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Mana Tohu Mātauranga o Aotearoa  
New Zealand Qualifications Authority

## Level 2 Agricultural and Horticultural Science 2023

### 91297 Demonstrate understanding of land use for primary production in New Zealand

Credits: Four

Achievement	Achievement with Merit	Achievement with Excellence
Demonstrate understanding of land use for primary production in New Zealand.	Demonstrate in-depth understanding of land use for primary production in New Zealand.	Demonstrate comprehensive understanding of land use for primary production in New Zealand.

Check that the National Student Number (NSN) on your admission slip is the same as the number at the top of this page.

**You should attempt ALL the questions in this booklet.**

If you need more room for any answer, use the extra space provided at the back of this booklet.

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

Do not write in any cross-hatched area (DO NOT WRITE IN THIS AREA). This area will be cut off when the booklet is marked.

**YOU MUST HAND THIS BOOKLET TO THE SUPERVISOR AT THE END OF THE EXAMINATION.**

Excellence

TOTAL **22**

**QUESTION ONE: Land use – North and South**

- (a) Select a North Island region, describe a land use that is commonly carried out there, and explain why it is carried out in that region.

Region: Hawkes Bay

In Hawkes Bay, a land use that is commonly carried out there is apple orcharding. Apple orcharding is carried out in Hawkes Bay for various reasons. Apple orcharding is the process of growing and developing apples in orchards for buying use. Apples are commonly grown throughout the region of Hawkes Bay because of the suitable climate and weather and supply of workers. Hawkes Bay is a region with relatively warm summers with around 9 hours of sun every day. Due to this, the suitable climate is what apples need to grow and develop in. With the process of photosynthesis, more hours of direct sunlight, along with shade in the cool nights, allow for increased sugar

1-a. development. Increased sugar development during the summer occurs due to the suitable climatic factors for apples to grow in. With an increased sugar yield in apple, apples become more desirable to consumers and global trade, as sweet & juicy apples is what is in demand globally for markets across the world. Additionally, Hawkes Bay has a high number of workers coming in from overseas to do seasonal work. With various companies across Hawkes Bay to supply with workers to help grow, pick, irrigate, and spray apples with, the more suitable it is for the the land use of apple orcharding to occur in Hawkes Bay.

- (b) Select a South Island region, describe a land use that is commonly carried out there, and explain why it is carried out in that region. The land use selected must be different from part (a).

Region: Southland

In Southland, a land use that is commonly carried out there is sheep and beef farming. Sheep and beef farming is carried out in Southland for various reasons. Sheep and beef farming is carried out in Southland due to the suitable climatic factors and worker supply/population. Sheep and beef farming is a land use that is suitable for the land and climate. Southland's climate is relatively cold and windy in winters and warm in summers. The climate is not suitable for land use for intensive farming such as dairying or crop development. Due to this, land use ~~changes~~ is suitable for sheep and beef farming instead. Sheep have thick wool which protects

1.6. them from cold weather and wind. Cows have thick skin as their hide is thick, and this helps keep cows warm. Due to sheep and cows being able to withstand the cold and windy climate in Southland, the land use of sheep and beef farming in Southland is carried out. Since other land use such as high intensive farming, e.g. dairying and crop growth, aren't suitable to Southland, and sheep and beef farming is, this is why land use of sheep and beef is carried out in Southland. Additionally, Southland is a large region with a relatively good population. With the high population of people, means that there is an increased number of people who will want to work for sheep and beef farming. Since sheep and beef farming requires a lot of people for various different jobs, the high population in this region is suitable to allow for sheep and beef farming due to a large population.



- (c) For one of the regions from page 2, justify a landowner's decision to either convert to a new land use or keep the land in its current use.

In your answer consider TWO of the following factors:

- economic ✓
- political
- environmental ✓

Region: Hawkes Bay.

For the region of Hawkes Bay, a landowner's decision to keep the land in its current use, is considered with the economic and environmental factors. A landowner should keep the land in its current use of apple orcharding as the region is suitable for the growth and development of apples, due to the environmental factor of climate and due to the economic gain of apple orcharding in Hawkes Bay. Hawkes Bay is a region with relatively warm summers with around 9 hours of sunlight everyday. For apple growth and development, apples need a good amount of sunlight everyday in order to grow to optimal levels. In order for growth and development, photosynthesis must be carried out. Due to the suitable environmental factor of good climate and weather for plant growth, apple plants can effectively grow and develop to the best conditions. During the process of photosynthesis, apple sugar development increases with the amount of sunlight exposure. Due to good sunlight exposure, apples in Hawkes Bay can grow with high sugar levels. Additionally, This means that apples that are grown here are sweet and juicy. Sweet and juicy apples are what is in demand in markets across the globe. With optimal apples grown in Hawkes Bay, this means there is more to be sold for consumer demand. As the land in Hawkes Bay is ~~used~~ continued to be used for apple orcharding, the landowner will continue to have an economic gain. With the landowner continuing to grow and develop apples in Hawkes Bay, the ~~market~~

landowner can introduce their good quality apples to the market in New Zealand, and even global markets. <sup>Additionally, the good climate provides</sup> in other countries. ~~With~~ an increased yield of apples as more can grow and survive in the warm weather, instead of dying out if the weather was cold, which isn't suitable for the growth and development of apples. With the combined factor of increased yield and <sup>great</sup> ~~increased~~ sugar quantities in apples, the landowner will see a great economic gain for themselves, but also for the community of Hawkes Bay. With the apples being grown in Hawkes Bay, the landowner will employ people in the region and will ~~buy~~ purchase products ~~from the region~~ from sellers in Hawkes Bay to help provide equipment for apple orcharding. With the landowner buying from in the economy of Hawkes Bay, money will go back into the local economy of Hawkes Bay, helping ~~provide~~ economic stability for Hawkes Bay's people and jobs.



## QUESTION TWO: Urban sprawl

"The Ministry for the Environment's *Our land 2021* report shows that between 2002 and 2019, 54 percent of highly productive land was lost to housing, while cities and towns have sprawled by about a third," said the former HortNZ chief executive.

"This situation simply isn't good enough, considering that the primary production sector is the backbone of the New Zealand economy and only 15 percent of land is suitable for food production.

"The Government must act now to retain remaining highly productive land. Once houses have been built on it, that soil is lost forever."

- flat hilly land - large population*
- (a) The environmental and social factors that make land suitable for intensive production systems such as market gardens, also make it suitable for urban land use. Explain why this is so.

*The environmental and social factors that make land suitable for intensive production systems, such as market gardens, also make it suitable for urban land use.*

*Land that is suitable for intensive production systems, such as market gardening or crop development, are typically flat and / or hilly land that is suitable for the growth and development of crops, ~~therefore~~ is also suitable for urban land use, as both intensive production systems and urban land use require land that is fertile and relatively flat. The environmental factor that makes land suitable for intensive production systems and urban land use is that the environment of the land is suitable to host these*

2.a. land uses. This is why the the land is ~~as~~ suitable for both intensive production systems and urban land use due to the suitability of the land and environment. Additionally, the social factors that make the land suitable for intensive production systems, such as market gardens, also make it suitable for urban land use. The social factors of a large population make the land suitable for intensive ~~the~~ production systems and urban land use. With a large population, there is an increased need for more housing development for houses. With a large population, land becomes more suitable for intensive production systems, because more land must be used in order to supply more food, and this would be done by intensive production systems such as crop production. <sup>land</sup> That that is suitable to grow crops must be flat and/or hilly, and is <sup>a</sup> suitable environment for urban land use. With a large population, land ~~use~~ that is suitable for intensive production is also suitable for urban land use. In order for land to be suitable for intensive production, it must be flat and hilly. Land that is able to withstand intensive production can be also suitable for urban land use as it is flat land.

2.a. land uses. as the land being flat and/or hilly is the perfect conditions for land use of intensive production and urban land use.



- (b) Justify a council's decision not to allow the re-zoning of rural farmland into urban zoned land. In your answer consider the economic and political factors.

A council's decision not to allow the re-zoning of rural farmland into urban zoned land is considered due to economic and political factors. A council in a region can make decisions which can or cannot allow the re-zoning of rural farmland into urban zoned land. Due to political factors, a regional council can decide if rules can apply to land or not. A council may decide to not allow the land use to be changed, from rural farmland into urban zoned land. In certain areas, a council may not allow the change to occur because the political factors don't apply and a law might be broken. If rural farmland ~~is~~ use is with land that is ~~safe~~ unsafe, land use cannot change. If <sup>the area of</sup> rural farmland is unsafe, political factors come into play. With land being unsafe for the development of houses and becoming a place for urban zoned land, the re-zoning may not occur due to political rules, such as laws, being broken. Urban land development on land that is rural farmland that is unsafe, makes the development of houses illegal and a council's job is to stay within the law and not do any illegal activity. If an area that is rural farmland is considered unsafe, a council cannot allow for the re-zoning of the land to occur. Additionally, economically factors can justify a council's decision to not allow the re-zoning of rural farmland into urban zoned land. If the production costs of ~~building~~ re-zoning rural farmland to urban zoned land is expensive or potentially out of budget for the council, the council may choose to not rezone this land. Due to the economic factor of an expensive re-zoning of the land, <sup>/large amount of money to pay for</sup> the council may not allow for the re-zoning since they need to focus on other activities in their region. An economic decrease for the council can take a huge toll on the council's economic budget, meaning that other activities cannot take place. So in order for this not to occur, the council will make the decision to not.



### QUESTION THREE: Changing land uses

Over the past 20 years some land users have seen considerable change in land area while others have seen very little change.



- (a) Referring to the graph above, how have economic and technological factors led to land use change?

Economic and technological factors have led to land use change. Over the past 20 years, some land users have seen considerable change in land area, while others have seen very little change. As we can see, according to the graph above, economic and technological factors come into play. With new technology being created for various land use areas, there is change in farm land use. With new technology, being created and becoming more ~~advances~~ advanced, some areas of land use decrease, while others increase. As on the graph, sheep ~~land~~ and beef cattle land use had significantly decreased from 2000 to 2015. <sup>while others continued to increase.</sup> Reasons may be that the economic gain from sheep and beef cattle land use was not very

★ Turn to back of paper, answer is continued there.

3-a. was not very profitable, so land use for sheep and beef cattle changed to another land use. Additionally, with an increase in ~~advantages~~ advanced technology, more farm land use become more popular / or desirable to carry out. So land use changes, because technology is better in other industries.

THIS EXTRA ANSWER PAGE MUST BE PLACED INSIDE THE PLASTIC BAG WITH YOUR ANSWER BOOKLET AND HANDED IN



- (b) Choose one land use from the graph and analyse how TWO factors might affect this land use in the future.

Choose two factors:

- political ✓
- social
- workforce. ✓

~~A land use~~ ~~The land use of Dairy cattle for land use is affected by~~

Political and work force factors might affect the land use of dairy cattle in the future. Over the past 20 years some land users have seen considerable change in land area, while others have seen very little change. Due to various factors, farm land use in New Zealand from 2000 to 2020, has increased but then decreased from 2015. Land use may be affected for dairy cattle in the future if factors such as political policies come into play. With political factors, certain regional councils or governments may restrict certain processes in dairy cattle land use. If there is a change in political policies in the future, land use ~~change~~ for dairy cattle can also change to apply to rules and laws. ~~If there are bans on certain~~ Due to social factors, socially people may spread interest in stopping dairy cattle land use in certain areas. People may want to change laws surrounding land use for dairy cattle, because it either be inhumane or <sup>/milk production</sup> not allowing for the best production of dairy cattle. If people bring their own social ideas into political ideas, such as opinions on laws, the political side of dairy cattle land use may change. With laws and rules changing or even staying how they currently are, people may provide opposition and protests to the laws of dairy cattle farming in New Zealand. With laws changing, dairy cattle land use can become more restricted, meaning that production is more difficult. With production being more difficult, farmers may choose to reduce or stop their dairy cattle farm land use and instead change it into other land uses in the future. With this future land use change,

land use for dairy cattle changes significantly, as production of milk can decrease, whether or not it be a small or large change in dairy cattle land use. Additionally, workforce factors may affect dairy cattle land use in the future. With an increase of workforce companies, and/or workers, there should be an expected increase of dairy cattle land use. With an increase in workers, there will be a higher chance of an increase of ~~star~~workers going into working for dairy cattle. With a larger number of workers, more people can help work for various companies and farmers for dairy cattle production. This could include technology, raising cattle, help collect and store milk, and make dairy products. With an increase in workers, more cattle can be born and worked with. Socially, with an increase in workers, allowing for more new types of dairy products, the sales can increase, supporting the growth of dairy cattle farm land use. With an increase in workers, more people can work with dairy cattle, allowing for land use ~~change~~ to be increased in the future. This is a change as ~~there~~ there has been a decrease, and an increase in farm land use for dairy cattle in New Zealand, means more area of New Zealand will be used for dairy cattle.



~~Question Three: Changing Land Uses~~

~~3.1 profitable in terms of land use, while other~~

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#### Acknowledgements

Material from the following sources has been adapted for use in this assessment:

#### Page 5

(quote) <https://www.hortnz.co.nz/news-events-and-media/media-releases/government-report-shows-need-for-urgent-protection-of-land-for-food-production-hortnz-says/>

(image) <https://www.stuff.co.nz/national/politics/local-democracy-reporting/300687900/government-gets-set-to-announce-new-policy-to-protect-prime-horticultural-land>

#### Page 8

(graph) <https://www.stats.govt.nz/indicators/agricultural-and-horticultural-land-use>

## Excellence

**Subject:** Agricultural and Horticultural Science

**Standard:** 91297

**Total score:** 22

Q	Grade score	Marker commentary
One	E7	The candidate covered environmental reasons in detail and included some economic reasons. The justification of why a landowner would retain the current land use is articulated well with focus on economic and environmental factors.
Two	E7	The candidate focussed on economic factors to provide a justification of their response.
Three	E8	The candidate responded well to this question by focussing on political and workforce factors to provide an analysis of change in land use.