2

91243R

NZQA
NEW ZEALAND QUALIFICATIONS AUTHORITY
MANA TOHU MĀTAURANGA O AOTEAROA
QUALIFY FOR THE FUTURE WORLD
KIA NOHO TAKATŪ KI TŌ ĀMUA AO!

Level 2 Geography

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

Credits: Four

RESOURCE BOOKLET

SAMPLE ASSESSMENT

For copyright reasons, these resources cannot be reproduced here.
(See NZQA's secure website for the full version.)

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

Check that this booklet has pages 2–10 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

Change
Change involves any alteration to the natural or cultural environment. Change can be spatial and / or temporal. Change is a normal process in both natural and cultural environments. It occurs at different times and in different places. Some changes are predictable, while others are unpredictable. Change can bring about further change.

Processes
Processes are 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.

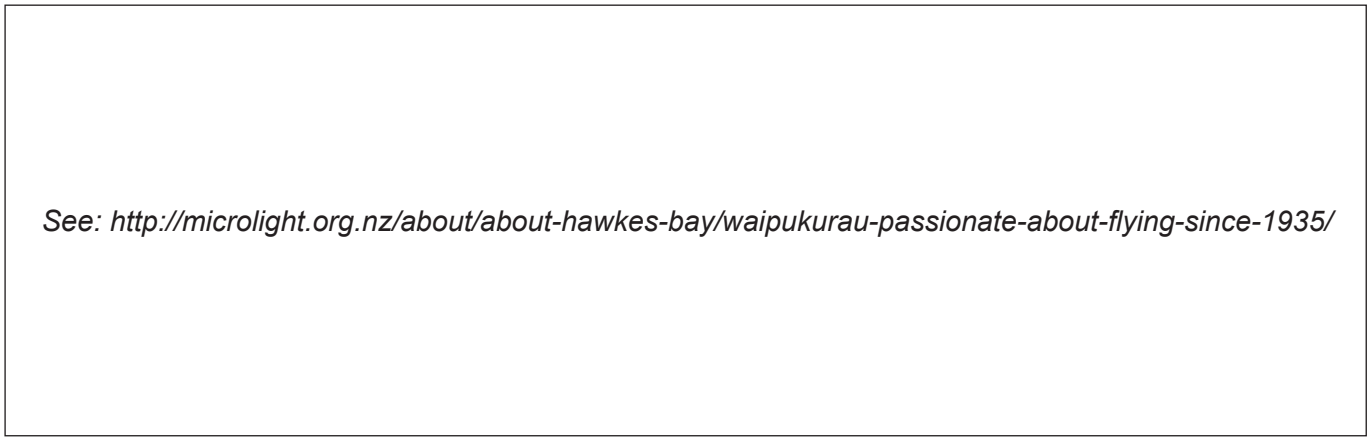
Sustainability
Sustainability involves adopting ways of thinking and behaving that allow individuals, groups, and societies to meet their needs and aspirations without preventing future generations from meeting theirs. Sustainable interaction with the environment may be achieved by preventing or minimising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

Kaitiakitanga
Kaitiakitanga means caring for the environment; sustainable use, management, and control of natural and physical resources that are carried out to the mutual benefit of people and resources.

Resource A: The Ruataniwha Plains, Central Hawke's Bay

The location of Central Hawke's Bay

The Ruataniwha Plains, Central Hawke's Bay, looking westward to the Ruahine Ranges



An aerial view of Central Hawke's Bay

Resource B: Agriculture, the need for water, and drought

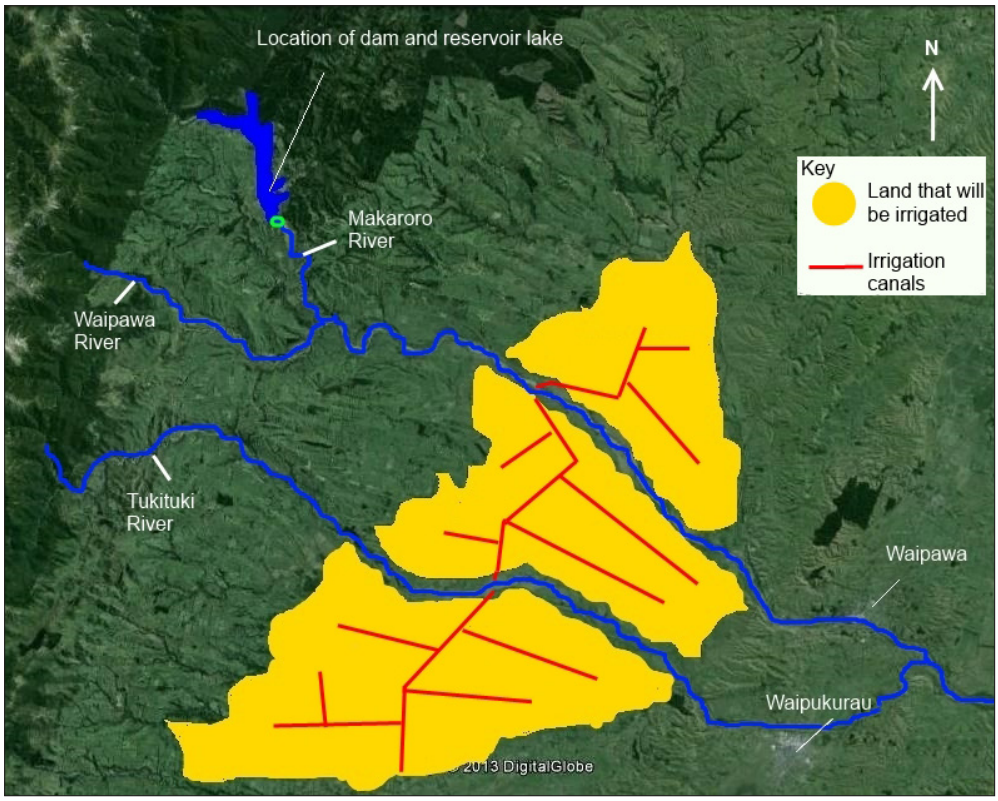
The Central Hawke's Bay's economy is based on agriculture including dairy, sheep, arable (crops) and mixed arable farming; horticulture (e.g. apples and pears); and viticulture (grapes for wine making).

See: http://www.niwa.co.nz/publications/wa/water-atmosphere-8-september-2013/dust-bowled

However, the viticultural industry did very well. The winemaker at Pask Winery reported that winemakers had an "exceptional" year. The increased sunshine and lack of water led to the production of small, but intensely flavoured grapes; the result was that the 2013 wines were considered by some to be the best since 1998.

Resource C: The proposed Ruataniwha Water Storage Scheme

In response to the 2013 drought, the proposal to develop the Ruataniwha Water Storage Scheme on the Makaroro River (a tributary of the Tukituki River), would involve building a dam to store water during peak periods of high winter rainfall. The water would then be released into rivers during the dry summers and droughts, which would improve river flows and feed irrigation canals on the Ruataniwha Plains to meet the needs of farmers.



Map of the proposed Ruataniwha Water Storage Scheme

Before dam is built

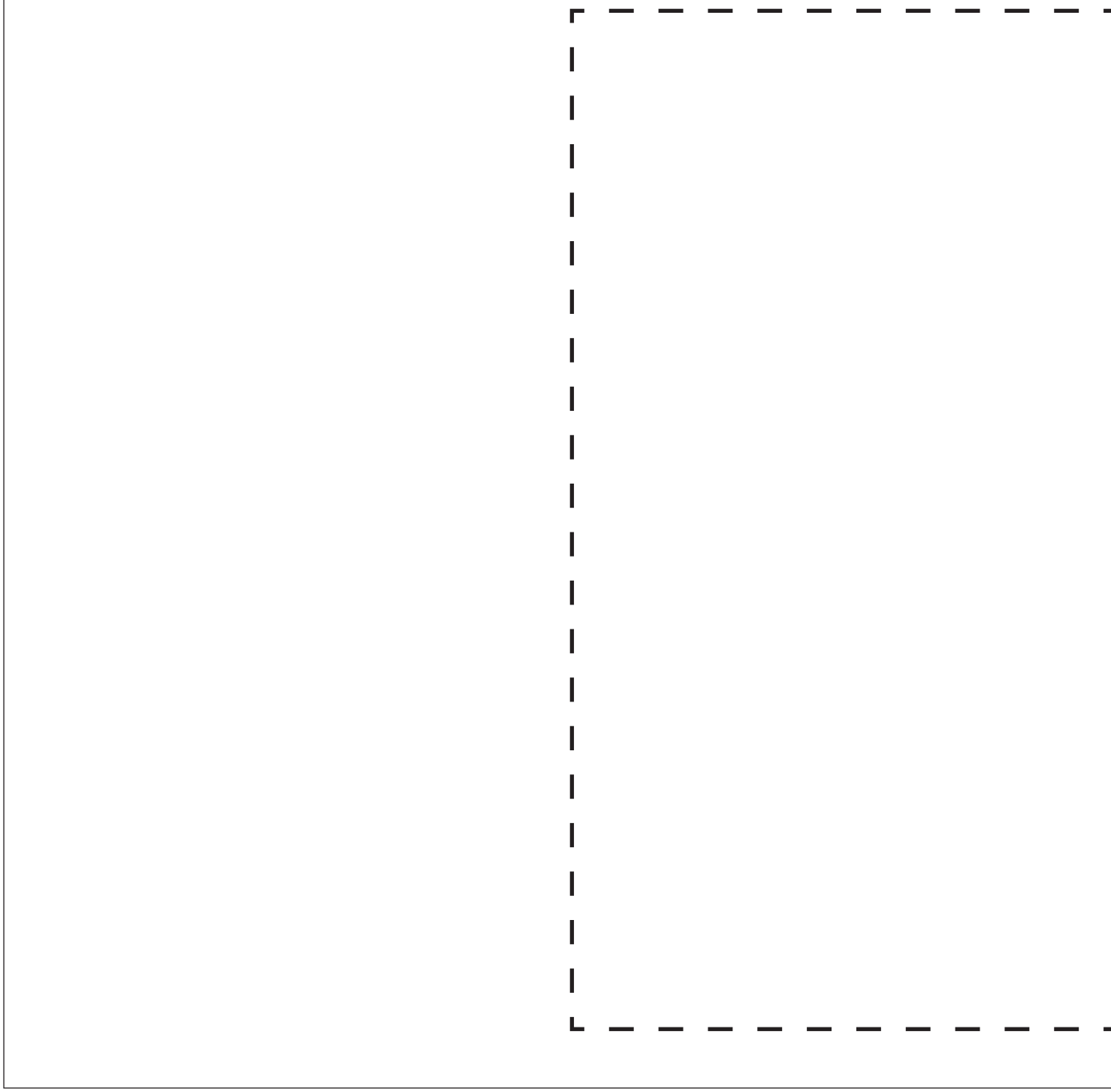
See: http://www.stuff.co.nz/ dominion-post/business/9189077 /Investors-consider-Ruataniwha-Dam-project

After dam is built

An artist's impression (looking up the Makaroro River) of the reservoir lake created by the proposed Ruataniwha Water Storage Scheme

Resource D: Topographic map of the Ruataniwha Plains and Waipukurau

See: http://www.linz.govt.nz/topography/topo-maps/map-chooser/napier
and
http://www.linz.govt.nz/topography/topo-maps/map-chooser/dannevirke



Key

See: http://www.linz.govt.nz/topography/topo-maps/map-chooser/napier
and
http://www.linz.govt.nz/topography/topo-maps/map-chooser/dannevirke

Resource E: Effect of nitrate run-off on the Central Hawke's Bay Environment

Nitrogen is essential to all life. Nitrogen, in the form of nitrates, found in fertilisers and animal excretions (especially urine), is beneficial to plant growth and allows for more intense and productive agriculture.

However, excessive amounts of nitrate run-off from farmland entering streams and rivers create serious environmental problems. Nitrate run-off has already seriously affected the quality of many rivers, such as the Manawatu, and freshwater lakes such as Lake Rotorua, are considered to be heavily polluted from it.

Most nitrates entering waterways from farming come from fertilisers and cow urine. The nitrates from fertilisers and urine not taken up by plants are dissolved by rainwater, and carried into the soil and the groundwater, then eventually into streams and lakes. Within the streams and rivers, the nitrates become sources of food for algae and other water plants, resulting in the formation of algal blooms (vigorous growth of aquatic plants or water weeds). The water weeds and algae can clog streams, reduce water clarity in rivers, and as they take up oxygen from the water, fish and other aquatic life cannot survive. This is most likely to occur in summer when the water is warmest, river flows are slow, and there is plenty of sunlight.

Increased nitrates also affect filter-feeding shellfish in estuaries, like scallops and mussels. The shellfish accumulate algal toxins, making them unsafe for human consumption.

It is estimated that as a result of the increase in farming resulting from the proposed Ruataniwha Water Storage Scheme, nitrate run-off from farms would increase by 50%, threatening the health of the Tukituki River.

Resource F: The impact of the Ruataniwha Water Storage Scheme on selected farm types

Farm type	Change in Profit ($ / ha)	Change in Water Required (tonnes / ha)	Change in Fertiliser Use ($ / ha)
Orchard			
Vineyard	*See: http://www.hbrc.govt.nz/HBRC-Documents/HBRC%20Document%20Library/RWSS%20FactsheetandFinancials%20FINAL.pdf*		
Dairy			
Fully irrigated arable			
Fully irrigated mixed arable			

Resource G: Benefits of the proposed water storage scheme

The proposed scheme would provide monitored river flows throughout the year to both help maintain the river's ecology and supply reliable irrigation for approximately 25 000 hectares of land.

See: http://www.hbrc.govt.nz/HBRC-Documents/HBRC%20Document%20Library/5.0%20socioeconimpact%20FINAL.pdf

Other positive results would come from the arrival of new families into the area, increasing the populations of small towns such as Waipukurau and Waipawa. This would lead to a subsequent rise in school rolls, and create a demand for more leisure and recreational facilities such as libraries, sports centres, and swimming pools.

Resource H: Limitations of the proposed water storage scheme

A local Labour Party member has said that he has reservations about the long-term viability of the proposed storage scheme. "When spending ratepayers' or taxpayers' money, there needs to be sufficient buy-in from local farmers to ensure that the scheme is successful. Only around 13% of landowners (20 of the 150 landowners potentially involved) have formally expressed interest in participating in the irrigation scheme when there must be at least 40% uptake (60 of the 150) of the scheme for it to be financially sustainable."

See: http://thedailyblog.co.nz/2013/05/30/water-storage/
and
http://www.baybuzz.co.nz/issues/ruataniwha-dam/

Hawke's Bay Fish and Game expressed their concern regarding additional river pollution in a statement, outlining that the intensified land use (dairy and arable cropping) would result in increased nitrate run-off from fertilisers and stock effluent; this would lead to growth of algae, which would clog the rivers and suffocate fish; and this would end up with the Tukituki River being closed to the public – as it is now over the summer months – because it would be unsafe for swimming and other recreation activities, due to the levels of *E. coli* and phormidium (toxic algae) resulting from the increased effluent from livestock.

Resource I: Pamplet for dairy farmers

The local council has suggested that a pamphlet be designed and distributed to dairy farmers to encourage them to mitigate river pollution.

Calling All Dairy Farmers …

Nitrates from fertilisers and stock effluent entering streams and rivers encourages the growth of algae and weeds, and kills the ecology of our waterways.

See: http://www.tongarirorivermotel.co.nz/wp-content /gallery/other-rivers_1/cattle-in-wanaganui-river.jpg

Stock in streams is environmentally unacceptable!

What can you do?

There are two main ways you can help to mitigate river pollution:

1. *Fence off waterways*
   Fences stop stock from wandering into or excreting in them.
2. *Plant vegetation*
   Plants, such as flax, act as a buffer to stop fertilisers and stock effluent draining into waterways. Planting vegetation also stabilises river banks, and provides shelter for wildlife such as pūkeko, as well as trout, eels, and freshwater crayfish.