



economics

Report to:

Kapiti Coast District Council

**ASSESSMENT OF THE ECONOMIC VALUE OF
RURAL PRODUCTIVE POTENTIAL IN THE
GREATER ŌTAKI AREA**

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Assessment of the economic value of rural productive potential in the greater Ōtaki area

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1 Summary

This report has been prepared by BERL for the Kapiti Coast District Council (KCDC). The objective of this report is to provide the current economic value of rural productive land in the greater Ōtaki area, and to assess, using a range of scenarios, the potential economic value of rural productive land for this area by 2030.

The greater Ōtaki area covers a total of 40,076 hectares of land, of which 11,506 hectares is in rural production. This analysis concentrates on the potential expansion of Horticulture in the greater Ōtaki area, as identified in both CRI 2005 report and Landcare's report of 2010. According to the CRI report there is a total of 6,701 hectares of land that is suitable for horticultural production. Currently, only 670 hectares of this land is used for horticultural production. The following scenarios have been developed to provide direction on the potential economic value that expanding horticultural and therefore rural land has for the greater Ōtaki area in terms of output, gross domestic product and employment:

Scenario 1: The 2005 CRI Scenario – increase horticultural land to 1,010 hectares

Scenario 2: Upper Bound Scenario – increase horticultural land to 6,701 hectares

Scenario 3: Horticulture Stretch Scenario – increase horticultural land to 3,000 hectares

The total impact of these scenarios on the economic value of rural productive land in the greater Ōtaki area are summarised in the table below.

We estimate that the total impact on the economy from the rural land in the greater Ōtaki area currently produces \$63.6 million in output, GDP of \$27.0 million and employs 396 FTEs.

Using a conservative approach outlined in the CRI 2005 report of increasing the amount of rural productive land in horticulture to 1,001 hectares (Scenario 1), increases the total impact above the current level of output by \$9.1 million, of GDP by \$4.1 million, and employs 76 more FTEs.

If all land suitable for horticulture (6,701 hectares) is used (Scenario 2), then this is the Upper Bound of horticultural production. It would increase current production on rural land by \$195.5 million, GDP by \$87.6 million and provide 1,374 more jobs within the greater Ōtaki area. Full utilisation of horticultural land would thus result in a dramatically larger economy. The feasibility of achieving this scenario is out of scope of this report.

Table: 1.1 Summary of scenario analysis

Land Use	Current Value of rural productive land	Scenario 1: 2005 CRI Scenario	Scenario 2: Upper Bound Scenario	Scenario 3: Horticulture Stretch Scenario
Total Impact				
Gross Output (\$mn)	\$63.6 mn	\$72.7 mn	\$259.1 mn	\$160.9 mn
Value Added (\$mn)	\$27.0 mn	\$31.1 mn	\$114.6 mn	\$72.1 mn
Employment (FTEs)	396	472	1,770	1,087
Increase from current				
Gross Output (\$mn)	-	+\$9.1mn	+\$195.5mn	+\$97.4mn
(%)		+14%	+307%	+153%
Value Added (\$mn)	-	+\$4.1mn	+\$87.6mn	+\$45.1mn
(%)		+15%	+324%	+167%
Employment (FTEs)	-	+76	+1,374	+691
(%)		+19%	+327%	+174%

Source: BERL

Therefore, Scenario 3 demonstrates a more achievable outcome. This estimates what the value of rural productive land would be, if horticultural land increased to half of its maximum potential, namely to 3,000 hectares. Increasing the horticultural potential in the Otaki area will also increase the possibility of locally processing foods, which is the pattern observed in other major food producing regions throughout New Zealand (Canterbury and Hawke's Bay). Therefore this scenario assumes that local processing capacity is developed. With increased horticultural production, this scenario also reflects the possibility of local processing. Increasing horticultural land to 3,000 hectares increases the total impact on output to \$160.9 million, GDP to 72.1 million and FTEs to 1,087. Compared to the current use of rural productive land, output increases by 97.4 million, GDP by 45.1 million, and employs 691 more FTEs.

There has been steady expansion of horticultural production in New Zealand in the past,, and we show this over the last 19 years. Therefore encouragement and assistance to an expansion of horticultural production in the Ōtaki area in a range of crops, could be expected to result in achieving this 3,000 hectares in horticultural production by 2030.

A fourth scenario 'Otaki Fine Food Destination' explores the concept and possibility of assessing the ability of the greater Otaki area becoming a fine food destination. These conceptual considerations indicate that it would be worthwhile investigating in more detail the potential shape that the development of the Ōtaki area would take.

2 Introduction

the Kapiti Coast District Council (KCDC) commissioned BERL to assess the economic value to the District of development of the rural productive potential in the Greater Ōtaki area.

The objective of the professionals in the KCDC is to be able to know with some level of certainty:

- **What is the potential impact of development of the land potential in the greater Ōtaki area?** This is in terms of the economic numbers as well as some qualitative description of the impacts on the communities.

The purpose of this assessment is to give guidance to the KCDC as to:

- **How much effort and resource should KCDC commit to initiatives to achieve the land use potential?**

BERL has employed a two staged approach to answer the above question. Firstly, we have we have assessed the current economic value of rural productive land in the greater Ōtaki area (presented in Chapter 3). This is represented in terms of the output rural land currently produces, its contribution to gross domestic product and the number of people employed in rural industries. The second stage of this report is presented in Chapter 4. The second stage, looks at the current use of rural productive land, and assesses the potential impact that changes in rural productive land, in particular horticulture, has in terms of increasing output, GDP and employment.

3 Current economic value of rural productive land in greater Ōtaki area

This section identifies the area of rural productive land in the greater Ōtaki area, and estimates the current economic value of this production in terms of output, GDP and FTEs.

3.1 Current area in rural productive land

The area of rural productive land in the greater Ōtaki area was obtained by combining and relating the different land-uses reported in Landcare's 2010 report¹ and the 2005 report by AgResearch, Hort Research et al². The current land-use in the greater Ōtaki area, as used for this report, is presented in Table 3.1 below.

Table 3.1: Areas of each land use in Greater Ōtaki area

Land Use	Area
	(ha)
Urban	945
Peri Urban	1,645
Primary industry	
Horticulture	670
Sheep, beef and cropping	1,925
Dairy and cattle farming	4,160
Other farming	1,400
Forest plantation	1,706
Total Primary industry	9,861
Conservation etc.	27,625
TOTAL	40,076

Sources: BERL database and numerous.

There is a total of 40,076 hectares in the Greater Ōtaki area, of which 11,506 hectares is rural productive land. Rural productive land is the summation of land classed as Peri Urban³ and Primary Industry.

¹ Assessment of rural productive potential in the Greater Ōtaki area: Scenarios and options for a sustainable food future, Landcare Research, 2010

² Mackay Alec, B Clothier, T Mills, M Jessen, P Newsome, J Willoughby, J Reid, J Neild. *A study of the rural productive potential in the northern part of the Kapiti Coast District*. Palmerston North, September 2005.

³ The Peri Urban sector are the lifestyle blocks which are people who live on rural land, in some cases produce crops and commodities for sale and in others use it for hobbies like equestrian activities. They generally derive their main source of income from other sources, though may supplement that from their land, operating B&B or the like.

3.2 Per hectare value of rural productive land

To obtain the rural productive potential and therefore the derived value of this land, statistics on the income obtained from different types of land-use were obtained from various sources.

These include:

- Horticulture and viticulture – Most data was obtained from FreshFacts 2010. This is a publication produced by MAF, Horticulture New Zealand and Plant & Food Research. More detailed data on the income earned from land was obtained from MAF's farm monitoring reports for pipfruit and viticulture, and New Zealand Winegrowers Annual report for 2011.
- Dairy – Data was mainly obtained from MAF Farm Monitoring reports and Dairy New Zealand's Economic Survey and Dairy Statistics reports.
- Beef and Sheep – MAF Farm Monitoring reports and Beef and Lamb New Zealand on-farm data.
- Forestry – Data obtained from Forest Owners Association and MAF.

We also accessed Statistics New Zealand's Agricultural Production Census 2007 to ensure that the figures are reflective of the fruit and vegetables produced in the Greater Ōtaki area.

The above sources allowed us to derive the value of production per hectare from different types of rural land in the greater Ōtaki area.

3.3 Economic value of rural productive land in the Greater Ōtaki area

To provide the economic value of rural productive land in the greater Ōtaki area, we assessed the rural productive value of the greater Ōtaki area using a conventional multiplier analysis⁴. Multipliers allow us to identify the direct, indirect and induced effects of rural productivity in terms of output (GDP) and Full Time Equivalent (FTE) employment.

This involves analysing the output and employment impacts of rural productive land in two parts. The first is the initial or direct impact. This is the output and employment from the rural land-use in the Ōtaki area and those that are dependent on this land-use. The direct impact uses input-output tables developed by Butcher and Associates. The input-output tables have

⁴ Further explanation of multipliers are provided in the Appendix.

been adjusted to reflect an area that does not carry out a high degree of processing. Increasing processing capability will be investigated in Scenario 2 of this report.

The second part of the multiplier analysis is the flow-on impact. The flow-on impact (also known as indirect and induced impacts) account for those effects of increased activity in rural productive land on other industries e.g. increased inputs into rural productive land or employees spending their money. The flow-on impacts are calculated using a set of multipliers. The multipliers used depend on the geographic focus the greater Ōtaki area. These impacts are added to the initial impact to give the total impact.

Direct, indirect and induced impacts are measured in three ways:

- **Gross output** is the value of sales from the hectares being used in agricultural production.
- **Value added** measures the contribution to Gross Domestic Product.
- **Employment** is based on the number of full time equivalent (FTEs) that are created from output.

3.3.1 *Direct impact of rural productive land in the greater Ōtaki area*

Table 3.2 below shows the total land used by primary industry in the greater Ōtaki area, and estimates the direct impact of rural productive land in terms of gross output, value added (or GDP) and employment (FTEs) generated from the production in each land use.

Table 3.2: Direct impact of rural productive land in greater Ōtaki area

Land Use	Area	Direct Impact				
		Gross Output		Value Added	Employment (FTEs)	
	(ha)	(\$mn)		(\$mn)	Otaki In region	Rest of NZ
Urban	945					
Peri Urban	1,645	\$0.66		\$0.2	2	
Primary industry						
Horticulture	670	\$14.3		\$6.4	120	0
Sheep, beef and cropping	1,925	\$1.9		\$0.7	9	5
Dairy and cattle farming	4,160	\$19.3		\$8.4	108	21
Other farming	1,400	\$0.8		\$0.2	5	0
Forest plantation	1,706	\$2.4		\$0.7	6	0
Total Primary industry	9,861	\$38.8		\$16.4	248	26
Conservation etc.	27,625					
TOTAL	40,076	\$39.4		\$16.6	250	26

Sources: BERL database and numerous.

The input-output tables and the multipliers derived from them enable us to estimate that for the \$38.8 million worth of gross output generated by the primary industry in this area, there is employment of 248 FTEs within the area, and a further 26 directly employed in the rest of New Zealand.

3.3.2 Total impact of rural productive land in the greater Ōtaki area

The total impact is the summation of direct, indirect and induced impacts. Table 3.3 shows the total impact of current land-use in the greater Ōtaki area.

Table 3.3: Total impact of rural productive land in greater Ōtaki area

Land Use	Area	Total Impacts					
		Gross Output (\$mn)		Value Added (\$mn)		Employment (FTEs)	
	(ha)	Otaki In region	Rest NZ	Otaki In region	Rest NZ	Otaki In region	Rest NZ
Urban	945						
Peri Urban	1,645	\$1.1					
Primary industry							
Horticulture	670	\$22.9	\$12.4	\$10.2	\$5.9	180	49
Sheep, beef and cropping	1,925	\$3.4	\$1.7	\$1.4	\$0.7	20	2
Dairy and cattle farming	4,160	\$30.9	\$15.3	\$13.4	\$7.0	173	54
Other farming	1,400	\$1.4	\$0.8	\$0.5	\$0.4	8	4
Forest plantation	1,706	\$3.8	\$2.6	\$1.5	\$1.1	16	9
Total Primary industry	9,861	\$62.5	\$32.8	\$27.0	\$15.1	396	118
Conservation etc.	27,625						
TOTAL	40,076	\$63.6	\$32.8	\$27.0	\$15.1	396	118

Sources: BERL database and numerous.

The current rural production in the greater Ōtaki area including the indirect and induced effect is \$63.6 million, GDP (or value added) is \$27 million, and the activity employs 396 FTEs.

There is also considerable economic activity created in the rest of New Zealand from increasing activity within the greater Ōtaki area. This activity is Gross Output of \$32.8 million, GDP of \$15.1 million and employment of 118 FTEs.

The next section explores various scenarios that show the potential additional economic value from expanding the areas of high-value production. This expansion can achieve the scale necessary to capture some of the outside-based servicing activity within the greater Ōtaki area.

4 Scenarios of Potential rural productive value

This section develops scenarios that will inform KCDC on the potential value of rural productive land in the greater Otaki area, and the level of effort and resource KCDC should commit to develop these scenarios.

4.1 Scenarios assessed

The scenarios to be assessed will describe the changes to present land use that could be achieved by 2030 to realise the potential value to the economy of the area.

4.1.1 Purpose of scenarios

The purpose of the scenarios is to illustrate feasible and credible changes in the profile of future land use in the area in 2030, and then to assess the direct and indirect impacts of those scenarios on the economy in the Greater Ōtaki area.

4.1.2 Range of scenarios

We wish to show a range of scenarios as follows:

1. A conservative estimate of how a gradual trend change in land use may look in a snapshot in 2030. This is represented by the scenario developed in the 2005 report by Mackay, Clothier et.al. from a number of CRIs⁵, and referred to above. We shall refer to this as the '2005 CRI scenario'.
2. We then show a scenario which approximately represents the maximum potential value from rural land if all land suitable for horticulture was in horticultural production. This is the Upper Bound scenario. In the 2005 CRI report, the team used the SLURI Decision Tree, which judged 6,701 hectares of land to be suitable for different combinations of horticultural use. The Upper Bound scenario transfers 6,701 hectares from other uses, including part of the Lifestyle blocks, to these horticultural uses.
3. The third scenario tests an ambitious 'horticulture stretch' scenario that would see rural land use change in the greater Ōtaki area to achieve 3,000 hectares in horticulture. This increase would make the greater Ōtaki area a substantial producer and we would expect local processing would develop.

⁵ A CRI is a Crown Research Institute, and the CRI staff contributing to the 2005 report were from AgResearch, Hort Research, Landcare Research, and Crop and Food Research. A staff member from private company PGG Wrightson Consulting also contributed.

4. A fourth scenario for which we give an outline concept, is a development from the 'horticultural stretch' scenario, where the horticulture and processing in rural Greater Ōtaki are integrated into a 'fine food overnight visitor experience' offered to residents of the Wellington and Manawatu regions, and to 'interactive' tourists from further afield.

4.2 Scenario 1: The 2005 CRI scenario

The 2005 research concentrated on horticultural production and developed 'A simple scenario to show one option for increasing the land in horticultural activities by 50%, taking it from 672 hectares to 1,009 hectares'. The 2005 CRI report team used the SLURI⁶ Decision Tree and determined that the potential land area suitable for different combinations of horticulture crop production was 6,701 hectares, as shown by Table 4.1 below.

Table 4.1: 2005 CRI scenario economic value rural land 2030

Crop	Current	All Crops	Berry fruit	BFMN*	MBN*	OVP*	OV*	Total
Potential	672	2129	649	708	273	1215	1725	6701
Nursery	35				53			53
Flowers	25			38				38
Berryfruit	27		40					40
Vegetables	230			125	220			345
Pipfruit	83					125		125
Viticulture	42						63	63
Olives	127						190	190
Other Hort	104	156						156
Amount used	673	156	40	163	273	125	253	1010

Source: 2005 CRI report

* B = Berry fruit, F = Flowers, M = Market gardening, N = Nurseries, O = Olives,
P = Pipfruit, V = Viticulture

Although there is the potential to increase horticultural land from 672 hectares to 6701 hectares, the CRI scenario used a very conservative, almost Business as Usual (BAU) scenario of utilising just 1,010 hectares in 2030. That is, increasing horticultural activities by 50 percent from 672 hectares to 1,010 hectares. Table 4.1 shows the land use under a BAU scenario, where the 1,010 hectares of land is shared amongst the land uses in the same proportions as the present 670 hectares in horticultural production.

To reflect the change in land-use to the greater Ōtaki area, the increase in horticultural land is assumed to come from land currently used by the sheep, beef, and cropping; and dairy

⁶ SLURI: Sustainable Land Use Research Initiative of these CRIs.

The light yellow area represents the amount of land in dairy, the red area represents land in beef, the white spotted areas represent the area in Sheep and the light purple area represents arable cropping.

4.2.1 2005 CRI Scenario results – direct impact

Table 4.2 shows the direct impact of increasing horticultural activities from 672 hectares to 1009 hectares (50%).

Table 4.2: 2005 CRI Scenario results – direct impact in 2030

Land Use	Area	Direct Impact			
		Gross Output	Value Added	Employment (FTEs)	
	(ha)	(\$mn)	(\$mn)	Otaki In region	Rest of NZ
Urban	945				
Peri Urban	1,645	\$0.66	\$0.2	2	
Primary industry					
Horticulture	1,010	\$21.2	\$9.5	178	0
Sheep, beef and cropping	1,755	\$1.7	\$0.6	9	4
Dairy and cattle farming	3,990	\$18.3	\$7.9	102	20
Other farming	1,400	\$0.8	\$0.2	5	0
Forest plantation	1,706	\$2.4	\$0.7	6	0
Total Primary industry	9,861	\$44.5	\$19.0	299	25
Conservation etc.	27,625				
TOTAL	40,076	\$45.2	\$19.2	301	25
Increase from present	Number	\$5.7	\$2.6	51	-2
	%	14%	15%	21%	-6%

Sources: BERL database and numerous.

Increasing horticultural land by 337 hectares increases Gross Output to \$45.2 million, Value Added (GDP) to \$19.2 million and FTEs to 301 in the greater Ōtaki area. In comparison with the current situation, Gross Output increased by \$5.7 million (14%), GDP increased by \$2.6 million (15%), and FTEs increased by 51 (21%).

FTEs for New Zealand have declined by 2 (6%). This means that the greater Ōtaki area has not only gained jobs that were usually outside of the Ōtaki area, but also that new jobs have been created. This increase in jobs is due to the increase in economic activity within the area due to its increased production of horticultural crops.

4.2.2 2005 CRI Scenario results – total impact

The total impact of increasing horticultural activities by 337 hectares is presented in Table 4.3 below. This is the total impact including the indirect and induced impacts.

Table 4.3: 2005 CRI Scenario results – Total impacts in 2030

Land Use	Area	Total Impacts					
		Gross Output (\$mn)		Value Added (\$mn)		Employment (FTEs)	
		<i>Otaki In region</i>	<i>Rest NZ</i>	<i>Otaki In region</i>	<i>Rest NZ</i>	<i>Otaki In region</i>	<i>Rest NZ</i>
	<i>(ha)</i>						
Urban	945						
Peri Urban	1,645	\$1.1					
Primary industry							
Horticulture	1,010	\$34.0	\$18.5	\$15.1	\$8.8	267	73
Sheep, beef and cropping	1,755	\$3.1	\$1.5	\$1.3	\$0.6	18	1
Dairy and cattle farming	3,990	\$29.3	\$14.5	\$12.7	\$6.6	164	51
Other farming	1,400	\$1.4	\$0.8	\$0.5	\$0.4	8	4
Forest plantation	1,706	\$3.8	\$2.6	\$1.5	\$1.1	16	9
Total Primary industry	9,861	\$71.6	\$37.9	\$31.1	\$17.5	472	139
Conservation etc.	27,625						
TOTAL	40,076	\$72.7	\$37.9	\$31.1	\$17.5	472	139
Increase from present	Number	\$9.1	\$5.0	\$4.1	\$2.4	76	21
	%	14%	15%	15%	16%	19%	18%

Sources: BERL database and numerous.

The impact of increasing horticultural activities in the greater Ōtaki area results in total impacts of \$72.7 million in Gross Output, \$31.1 million in GDP and 472 FTEs. In comparison with current land-use of 672 hectares, Gross Output has increased by 9.1 million (14%), GDP by \$4.1 million (15%) and FTEs by 75 (19%).

Increasing horticultural activities in the greater Ōtaki area will also increase Gross Output, GDP and Employment throughout the rest of New Zealand.

4.3 Scenario 2: Horticulture Upper Bound scenario

This Upper Bound scenario aims to approximately represent the maximum potential value from rural land if all land suitable for horticulture was in horticultural production. In the 2005 CRI report the team used the SLURI Decision Tree, which judged 6,701 hectares of land to be suitable for different combinations of horticultural use. The Upper Bound scenario transfers 6,031 hectares from other uses, including part of the Lifestyle blocks, to these a combination of horticultural uses that reflects the SLURI pattern. The pattern we model does not purport to be the optimum pattern of land use in 2030. Even if we were able to assess in detail the optimum specific use for each piece of land now, which even SLURI did not attempt to do, we can be certain that there will be considerable change by 2030 in horticultural product markets, production technologies and thus relative profitability. Thus the optimum land use in 2030 is not known now.

4.3.1 Scale of dynamic land use in New Zealand horticulture

The maximum potential area in horticulture in the greater Ōtaki area has been judged at 6,701 hectares, and this compares with national figures for the major areas of horticulture in recent years of about 40,000 hectares of field vegetables and about 68,000 hectares of fruit orchards, including vineyards. As with the present Ōtaki pattern, and the national picture, it is likely that horticultural land use in Ōtaki in future will be predominantly field vegetables and fruit orchards.

The 6,700 hectares potential for horticulture in the Ōtaki area would be a substantial but not inordinately large share of this 108,000 hectares nationally. The 108,000 hectares recorded in 2009 had increased from an area of 86,000 hectares recorded in 1990, an increase by 22,000 hectares in 19 years. It is therefore conceivable that horticulture in the area in Ōtaki could expand towards the potential of 6,700 hectares over the coming 19 years to 2030, within the context of continuing New Zealand horticulture crop expansion.

The scale of land use in field vegetables has been relatively stable at 40,000 hectares a year since 1990, and the fruit orchards were stable at about 46,000 hectares from 1990 to 1996, then increased steadily to 68,000 hectares by 2009. The areas grown in individual specific horticulture crops, however have been anything but stable or steady in their growth over the period.

The main field vegetable crops (by area) in 2009 were potatoes, squash, peas (fresh and process), sweetcorn, onions, broccoli, and lettuce. These seven accounted for 37,000 of the 40,000 hectares in field vegetables in 2009. All of these except peas had increased since 1990, but other previously large crops of asparagus, outdoor tomatoes, cabbage, cauliflower and green beans had reduced considerably.

A similar picture emerges for orchard fruit. The main orchard fruit crops (by area) in 2009 were wine-grapes, kiwifruit, apples, avocados, olives and blackcurrants. These six accounted for 61,000 of the 68,000 hectares in orchard fruit in 2009. Three of these had increased substantially since 1990, namely winegrapes (500%+), avocados (200%+), and blackcurrants (80%). The other three had declined, kiwifruit 24%, apples 18% since 1990, and olives had declined since 2002. Most other fruits had declined, and this list includes boysenberries, pears (including Nashi), peaches, apricots, nectarines, feijoas, tamarillos, passionfruit, persimmons, oranges, grapefruit, tangelos, strawberries and raspberries. The total area in these fifteen crops had more than halved from 8,200 hectares in 1990 to under 4,000 hectares in 2009.

The pattern of land use in horticultural crops is therefore dynamic over time. This means that it is difficult, if not impossible to forecast the likely pattern of crop production in New

Zealand in 2030. However it also means that as markets and production technologies for different crops change over time, there will be opportunities for the Ōtaki area to enter into or expand areas of production of the favourable crops in the period from now to 2030.

4.3.2 Upper Bound scenario land use pattern

For this scenario we had to make judgement calls about the present land uses of the 6,031 additional hectares transferred to horticulture to increase horticulture from the present 670 hectares, to 6,701 hectares.

We have assumed that some of the land suitable for horticulture is at present in lifestyle blocks. Otherwise, horticulture is assumed to be feasible on much of the land in all other agricultural and pastoral uses. The actual pattern of land use modelled is shown below.

Table 4.4: Horticulture Upper Bound scenario land use

Land Use	Area
	<i>(ha)</i>
Urban	945
Peri Urban	1,042
Primary industry	
Horticulture	6,701
Sheep, beef and cropping	517
Dairy and cattle farming	1,145
Other farming	395
Forest plantation	1,706
Total Primary industry	10,464
Conservation etc.	27,625
TOTAL	40,075

Sources: BERL database and numerous.

4.3.3 Upper Bound pattern of horticulture land use

The 2005 research reported on the SLURI allocation of 6,701 hectares of land into combination groupings as follows:

Berry fruit	649
Berries, flowers, market garden, nurseries	708
Market garden, berries, nurseries	273
Olives, viticulture, pipfruit	1,216
Olives, viticulture	1,725

All crops	2,130
Total	6,701

Within these combinations we allocated the areas to specific crops, largely reflecting the present pattern of land use, and particularly allocating significant areas to the general classifications 'other horticulture' and Other planted fruit types, including olives. These areas are likely to be utilised by emerging future crops.

The consequent detailed horticultural land use shows a shift in emphasis from field vegetables to permanent orchard crops. This reflects also the national pattern over the last 19 years.

Table 4.5: Horticulture Upper Bound horticultural land use

Horticulture crop types	Area	
	(ha)	(%)
Nursery	59	0.15%
Cut flowers	8	0.02%
Vegetables	631	1.57%
Horticulture (other)	642	1.60%
Annual	1,339	3.34%
Fruit growing (pipfruit)	579	1.45%
Fruit growing (berries)	1,050	2.62%
Viticulture	681	1.70%
Other planted types (plus Olives)	2,734	6.82%
Permanent	5,045	12.59%
Total Horticulture	6,701	16.72%

Sources: BERL database and numerous.

The total share of land shown (16.7%) is the share of the total land recorded in the 2005 report.

4.3.4 Shape of the land use economy with Upper Bound horticulture

If the District was utilising all possible land in horticulture, there would be well-developed servicing industries in the Ōtaki area, and so much less of these production costs would be spent outside the area. In other words the multipliers of activity generated by this horticultural production would be more similar to those in regions with substantial horticultural production, like Canterbury and Hawke's Bay. We have made these adjustments, and an indication of the land use economy with 6,701 hectares applied to horticulture in the above pattern is shown below.

Table 4.6: Horticulture Upper Bound direct impact

Land Use	Area	Direct Impact			
		Gross Output	Value Added	Employment (FTEs)	
	(ha)	(\$mn)	(\$mn)	Otaki In region	Rest of NZ
Urban	945				
Peri Urban	1,042	\$0.42	\$0.1	1	
Primary industry					
Horticulture	6,701	\$119.4	\$53.1	999	0
Sheep, beef and cropping	517	\$0.5	\$0.2	3	1
Dairy and cattle farming	1,145	\$5.3	\$2.3	30	6
Other farming	395	\$0.2	\$0.1	1	0
Forest plantation	1,706	\$2.4	\$0.7	6	0
Total Primary industry	10,464	\$127.8	\$56.4	1,039	8
Conservation etc.	27,625				
TOTAL	40,075	\$128.3	\$56.6	1,040	8
Difference from present	Number	\$88.8	\$39.9	790	-19
	%	225%	240%	316%	-71%

Sources: BERL database and numerous.

If all land possible was used in horticulture, the Gross Output (or total sales) from the land uses would be \$128 million per year, about \$88 million, or 225% more than under current land use. The GDP or value added would be about \$57 million, a figure \$40 million or 240% greater than under current land use, and direct employment in the greater Ōtaki area would be 1,040 FTEs, which is 790, or 316% more than under current land use.

4.3.5 Indirect impacts on the economy with Upper Bound horticulture

The direct impacts would feed through to the rest of the economy of in the greater Ōtaki area, through the multiplier mechanism.

The estimation indicates that if all possible land was applied to horticulture, the total impacts on the economy, including multipliers, of the Gross Output, the Value Added, and the Employment, would all be over 300% greater than they are under the current land use. This would have the Ōtaki area's total contribution to the District's GDP at \$115 million per year, compared with the present estimated contribution of \$27 million per year.

Table 4.7: Horticulture Upper Bound total impact

Land Use	Area	Total Impacts					
		Gross Output (\$mn)		Value Added (\$mn)		Employment (FTEs)	
	(ha)	Otaki In region	Rest NZ	Otaki In region	Rest NZ	Otaki In region	Rest NZ
Urban	945						
Peri Urban	1,042	\$0.7					
Primary industry							
Horticulture	6,701	\$244.7	\$50.0	\$108.9	\$25.5	1,699	211
Sheep, beef and cropping	517	\$0.9	\$0.4	\$0.4	\$0.2	5	0
Dairy and cattle farming	1,145	\$8.5	\$4.2	\$3.7	\$1.9	48	15
Other farming	395	\$0.4	\$0.2	\$0.1	\$0.1	2	1
Forest plantation	1,706	\$3.8	\$2.6	\$1.5	\$1.1	16	9
Total Primary industry	10,464	\$258.4	\$57.5	\$114.6	\$28.8	1,770	236
Conservation etc.	27,625						
TOTAL	40,075	\$259.1	\$57.5	\$114.6	\$28.8	1,770	236
Difference from present	Number	\$195.5	\$24.7	\$87.6	\$13.7	1,374	119
	%	307%	75%	324%	91%	347%	101%

The fact that full utilisation of all horticultural land would result in a very significantly larger economy provides stimulus to draw up a scenario with a reasonably large, but probably achievable utilisation of about one-half of the possible horticultural land. This is now explored in a Horticulture Stretch scenario.

4.4 Scenario 3: Horticulture Stretch scenario

This Horticulture Stretch scenario explores the pragmatic possibility of expanding horticultural land use towards its horticultural maximum by 2030. As shown above, the 2005 CRI report team determined that the potential land area suitable for different combinations of horticulture crop production was 6,701 hectares, and the 2011 report at Page 86 repeated this estimate of 6,701 hectares and said that with small parcels of land removed, the appropriate area is 4,727 hectares.

We have explored and assessed changes in horticultural crop production over the years as reported in section 4.3.1 above. On the basis of this assessment, and to be relatively conservative, we have assumed that 3,000 hectares of land would be in horticultural production in the Greater Ōtaki area by 2030. The scale of production would then be such that some of the production would be processed within the area.

The pattern of production in different crops will be dependent upon a whole range of factors, especially the availability and strength of markets, local and external, and of profitable production technologies. With the more intensive forms of horticultural production it is probable that some crops will require irrigation.

It is beyond the scope of this study to investigate the crop needs, and the availability of water for irrigation of different crops. However there is information available publicly at the Regional Council level.⁷ This information indicates that for the Greater Wellington Regional Council, water consented for irrigation is 133 million m³ per year. The actual water use for irrigation 2009-10 was 28 million m³, or just 21% of the consented volume. The accompanying map in the report indicates that a significant proportion of the GWRC irrigation consents are in the Kapiti / Ōtaki area. It would appear from this information that additional water could be available for irrigation of horticultural crops in the Ōtaki area.

4.4.1 Horticulture Stretch scenario land use pattern

The 3,000 hectares is a combination of horticultural crops currently produced in the greater Ōtaki area. We have assumed that the total area of 3,000 hectares of land comes from horticulture (670 hectares), with the additional 2,330 hectares being split evenly between general sheep, beef and cropping, dairy, and a small amount from the lifestyle land use. The land use changes for this scenario are displayed in Table 4.8 below.

Table 4.8: Horticulture Stretch scenario land use change by 2030

Land Use	Area
	(ha)
Urban	945
Peri Urban	1,545
Primary industry	
Horticulture	3,000
Sheep, beef and cropping	810
Dairy and cattle farming	3,045
Other farming	1,400
Forest plantation	1,706
Total Primary industry	9,961
Conservation etc.	27,625
TOTAL	40,076

Sources: BERL database and numerous.

The detailed horticultural land uses, and the assessed gross output or sales from each activity are shown below.

⁷ Update of water allocation data and estimate of actual water use and consented takes 2009-10. Aqualinc, for Ministry of Environment, Wellington. October 2010.

Table 4.9: Horticulture Stretch horticulture land use 2030

Horticulture crop types	Area		Gross Output or 'Sales'
	(ha)	(%)	(\$'000)
Nursery	60	0.15%	\$1,493.0
Cut flowers	11	0.03%	\$279.9
Vegetables	642	1.60%	\$18,453.4
Horticulture (other)	653	1.63%	\$8,619.5
Annual	1,366	3.41%	\$28,845.8
Fruit growing (pipfruit)	336		\$14,372.9
Fruit growing (berries)	600	1.50%	\$17,805.0
Viticulture	187	0.47%	\$2,143.6
Other planted types (plus Olives)	511	1.28%	\$5,113.5
Permanent	1,634	4.08%	\$39,435.0
Total Horticulture	3,000	7.49%	\$68,280.8

Sources: BERL and numerous.

4.4.2 Horticulture Stretch land use economy

An appropriate multiplier has been applied to assess the impact of this scenario's land-use combination in the greater Ōtaki area. We have adjusted the multiplier from one that is from a low multiplier region with a relatively small horticulture sector, like Wairarapa, to a multiplier which is between that of two major processing areas such as Manawatu and Canterbury. The direct impact of Scenario 2 is shown in Table 4.10 below.

Table 4.10: Horticulture Stretch direct impacts 2030

Land Use	Area	Direct Impact			
		Gross Output	Value Added	Employment (FTEs)	
				(\$mn)	(\$mn)
	(ha)				
Urban	945				
Peri Urban	1,545	\$0.62	\$0.2	2	
Primary industry					
Horticulture	3,000	\$68.3	\$30.4	572	0
Sheep, beef and cropping	810	\$0.8	\$0.3	4	2
Dairy and cattle farming	3,045	\$12.6	\$5.5	70	14
Other farming	1,400	\$0.8	\$0.2	5	0
Forest plantation	1,706	\$2.4	\$0.7	6	0
Total Primary industry	9,961	\$84.9	\$37.1	657	16
Conservation etc.	27,625				
TOTAL	40,076	\$85.5	\$37.3	658	16
Increase from present	Number	\$46.0	\$20.7	408	-10
	%	117%	124%	163%	-38%

Sources: BERL database and numerous.

The direct impact of increasing horticultural activities to 3000 hectares in the greater Ōtaki area results in \$85.5 million in Gross Output, \$37.3 million in GDP and 658 FTEs. In comparison with the current situation, Gross Output increased by \$46 million (116%), and GDP increased by \$20.7 million (124%).

FTEs also increased by 408 (163%), however at the same time, FTEs for New Zealand has declined by 10 (38%). This means that the greater Ōtaki area has not only gained jobs that were usually outside of the Ōtaki area, but also that new jobs have been created. This increase in jobs is due to the increase in economic activity within the Ōtaki due to its increased production and some processing of horticultural crops.

4.4.3 Horticulture Stretch total impacts 2030

Table 4.11 shows the total impacts of increasing horticultural activities in the greater Ōtaki area.

Table 4.11: Horticulture Stretch total impacts 2030

Land Use	Area	Total Impacts					
		Gross Output (\$mn)		Value Added (\$mn)		Employment (FTEs)	
		<i>Otaki In region</i>	<i>Rest NZ</i>	<i>Otaki In region</i>	<i>Rest NZ</i>	<i>Otaki In region</i>	<i>Rest NZ</i>
	<i>(ha)</i>						
Urban	945						
Peri Urban	1,545	\$1.0					
Primary industry							
Horticulture	3,000	\$133.1	\$35.4	\$60.8	\$16.1	943	149
Sheep, beef and cropping	810	\$1.4	\$0.7	\$0.6	\$0.3	8	1
Dairy and cattle farming	3,045	\$20.1	\$9.9	\$8.7	\$4.6	113	35
Other farming	1,400	\$1.4	\$0.8	\$0.5	\$0.4	8	4
Forest plantation	1,706	\$3.8	\$2.6	\$1.5	\$1.1	16	9
Total Primary industry	9,961	\$159.9	\$49.5	\$72.1	\$22.4	1,087	198
Conservation etc.	27,625						
TOTAL	40,076	\$160.9	\$49.5	\$72.1	\$22.4	1,087	198
Increase from present	Number	\$97.4	\$16.7	\$45.1	\$7.3	691	80
	%	153%	51%	167%	48%	174%	68%

Sources: BERL database and numerous.

The total impact of increasing horticultural activities to 3000 hectares results in Gross Output of \$160.9 million, GDP of \$72.1 million, and 1,087 FTEs.

In comparison with the current situation, Gross Output increased by \$97.4 million (153%), GDP increased by \$45.1 million (167%), and FTEs increased by 691 (174%).

4.5 Scenario 4: Ōtaki Fine Food Destination scenario

This scenario is by way of exploration of a concept as to whether or not it may be feasible to generate a Fine Food Destination in the Greater Ōtaki area as additional value adding to the horticultural development explored in the other three scenarios.

The general concept is that there would be local processing in a range of scales, and visitor accommodation and Fine Food activities to complement the fresh food production. The area would offer a 'fine food overnight visitor experience' to residents of Wellington and Manawatu regions, and to 'interactive' tourists from further afield. The approach would be developed consistent with other aspects of KCDC's strategic direction, including respecting environmental, social and cultural impacts.

The basis of this development would be the principle of responsible tourism. Responsible tourism is about respecting, protecting and benefiting local communities, cultures and the environment. For travellers, this can mean making holiday choices with these concerns in mind, from the destinations they visit and the way they travel, to the services they choose once they arrive. The nature of the accommodation, attractions and activities developed by the Ōtaki land owners, entrepreneurs, and community should be attractive to the people who would make these responsible choices.

4.5.1 Ōtaki Fine Food Destination Concept

The concept is that a range of Fine Food activities, attractions and hospitality options could be integrated with the development of a range of horticulture production and processing options in the area. It can be expected that with larger areas in production of high-value horticultural crops in the Horticulture Stretch scenario there will be a significant range of processing at different scales around the Greater Ōtaki area. Some of this processing activity will attract an expansion of the hospitality industry, and that this will generally be spread around the area, probably in pockets, or 'hamlets'.

There are precedents elsewhere in the country where in the first instance horticultural processing has assisted a small settlement to become a 'must-visit' destination for through travellers, and in the second instance horticultural product and food has become an attraction to overnight visitors from a nearby city. The concept we recommend for Ōtaki combines these two precedents.

The first example we mention is Geraldine in South Canterbury, which previously was off the routes from the north and Christchurch, to the southern lakes, and/or Dunedin. The fruit processing family Barkers have given travellers a reason to visit Geraldine and see where their fine jams and other products are made.

The second example is Martinborough which previously had one tired hotel, but with the initiative of four local-residents to designate a wine-growing appellation area, based on a 1979 DSIR report, has become a quality wine-producer. Vineyards have flourished and many have diversified into hospitality, creating an attraction for weekend visitors from nearby Wellington, and places further afield.

4.5.2 *Geraldine and the Fine Food processing component*

Barkers fruit processing and their widely-marketed line of jams and other quality food products has identified itself closely with Geraldine, since its establishment in 1969. The well-known brand has generated interest in the town of Geraldine. Travellers from North Island now increasingly leave SH1 at Woodend in North Canterbury and take SH72 along the Canterbury foothills through Oxford, Mount Hutt and thence to Geraldine to visit and sample at Barkers. They then either re-join SH1 near Temuka and head south, or go inland to Fairlie, the Mackenzie Country and the southern lakes.

Barkers itself may not create a large amount of employment for Geraldine and the region (they directly employ 120 fulltime equivalent workers) and their contribution to Canterbury Region's GDP would not be substantial. However they have given Geraldine an identity perhaps similar to the earlier L&P and Paeroa. Incidentally the increasing reputation has grown the Barkers' family business to acquire the Anathoth jam business and to develop the Tandoori Palace range of Indian simmer sauces. Barkers have also become a secure outlet for growers of berries and other fruits on orchards and lifestyle blocks in the South Canterbury region.

4.5.3 *Martinborough and the Fine Food Destination hospitality component*

The second precedent which could indicate the feasibility of this broadening of the land-based economy of the Ōtaki area is the development of Martinborough and surrounding areas in the Wairarapa as a weekend 'wine and food' destination. As well it is a destination for a number of events attractive to the weekend overnight traveller from Wellington. These events include the specific Toast Martinborough wine and food festival, as well as musical concerts, cycle challenges and the like.

The initiatives being developed relative to the Ōtaki area including the Kapiti Arts Trail will be synergistic with such hospitality developments.

There is not a direct comparison possible between the two areas, but the history of Martinborough is illustrative. The first quality B&Bs in Martinborough came into the market in the late 1980s. Since then a range of accommodation types have developed, many of them of the 'holiday home' or 'book-a-bach' type. Many are owned by local residents while others

have been purchased and renovated for leasing out by Wellingtonians, and yet others are on lifestyle blocks or vineyards.

We estimate that at present there are over 110 accommodation units of different types in Martinborough and the immediate surrounds. The comparison with the situation in the Ōtaki area, with about 60 accommodation units, is one of scale rather than a fundamental difference.

Table 4.12: Hospitality accommodation Ōtaki and Martinborough

Accommodation types	Otaki Te Horo area	Martinborough and surrounds
	<i>Approximate numbers</i>	
Holiday homes and baches to let	26	50
Bed and breakfast	2	6
Motel units	35	55
Total	63	111

Sources: AATravel and other websites.

The simple profile of the approximate portfolio of hospitality accommodation in the two areas indicates that the generation of a Fine Food attraction to the Ōtaki area could well expand the accommodation and broader hospitality industry in the area without creating a major change to the present pattern of the communities.

4.5.4 Potential players in the Fine Food Destination developments

The present horticultural producers and processors in the area are obvious potential players in the development of hospitality in the area. A second potential group of investors and business developers are those on lifestyle blocks in the area.

Like Martinborough and the broader Wairarapa, the Greater Ōtaki area has a substantial number of lifestyle block families. In the Ōtaki area in 1995, there were 565 lifestyle blocks of about 4 hectares, and by 2009 this had increased to 941 lifestyle blocks. There was significant capital gain over this period, from a capital value of about \$170,000 each in 1995 to \$575,000 each in 2009.

Clearly those who were in the group of 565 owners of lifestyle blocks in 1995, and who were still there in 2009 will have significant equity from this capital gain. This can enable them to

take up opportunities in horticulture developments, in small-scale processing and in hospitality and tourism assets and activities.

There is an interesting comparison of the track of land values per hectare on lifestyle blocks in Ōtaki and the Martinborough area between 1995 and 2009. In 1995 the land value in both areas was about \$20,000 per hectare. By 2009 in Martinborough, with the expansion of horticultural and hospitality activities in the area, the lifestyle blocks had land values of over \$170,000 per hectare, whereas in Ōtaki they were just \$90,000 per hectare. This could be seen by those on lifestyle blocks in Ōtaki as a performance worth emulating.

4.5.5 *Complementarity of hospitality with horticulture and processing*

These conceptual considerations indicate that it would be worthwhile investigating in more detail the potential shape that the development of the Ōtaki area would take.

5 Conclusions

The rural land uses in the Ōtaki area, we estimate generate directly and indirectly a total of \$27 million GDP per year, and employ 396 Fulltime Equivalents (FTEs). The highest value produced per hectare is from horticulture uses. If the economic value from rural land use is to be increased, this implies that the area in horticulture will have to be increased.

The present area of land in horticulture is 670 hectares, and the total area of land that could possibly support horticultural production has been estimated at 6,701 hectares. If there was 6,701 hectares in horticulture, this defines the Upper Bound of the impact on the economy from rural land use in the Ōtaki area. We have estimated this maximum total contribution to the economy at GDP of \$115 million per year, and a total employment of 1,770 FTEs. This is more than a 300% increase on the present contribution.

In New Zealand as a whole, there is ongoing expansion of the area of land in horticulture, with an ever-changing crop mix. This dynamic situation presents an opportunity for landowners in the Ōtaki area to be able to grow an increasing area of existing and new crops, now, and this situation is expected to continue in future. We therefore conclude that it would be feasible for the Ōtaki growers to expand their areas in horticulture from 760 hectares now to 3,000 hectares in 2030. A realistic pattern of horticulture crops within that 3,000 hectares would result in rural land contributing a total of \$72 million to the GDP of the Ōtaki area per year, and employment of 691 FTEs.

These analyses lead to a conclusion that it would be advantageous to the area's economy to encourage and facilitate the expansion of horticultural land use in the Ōtaki area.

We also explore the concept of generating a Fine Food Destination in the Greater Ōtaki area as additional value adding to the horticultural development. We conclude that elements of this concept have been shown to be feasible, advantageous and valuable in other areas in New Zealand. This concept could profitably be developed further to broaden the strength of the economy and communities in the Ōtaki area.

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7 Appendix: Multiplier Analysis

This multiplier analysis uses multipliers derived from inter-industry input-output tables. These input-output tables are purchased from Butcher Partners, Canterbury – a recognised source for regional input-output tables and multipliers.

Multipliers allowed us to identify the direct, indirect and induced effects in terms of output (GDP) and Full Time Equivalent (FTE) employment.

7.1 Measures

7.1.1 Gross Output Multipliers

Gross output is the value of production, built up through the national accounts as a measure, in most industries, of gross sales or turnover. This is expressed in \$ million at constant prices. Gross output is made up of the sum of:

- compensation of employees (i.e. salaries and wages)
- income from self employment
- depreciation
- profits
- indirect taxes less subsidies
- intermediate purchases of goods (other than stock in trade)
- intermediate purchases of services.

7.1.2 Value added (GDP) multipliers

Value added multipliers measure the increase in output generated along the production chain, which, in aggregate, totals Gross Domestic Product (GDP). Value added is made up of the sum of:

- compensation of employees (i.e. salaries and wages)
- income from self employment

- depreciation
- profits
- indirect taxes less subsidies.

7.1.3 *Employment Impact multipliers*

Employment impact multipliers determine the number of FTE roles that are created for every \$1 million spent in an industry for one year. It provides a measure of total labour demand associated with Gross Output. An FTE is the percentage of time an employee works represented as a decimal. A full-time position is 1.00; a part-time position is 0.50.

7.1.4 *Direct, indirect and induced effects*

The underlying logic of multiplier analysis is relatively straightforward. An initial expenditure (direct effect) in an industry creates flows of expenditures that are magnified, or “multiplied”, as they flow on to the wider economy. This occurs in two ways:

The industry purchases materials and services from supplier firms, who in turn make further purchases from their suppliers. This generates an indirect effect.

Persons employed in the direct development and in firms supplying services earn income (mostly from wages and salaries, but also from profits) which, after tax is deducted, is then spent on consumption. There is also an allowance for some savings. These are the induced effects. Hence, for any amount spent in an area (direct effect), the actual output generated from that spend is greater once the flow on activity generated (indirect and induced effects) is taken into account.

7.2 *Limitations of multiplier analysis*

7.2.1 *Partial equilibrium analysis*

Multiplier analysis is only a “partial equilibrium” analysis, assessing the direct and indirect effects of the development being considered, without analysing the effects of the resources used on the wider national economy. In particular, it assumes that the supply of capital, productive inputs and labour can expand to meet the additional demand called forth by the initial injection and the flow on multiplier effects, without leading to resource constraints in other industries. These constraints would lead to price rises and resulting changes in overall patterns of production between industries. To assess inter-industry impacts in full would require economic modelling within a “general equilibrium” framework. Applying such models

becomes more relevant where the particular development is considered significant within the overall economy.

7.2.2 Additionality

Related to partial equilibrium, using multipliers for economic impact assessments assumes that the event is something that would not have been undertaken anyway and that it will not displace existing activity. That is, the event is additional to existing activity. If it does either of the above, then the economic impact is less than that determined by the multiplier and it would be necessary to subtract both the activity that would have occurred anyway and the displacement effect.

7.2.3 Impact

Again related to “partial equilibrium”, multiplier analysis assumes that an event will not have an impact on relative prices. However, in a dynamic environment, it can be assumed that a large event would have an impact on demand and supply and hence prices. Hence, the larger the event and the more concentrated it is in a single industry or region, the more likely it is that the multipliers would give an inaccurate analysis of impacts. For example, if multiplier analysis was used to determine the effect of residential building construction nationally it would likely be inaccurate as residential building construction accounts for over 6 percent of GDP.

7.2.4 Aggregation

Industries outlined in input output tables are aggregates of smaller sub-industries. Each sub-industry has unique inputs and outputs. The higher the level of aggregation the less accurate these inputs and outputs become. Thus, if determining the multiplier effect of a very specific event using highly aggregated data, there will be a lower level of accuracy. Similarly, if an event encompasses a range of industries and multipliers from a single industry are applied the accuracy levels will diminish.

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