (whether positive or negative) are not included in the multiplier, and must be calculated separately.

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David has a degree in Agriculture Commerce and Economics. He is an experienced business operator with a strong analytical bias. Initially David carried out research and marketing for some of New Zealand's key manufacturers. Industries included, steel ,plumbing, building products and various engineering and materials handling disciplines.

In 1998 David established his own business in the fields of engineering (water and waste water) and farming. David has been involved in rural development for the past two years, focusing in particular on undertaking extensive analysis work of the Auckland and Waikato rural economies.

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