

91243R



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MANA TOHU MĀTAURANGA O AOTEAROA

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## Level 2 Geography, 2017

### 91243 Apply geography concepts and skills to demonstrate understanding of a given environment

2.00 p.m. Wednesday 15 November 2017  
Credits: Four

## RESOURCE BOOKLET

Refer to this booklet to answer the questions for Geography 91243.

Check that this booklet has pages 2–12 in the correct order and that none of these pages is blank.

**YOU MAY KEEP THIS BOOKLET AT THE END OF THE EXAMINATION.**

## Relevant geographic concepts

### Environments

May be natural and / or cultural. They have particular characteristics and features which can be the result of natural and / or cultural processes. The particular characteristics of an environment may be similar to and / or different from another. A cultural environment includes people and / or the built environment.

### Perspectives

Ways of seeing the world that help explain differences in decisions about, responses to, and interactions with environments. Perspectives are bodies of thought, theories, or world views that shape people's values and have built up over time. They involve people's *perceptions* (how they view and interpret environments) and *viewpoints* (what they think) about geographic issues. Perceptions and viewpoints are influenced by people's *values* (deeply held beliefs about what is important or desirable).

### Processes

A sequence of actions, natural and / or cultural, that shape and change environments, places, and societies. Some examples of geographic processes include erosion, migration, desertification, and globalisation.

### Patterns

May be *spatial*: the arrangement of features on the earth's surface; or *temporal*: how characteristics differ over time in recognisable ways.

### Interaction

Involves elements of an environment affecting each other and being linked together. Interaction incorporates movement, flows, connections, links, and interrelationships, which work together, and may be one- or two-way interactions. Landscapes are the visible outcome of interactions. Interaction can bring about environmental change.

### Change

Involves any alteration to the natural and / or cultural environment. Change can be *spatial* and / or *temporal*. Change is a normal process in both natural and cultural environments. It occurs at varying rates, at different times, and in different places. Some changes are predictable, recurrent or cyclic, while others are unpredictable or erratic. Change can bring about further change, and some changes may be perceived as positive and others not desirable.

### Sustainability

Involves adopting ways of thinking and behaving that allow individuals, groups, and societies to meet their needs and aspirations without preventing future generations from meeting theirs. Sustainable interaction with the environment may be achieved by preventing, limiting, minimising, or correcting environmental damage to water, air, and soil, as well as considering ecosystems and problems related to waste, noise, and visual pollution.

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The resources begin on the following page.**

## BACKGROUND TO THE TONGARIRO ALPINE CROSSING

### Introduction: Where is the Tongariro Alpine Crossing and what is the issue?

The Tongariro Alpine Crossing, located in the Tongariro National Park in the central North Island, is one of New Zealand's Great Walks. The eight-hour, 19.4 km alpine walk follows the Mangatepopo Valley, then climbs the side of Mt Ngauruhoe, and traverses Mt Tongariro. Both Ngauruhoe and Tongariro are active volcanoes, and they offer spectacular sights and views, making the walk popular with both New Zealanders and international tourists (who account for 76% of walkers).

Mt Ngauruhoe was featured as "Mt Doom" in the Hobbit films, and this has made the walk increasingly well-known and popular with international tourists. In the 2016 / 17 summer season, over 130 000 walkers completed the Tongariro Alpine Crossing.

As well as the walk being a highlight for tourists, it has created a thriving tourist industry providing accommodation and transport jobs, and growth in small nearby settlements such as National Park Village, which would otherwise have been in decline.

However, the increase in the number of walkers has also created a number of problems, as the track's capacity is exceeded, and this results in a variety of environmental problems.



Location of the Tongariro Alpine Crossing

View from Red Crater summit looking northwards towards the Emerald Lakes (small explosive craters)



View from Blue Lake looking south towards the Red Crater summit (foreground) and Mt Ngauruhoe (background)

Congestion on the track climbing towards the Red Crater summit

## **THE SETTING OF THE TONGARIRO ALPINE CROSSING**

**Resource A: An aerial oblique photograph of the Mangatepopo Valley**



**Resource B: Topographic map of the Tongariro Crossing region, and the Mangatepopo Valley showing the area of the view in the photograph in Resource A**



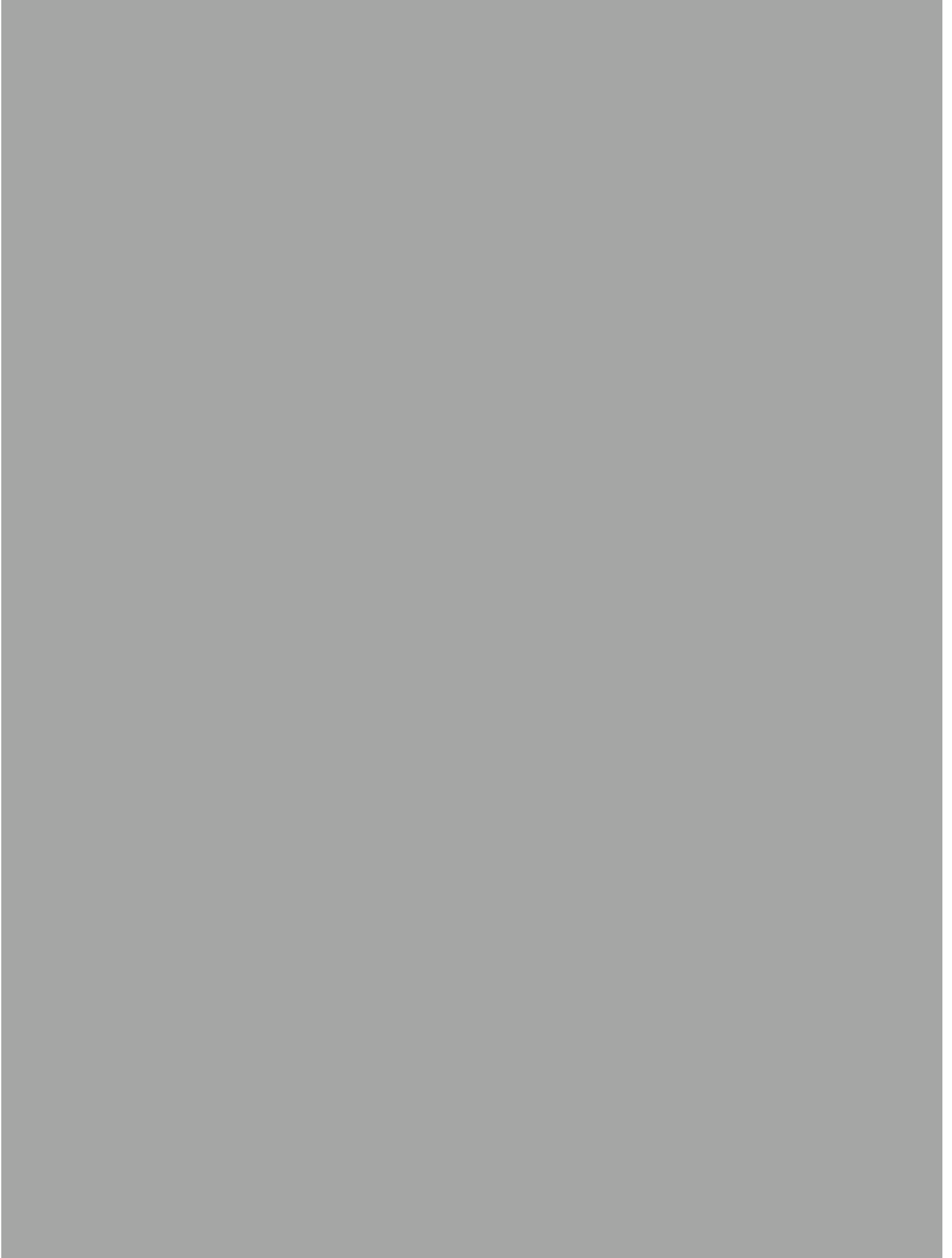
## THE NATURAL AND CULTURAL FEATURES OF THE TONGARIRO ALPINE CROSSING

### Resource C: GPS distance and altitude readings from the Tongariro Alpine Crossing

Distance (km from start)	Altitude (metres above sea level)	Feature
0	1100	Mangatepopo Car Park shelter
1.8	1150	Mangatepopo Hut
4.7	1350	Soda Springs Toilets
6.2	1650	South Crater (western side)
7.0	1650	South Crater (eastern side)
8.0	1886	Red Crater and summit
9.0	1730	Emerald Lakes (small explosive vents)
10.5	1725	Blue Lake (volcanic crater)
13.0	1450	Ketetahi Hut
19.4	800	Ketetahi Car Park

### Resource D: Map showing the main features of the Tongariro Alpine Crossing



**Resource E: Tourists' photos from the Tongariro Alpine Crossing**

## TONGARIRO ALPINE CROSSING AND CHANGE

### Resource F: The impact of increased numbers of tourists



Park Hotel National Park Village offers accommodation, a restaurant, and transport

The number of walkers completing the Tongariro Alpine Crossing has increased in recent years, from 20 000 in 1992, to over 130 000 in 2016. Approximately 76 % of walkers are international tourists.

With the increase in the number of walkers, there has been an increase in demand for accommodation, restaurants, transport providers, and guides. This has affected National Park Village, which has gone from a town in decline to one of growth, as tourism has now become the town's main industry and there is accommodation for 1 500 visitors.

As many tourists stay for more than a few nights, there has been an increased demand in other activities, such as mountain biking and kayaking on the Whanganui River. Accommodation, transport to and from the crossing, and other tourist activities, now bring \$25 million a year to the Tongariro Region.

The increase in people walking the Crossing has also brought problems related to overcrowding and congestion. Last year, on 55 % of days during the summer season, there were more than 600 visitors on the crossing, which is considered to be the ideal capacity of the track; on three days, there were more than 2 000 walkers. This increase in walkers has created a number of problems.

The Tongariro Alpine Crossing environment is very fragile. Due to the extreme climate and frequent ash falls, vegetation such as bristle tussock, is prone to trampling, and as the soils are unconsolidated volcanic ash, erosion is severe. When the vegetation cover is disturbed, the soils are very susceptible to severe rain and wind erosion.

With crowds of people at key points, there is the loss of the "wilderness experience", resulting in negative comments on tourist websites such as Trip Advisor. This is creating a negative perception of the walk, and puts the future value of the walk at risk.



Congestion point on the crossing



Vehicles parked four kilometres along the road, blocking access for buses

Another problem is parking congestion, especially at the Mangatepopo Car Park at the start of the walk. More car parks have been provided, which has had an increasingly negative effect on both the natural environment, and the perception of the crossing as a "wilderness experience".

The increase in numbers of walkers has also put pressure on toilet facilities on the walk, which cannot cope. This has led to people defecating (toileting) in the open, which is offensive to the tapu status of the mountains, and leaves undesirable and unsightly litter.



## NATIONAL PARK VILLAGE

### Resource G: Location of National Park Village



Location of National Park Village

National Park Village with Mt Ruapehu (background)

### Resource H: Employment by industry sector for National Park Village, Rotorua, and New Zealand

	National Park Village		Rotorua	New Zealand (total population)
Industry sector	Employees			
	(numbers)	(%)	(%)	(%)
Accommodation and food services	130	40.6	11.2	6.9
Recreation services (e.g. guides, transport)	75	23.4	5.3	1.2
Retail trade	6	1.9	9.9	10.1
Agriculture, forestry, and farming	55	17.2	12.7	7.7

## PERSPECTIVES ON THE INCREASE IN THE NUMBER OF WALKERS ON THE TONGARIRO ALPINE CROSSING

### Resource I: Viewpoints on the number of walkers on the Tongariro Alpine Crossing

The increased numbers of tourists has placed considerable pressure on the environment. The Mount Tongariro environment is very active and fragile, due to the harsh climate and significant volcanic activity every ten years or so. The soils are susceptible to wind and rain erosion, as they are unconsolidated volcanic ash and rock. The vegetation is easily damaged, as it is very fragile, especially to being walked upon. Plants have difficulty establishing themselves in the young, infertile, unconsolidated soils, and suffer from extreme temperatures associated with snow and ice for much of the winter, and high temperatures of 30°C or more, in the summer. At higher altitudes – above 1800 metres – there is no plant life, leaving the soils very susceptible to erosion by walkers. Erosion and washouts are common on the crossing, and boardwalks built in the Mangatepopo Valley to protect the environment, are not possible at higher altitudes. Many tourists do not appreciate the precious natural and fragile state of the Tongariro environment. In many instances, walkers leave the defined tracks to take photographs, trampling and killing vegetation, and leaving their routes prone to erosion. Besides leaving or dropping rubbish and toileting in the open, many tourists create **stone cairns** (see image above showing a ranger with volunteers dismantling a stone cairn [rock pile] constructed by walkers "wishing to leave their mark").

The walk's attraction is the natural environment, but this is being destroyed.

**Jean**  
(Forest and Bird)

The increase in tourism associated with the Crossing has enabled many businesses such as mine to be established. Over 80% of my customers are tourists and I employ 11 people at the height of the season. Most of these jobs are in the bar-café, but I also employ guides and casual shuttle drivers ferrying people to and from the Crossing. My 11 employees have 15 family members dependent on their income. The crossing is vital not only to my employees and their families, but also to the economic and social well-being of the region. The future viability and growth of National Park Village, its economy, and the welfare of its residents, depends on increased numbers of walkers.

**Gerald**  
(café and bar owner)

When I came to National Park Village 25 years ago, local women were quite depressed, as there were few opportunities for them; the trains no longer stopped at National Park Station; and both tourism and agriculture were facing tough times. This put stress on women especially, as they found it difficult to find work. Tourism brought job opportunities for women, as well as young people, however traditional job opportunities for women such as waitressing and housemaiding are both menial and poorly paid, so the gains for these women are not as great as they could be. While increased tourism is important, the value of work mainly done by women needs to change if there are to be significant benefits for women in the area.

**Anne**  
(hospitality services)

To the Ngāti Tūwharetoa, the maunga (mountains) are considered tapu, having great spiritual and cultural significance. Many Māori – especially older Māori – do not walk on the mountains because of their tapu status. To ensure protection of the tapu of Tongariro, Ngauruhoe, and Ruapehu, the peaks were gifted to the government in 1887 to become one of the world's first national parks. Māori have concerns over breaches of tapu due to the rubbish left on the crossing (including human waste), and a lack of respect through lack of understanding of the mountain's tapu. For Māori, the word "sustainable" has both a physical and spiritual meaning – it goes to the heart and soul of being Māori. Our rangatiratanga have kaitiaki responsibilities to protect the health and well-being of the crossing, while wishing to provide opportunities for our rangatahi by creating a sustainable Māori business based on our values.

**Moana**  
(social worker)

The growth of tourist numbers has impacted considerably on the costs for the Department of Conservation (DOC), who administer the crossing. The track has needed upgrading to cope with the increased numbers of walkers, and to protect the environment. There have been increased costs for search and rescue operations, for providing and cleaning toilets, and for collecting and disposing of rubbish. The toilets are also vaulted (a closed system), to both preserve the natural environment and respect Māori cultural values, then pumped out and the waste helicoptered out of the park, which incurs considerable cost. Due to increased numbers of walkers, we have had to install more toilets this year. While the Tongariro Alpine Crossing attracts 130 000 day walkers a year, it is only a one-day walk, for which there is no charge to support the costs of maintaining the crossing. Other great walks such as the Milford Track are multi-day walks, and DOC are able to both limit the number of walkers and recoup costs through hut bookings and fees.

**Gail**  
(park manager)

## Acknowledgements

Material from the following sources has been adapted for use in this examination (accessed 10 April 2017).

### Geographic Concepts

<http://seniorsecondary.tki.org.nz/Social-sciences/Geography/Key-concepts>.

### Introduction

[http://www.themissingyear.com/wp-content/uploads/2011/12/tongariro\\_crossing.gif](http://www.themissingyear.com/wp-content/uploads/2011/12/tongariro_crossing.gif) (first image), <https://static1.squarespace.com/static/54da6491e4b0e9733e136e9a/t/54f674e6e4b022f2bcd6fd8f/1425438058139/tongariro+emerald+lakes> (second image), <https://slouchingtowardsthattham.files.wordpress.com/2011/03/268-tongariro-crossing-red-crater.jpg> (third image), and [https://www.tongarirorivermotel.co.nz/wp-content/uploads/2016/08/DSC\\_0352-Too-Many-Trampers.jpg](https://www.tongarirorivermotel.co.nz/wp-content/uploads/2016/08/DSC_0352-Too-Many-Trampers.jpg) (fourth image).

### Resource A

[https://c6.staticflickr.com/4/3665/19697613629\\_03a86cd01f\\_z.jpg](https://c6.staticflickr.com/4/3665/19697613629_03a86cd01f_z.jpg).

### Resource B

<http://www.topomap.co.nz/>.

### Resource D

“Tongariro Alpine Crossing” (Department of Conservation, 2008), p 1, <http://www.doc.govt.nz/Documents/parks-and-recreation/tracks-and-walks/tongariro-taupo/tongariro-alpine-crossing-factsheet.pdf>.

### Resource E

<http://www.rotorua-travel-secrets.com/images/tongariro-alpine-crossing-start.jpg> (first image), <https://runningthroughdays.files.wordpress.com/2011/12/tongariro-crossing-1973.jpg> (second image), [https://photos.smugmug.com/Featured-Galleries/Tongariro-Crossing/i-NQJbFtq/0/M/20140111\\_tongariro\\_crossing\\_0093-Edit-M.jpg](https://photos.smugmug.com/Featured-Galleries/Tongariro-Crossing/i-NQJbFtq/0/M/20140111_tongariro_crossing_0093-Edit-M.jpg) (third image), <https://media-cdn.tripadvisor.com/media/photo-s/0a/e4/68/13/must-like-stairs-to-do.jpg> (fourth image), <http://www.rentacampervan.co.nz/attractionBigImg/1114935382.jpg> (fifth image), <https://static.franks-travelbox.com/1/3/7/b/137b55de4d57c9f76c34bda748140473976a1502/zwischen-den-maechtigen-gipfeln-des-mount-ngauruhoe-und-des-mount-tongariro-befindet-sich-der-beruehmte-red-crater-neuseeland.jpg> (sixth image), [http://www.adventurenationalpark.co.nz/wp-content/uploads/2015/11/to\\_blue\\_lake-300x225.jpg](http://www.adventurenationalpark.co.nz/wp-content/uploads/2015/11/to_blue_lake-300x225.jpg) (seventh image), and [https://tramper.nz/files/objectversions/2985/DSC01403\\_th.jpg](https://tramper.nz/files/objectversions/2985/DSC01403_th.jpg) (eighth image).

### Resource F

<http://www.tongarirorivermotel.co.nz/tongariro-alpine-crossing-problems-on-tv1/> (second image), and <https://www.wildernessmag.co.nz/wp-content/uploads/2016/11/Cars-at-Tongariro.web.jpg> (third image).

### Resource G

<https://upload.wikimedia.org/wikipedia/commons/3/32/Tongariro-Nationalpark.png> (first image) and <http://www.visitruapehu.com/media/2684/nat-park-village-to-ruapehu.jpg?anchor=center&mode=crop&width=1600&height=1200&rnd=131066700920000000&quality=70> (second image).

### Resource H

Statistics New Zealand.

### Resource I

[http://safaritalk.net/uploads/gallery/album\\_934/gallery\\_1\\_934\\_334323.jpg](http://safaritalk.net/uploads/gallery/album_934/gallery_1_934_334323.jpg) (first image), <https://us.123rf.com/450wm/tsyhun/tsyhun1511/tsyhun151100003/47967762-small-business-owner-working-at-his-cafe.jpg?ver=6> (second image), [http://www.careerfaqs.com.au/images/news\\_pages/sitting\\_woman\\_4965338.jpg](http://www.careerfaqs.com.au/images/news_pages/sitting_woman_4965338.jpg) (third image), [http://women.govt.nz/sites/public\\_files/styles/standard\\_page\\_image\\_33/public/mychillybin100802\\_322\\_large%20-%20woman%20with%20greenstone%5B1%5D.JPG?itok=-tUBqh4v](http://women.govt.nz/sites/public_files/styles/standard_page_image_33/public/mychillybin100802_322_large%20-%20woman%20with%20greenstone%5B1%5D.JPG?itok=-tUBqh4v) (fourth image), and [https://farm7.staticflickr.com/6172/6198012833\\_d892d264a8\\_z.jpg](https://farm7.staticflickr.com/6172/6198012833_d892d264a8_z.jpg) (fifth image).