

Assessment Schedule – 2015**Agricultural and Horticultural Science: Demonstrate understanding of land use for primary production in New Zealand (91297)****Evidence Statement****Question One: Reclaimed swamp land**

Achievement	Achievement with Merit	Achievement with Excellence
Explains TWO factors that in the past have determined whether swamps were drained and converted for use in primary production. OR Explains , using economic and environmental factors, the future use of land reclaimed from swamps.	Explains in detail , TWO factors that in the past have determined whether swamps were drained and converted for use in primary production. OR Explains in detail , using economic and environmental factors, the future use of land reclaimed from swamps.	Analyses the future use of land reclaimed from swamps, in terms of economic and environmental factors.

N0	No response; no relevant evidence.
N1	Some writing, but does not explain any factors that in the past have determined whether swamps were drained and converted for use in primary production, or the future use of this land.
N2	Partial or insufficient explanation of any factors that in the past have determined whether swamps were drained and converted for use in primary production, or the future use of this land.
A3	Explains at least ONE factor that in the past have determined whether swamps were drained and converted for use in primary production; <i>OR</i> explains, using economic or environmental factors, the future use of land reclaimed from swamps.
A4	Explains at least ONE factor, with some supporting data, that in the past have determined whether swamps were drained and converted for use in primary production; <i>OR</i> explains, using economic or environmental factors, with some supporting data, the future use of land reclaimed from swamps.
M5	Explains in detail, TWO factors that in the past have determined whether swamps were drained and converted for use in primary production. One factor explained in detail, the other factor explained; <i>OR</i> explains in detail, using economic and environmental factors, the future use of land reclaimed from swamps. One factor explained in detail, the other factor explained.
M6	Explains in detail, TWO factors that in the past have determined whether swamps were drained and converted for use in primary production. Both factors explained in detail; <i>OR</i> explains in detail, using economic and environmental factors, the future use of land reclaimed from swamps. Both factors explained in detail.
E7	Analyses the future use of land reclaimed from swamps in terms of economic and environmental factors. Comprehensive evidence given for ONE factor, with the other factor well supported.
E8	Analyses the future use of land reclaimed from swamps in terms of economic and environmental factors. Comprehensive supporting evidence given for TWO factors.

Q1	Sample evidence
(a)	<p>Explains TWO factors that in the past have determined whether swamps were drained and converted for use in primary production.</p> <p><i>Economic</i></p> <p>The land was usually cheap to buy, and people drained it to make it useable for primary production. Due to the costs associated with draining land, it was then used for high-value products such as dairying to recoup costs.</p> <p><i>Workforce considerations</i></p> <p>Cheap labour was available for help with drainage work. It provided people living in the area with work.</p> <p><i>Environmental</i></p> <p>Due to the wet nature of the land, there is no need for irrigation and there is easy access to water. Swamp land contains very fertile soils, so can be used for pasture growth. During this time, there were generally no requirements to maintain the swamp environment, and so little consideration was given to doing this.</p> <p><i>Political</i></p> <p>Reference to regional council resource consents, treaty claims, and land of cultural significance accepted.</p> <p>Explains in detail, TWO factors that in the past have determined whether swamps were drained and converted for use in primary production.</p> <p><i>Economic</i></p> <p>The land was cheaper to purchase, as it came with the associated risk of flooding. High land prices mean that buying and using land for farm practices can be uneconomic, and therefore cheaper land options such as reclaimed swamp with the occasional flood was attractive. If the land is used for dairying or other high economic value products, the low cost of the land, coupled with the high prices paid for products, can make draining the land an economically successful venture. In the past, labour to drain swamp areas was cheap and therefore economic to carry out. Soil from the drained swamp land can retain high nutrient levels, and this aids pasture growth and increases production. Nearby water sources can be utilised for cheaper irrigation systems.</p> <p><i>Workforce considerations</i></p> <p>Due to farmers often having large families and living in large rural communities, the workforce to drain swamps was easy to come by, and usually cheap to hire. Many farms were given to returned servicemen, who were appreciative of the opportunity given to them. This meant that swamp areas were drained to put into productive land. It also provided opportunities for work, and those living in the area were able to remain there.</p> <p><i>Environmental</i></p> <p>Due to people not understanding the environmental role of swamp ecosystems, such as acting as a catchment for excess water, they were considered to be economically unproductive and therefore were drained. Back then, there was no requirement to maintain the swamp environment, so swamps were drained with little consideration for the environment or the plants and animals that lived there. Soil from the drained swamp land can retain high nutrient levels, and this aids pasture growth and increases production. Nearby water sources can be utilised for cheaper irrigation systems.</p>
(b)	<p>Analyses the future use of land reclaimed from swamps with respect to economic and environmental factors.</p> <p>Due to people now understanding what positive impacts a swamp ecosystem has on the environment, such as providing a catchment for excess water, they are seen in a more positive light. People would prefer to retain them in their natural state rather than drain them. The drained reclaimed swamp areas are still prone to flooding, and this causes massive disruption to production, so many farmers are considering retiring the land and letting it revert to its original state. People are more environmentally aware now, and they will also consider the plants and animals for which that environment provides a habitat.</p> <p>Over the past decade, the climate has appeared to warm and the amount of rain and water has increased, which has led to more flooding of reclaimed pasture land. Consequently, areas that have been drained are now more prone to flooding, with the flood systems frequently overcome, and the land is potentially no longer farmable. With the land lying so close to rivers, and/or being in low-lying areas, care has to be taken to ensure that farm pollution does not run down</p>

	<p>into the rivers. Continual flooding of land reduces its economic viability. When in flood, the area cannot be used for farming and losses in production are difficult to overcome. Alternative areas must be found by farmers to hold stock during flooding, and this can reduce the initial economic gains from the low purchase cost of the land.</p> <p>In the future, swamp land may be returned to its original state as the land floods more often. This decision will have an economic impact on farmers, as if the land is no longer productive, no profit can be made, and farmers will lose their home and livelihood. Holding back the floodwaters due to climate change may be expensive and perhaps not feasible, making it increasingly difficult to maintain the current land use.</p> <p>If the swamp is returned to its original state, there could be increased local retail trade from visiting hunters.</p>
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Question Two: Urban spread onto rural land

Achievement	Achievement with Merit	Achievement with Excellence
<p>Explains, using technological and social factors, how land use is being affected by increasing urban spread.</p> <p>OR</p> <p>Explains how future land use will be impacted by social and economic factors.</p>	<p>Explains in detail, using technological and social factors, how land use is being affected by increasing urban spread.</p> <p>OR</p> <p>Explains in detail, how future land use will be impacted by social and economic factors.</p>	<p>Evaluates moving production away from urban areas, in terms of social and economic factors.</p>

N0	No response; no relevant evidence.
N1	Some writing, but does not explain any factors that determine how land use is being affected by increasing urban spread; OR how future land use will be impacted.
N2	Partial or insufficient explanation of any factors that determine how land use is being affected by increasing urban spread; OR how future land use will be impacted.
A3	Explains using technological or social factors how land use is being affected by increasing urban spread; OR explains how future land use will be impacted by social or economic factors.
A4	Explains using technological and social factors, with supporting information, how land use is being affected by increasing urban spread; OR explains how future land use will be impacted by social and economic factors, with some supporting data.
M5	Explains in detail, using technological and social factors, how land use is being affected by increasing urban spread. One factor explained in detail, the other factor explained; OR explains in detail, how future land use will be impacted by social and economic factors. One factor explained in detail, the other factor explained.
M6	Explains in detail, using technological and social factors, how land use is being affected by increasing urban spread around it. Both factors explained in detail; OR explains in detail, how future land use will be impacted by social and economic factors. Both factors explained in detail.
E7	Evaluates moving production away from urban areas in terms of social and economic factors. Comprehensive evidence given for ONE factor, with the other factor well supported.
E8	Evaluates moving production away from urban areas in terms of social and economic factors. Comprehensive supporting evidence given for BOTH factors.

Q2	Sample evidence
(a)	<p>Explains how land use is being affected by increasing urban spread, considering social and technological factors.</p> <p><i>Social</i></p> <p>More houses are being built close by as population rises. Cheaper rural land can offer a better sense of living. New residents move there for peace and quiet, and do not like some noisy or smelly rural management practices. Traditional land uses sometimes do not fit the ideal picture of rural life.</p> <p><i>Technological</i></p> <p>(Noisy) machinery or smoke pots can only be operated during (certain hours of) the day, often outside normal rural working hours. New houses encroaching on established rural properties can cause problems of access and utilisation for machinery, e.g. tractors with large spray units.</p> <p>Explains in detail, how land use is being affected by increasing urban spread, considering social and technological factors.</p> <p><i>Social</i></p> <p>The <i>Zealong Tea Estate</i> was originally established a long way from urban areas, in a rural setting. As city populations increase, more houses are built, which means areas that have been traditionally rural are now becoming developed and used for housing. When these areas begin to encroach on rural properties that are used for primary production, such as tea-growing, and pig and poultry farming, there can be a conflict between the producers and the new house owners. Management practices which previously caused no issues for the rural community begin to affect the new house occupiers. In the example above, the noise of the helicopter would have disturbed sleep and caused complaints from the local community.</p> <p><i>Technological</i></p> <p>Producers need to be able to carry out certain management practices to ensure a quality crop is produced. Often this uses equipment that may be noisy or difficult to get onto the property to utilise, such as helicopters. If this is going to cause conflict with local residents, then producers may need to change their management practices, and/or innovate – e.g. by adopting less intrusive methods through new technology.</p>
(b)	<p>Explains how future land use will be impacted by social and economic factors.</p> <p><i>Social</i></p> <p>Only restricted types of primary production will be able to be carried out. Quieter and less smelly management practices can be carried out by producers. Fewer jobs will be available if the producer shifts away. Less heavy traffic/farm machinery used for production will be on the roads.</p> <p><i>Economic</i></p> <p>The producer will have a reduced or no income during the move. There will be a loss of product, which may be offset by the sale of high-value residential land. Capital will be required to reinvest in a new property. It may not solve the problem, as some form of infrastructure may be needed at a further cost, and urbanisation may still encroach. Good rural land may not be utilised productively, due to restrictions on the type of primary production that can be carried out on it.</p> <p>Explains in depth, how future land use will be impacted by social and economic factors.</p> <p><i>Social</i></p> <p>Quieter, less smelly management practices are required to be carried out by producers, so there is less disruption to neighbours. Producers will try to minimise any issues or potential issues with the current land use if they are aware of residents' concerns. However, the producers need access to infrastructure to allow their product to be taken to market, and this often requires land located near to major cities. A possible consequence of moving is that they could later find themselves in the same situation again, as urbanisation continues to spread.</p>

Economic

The producer will have a reduced or no income during the move, unless they are able to have both properties running at the same time. There will be a loss of product as one property down-sizes before the new property comes on line with full production. The old property will be high-value residential land, so the producer will get a good price for it, but in the meantime there will be high rates and infrastructure costs. Capital will be required to reinvest and set up the new land, as well as maintaining the old property. The shift may not solve the problem, as some form of infrastructure may be needed, and urbanisation may still encroach in the future.

Evaluates moving production away from urban areas by comparing the advantages and disadvantages. Answer to consider: future use of the land, and the social and economic effects of changing the land use.

Advantages

Social issues, such as noise pollution, that affect urban people are not going to occur in rural areas, as the management practices are more readily acceptable and also affect fewer people. This means that the producers are able to carry out normal management practices to grow their produce to meet market requirements. Fewer restrictions on the type of management practices that can be carried out means that the producer is able to utilise the most cost-effective methods, e.g. helicopters, and therefore increase profits by reducing or eliminating frost damage. Encroaching urbanisation increases rural land values, thus the profit from the sale may offset the cost of the move.

Disadvantages

If the producers sell their land, they will have to move to a new, and possibly less desirable, location. This means they may need to start the new farm from scratch, and this will have a major long-term economic impact, due to reduced income. The loss of present production is an economic issue that would have to be addressed. The selling on or destroying of current 'stock' could affect present profits and economic growth. Changing the land use and moving production to a different area may not solve the problem for the grower. Rural production such as tea-growing, poultry farming, and pig production often needs to be close to infrastructure such as processing works and transport links. This infrastructure can be the very thing that attracts urbanisation. The provision of roads and locations close to urban areas makes them attractive for housing and small-holdings. Product markets are valuable to producers, and the location of production is key to economic production.

Question Three: Stock numbers in New Zealand

Achievement	Achievement with Merit	Achievement with Excellence
Explains , using TWO factors, how land use has changed in the last 20 years.	Explains in detail , which TWO factors have caused these changes in land use.	Justifies, using TWO factors, the use of information that will affect future land use.

N0	No response; no relevant evidence.
N1	Some writing, but does not explain any relevant factors that have determined land use over the last 20 years.
N2	Partial or insufficient explanation of any relevant factors that have determined land use over the last 20 years.
A3	Explains at least ONE factor that has determined land use over the last 20 years.
A4	Explains at least ONE factor, with supporting information, that has determined land use over the last 20 years.
M5	Explains in detail, TWO factors that have determined land use over the last 20 years. One factor explained in detail, the other factor explained.
M6	Explains in detail, TWO factors that have determined land use over the last 20 years. Both factors explained in detail.
E7	Justifies, using TWO factors, the use of information that will affect future land use. Comprehensive evidence given for ONE factor, with another factor well supported.
E8	Justifies, using TWO factors, the use of information that will affect future land use. Comprehensive supporting evidence given for TWO factors.

Q3	Sample evidence
	<p><u>Explains, using TWO factors, how land use has changed in the last 20 years.</u></p> <p>Land use describes the activities that occur on an area of land. From the table it can be seen that previously a large amount of land was used for raising sheep, either for wool or meat. These would have been grassland areas, both in the lowland and high country. Over the last 20 years, the number of sheep has declined by 20 million, suggesting this land is no longer being used for sheep farming. If we look at the number of dairy cows, we can see that their numbers are steadily rising. This suggests that traditional sheep farming land is increasingly being converted to dairy use, to provide pasture for the increasing dairy herds.</p> <p><i>Economic</i></p> <p>Sheep farm conversions to dairying, as there is more profit to be made, due to higher milk prices. Decreasing beef and lamb farming, due to lower red meat prices.</p> <p><i>Social</i></p> <p>Easier to pass dairy farms on to the next generation. Higher returns have a greater positive impact on immediate family and the community.</p> <p><i>Technological</i></p> <p>Ease of irrigation and newer, innovative machinery, which improves dairy farming. Low mechanisation in sheep farming.</p> <p><i>Workforce</i></p> <p>More skilled workers available. Increasing urbanisation, with workforce close to rural areas.</p> <p><i>Political</i></p> <p>Removal of economic subsidies.</p> <p><u>Explains in detail, which TWO factors have caused these changes in land use.</u></p> <p><i>Economic</i></p> <p>A strong increase in international demand for dairy products was the main driving force behind the rise in dairy cattle numbers. New Zealand dairy cows produce more than 10 times the total amount of milk that New Zealanders consume each year. Conversions from sheep to dairy allowed sheep farmers to develop businesses more, and may have added stimulation and challenge. Dairy farming currently rewards effort and performance more than sheep and beef farming. This, coupled with low farm gate prices for sheep meat, has led to the widespread change of land use. The monetary exchange rate can influence the decision to convert.</p> <p><i>Social</i></p> <p>Sheep farmers are often after opportunities for the next generation of the family, and traditionally this has been seen as limited within the sheep industry. The increasing land prices, due to the potential profits from dairying, has made passing farms on from generation to generation difficult, particularly for sheep farmers. Conversion to dairy farming allows many employment options, with jobs for sons and daughters, as well as the potential to pass farms on to more than one successor, and greater opportunity for pay-outs to siblings who have no interest in working on the farm.</p> <p><u>Justifies, using TWO factors, the use of information that will affect future land use.</u></p> <p>Using current trends in farming and land use intensification, in the future there is a prediction of further decline in sheep and beef farming, and a continued increase in dairy farming. Dairy farmland is forecast to increase by 370,000 hectares by 2020.</p>

Economic

Lowland areas which are easily irrigated are becoming more popular with raising dairy cows than sheep, due to the profitable nature of the dairy industry. The pressure which is being placed on current resources is often outweighed by the potential profit to be made. Further conversion to dairy is expected in the future, as the profit to be made per hectare is greater than for sheep or beef cattle. The total number of beef cattle has declined since 2007, despite relatively buoyant beef prices since 2010.

Environmental

The increasing amount of dairy farming has put pressure on waterways, with increased leaching of nitrogen and phosphorus into them, which in turn causes excessive growth of weeds and algae, choking the waterways. This may result in limits being placed on conversions. Continual improvement in feed and fertiliser use, protection of soils, and good effluent management are basic industry expectations. In dairy-intensive areas, radical shifts in farm systems are likely to be required in the future, with some changes in land use in waterways catchment areas. Existing farmers will do their bit to achieve these targets, but the targets will be impossible to meet if there is uncontrolled dairy intensification in over-allocated water catchment areas.

Cut Scores

Not Achieved	Achievement	Achievement with Merit	Achievement with Excellence
0 – 6	7 – 12	13 – 18	19 – 24