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OUTSTANDING SCHOLARSHIP EXEMPLAR

NZQA

NEW ZEALAND QUALIFICATIONS AUTHORITY
MANA TOHU MĀTAURANGA O AOTEAROA

Scholarship 2013
Agricultural and Horticultural Science

9.30 am Tuesday 19 November 2013
Time allowed: Three hours
Total marks: 24

ANSWER BOOKLET

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

Answer ALL questions from Question Booklet 93105Q.

Write your answers in this booklet.

Start your planning and answers to Questions One, Two, and Three from pages 2, 8, and 14, respectively.

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 2–24 in the correct order and that none of these pages is blank.

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

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You have three hours to complete this examination.

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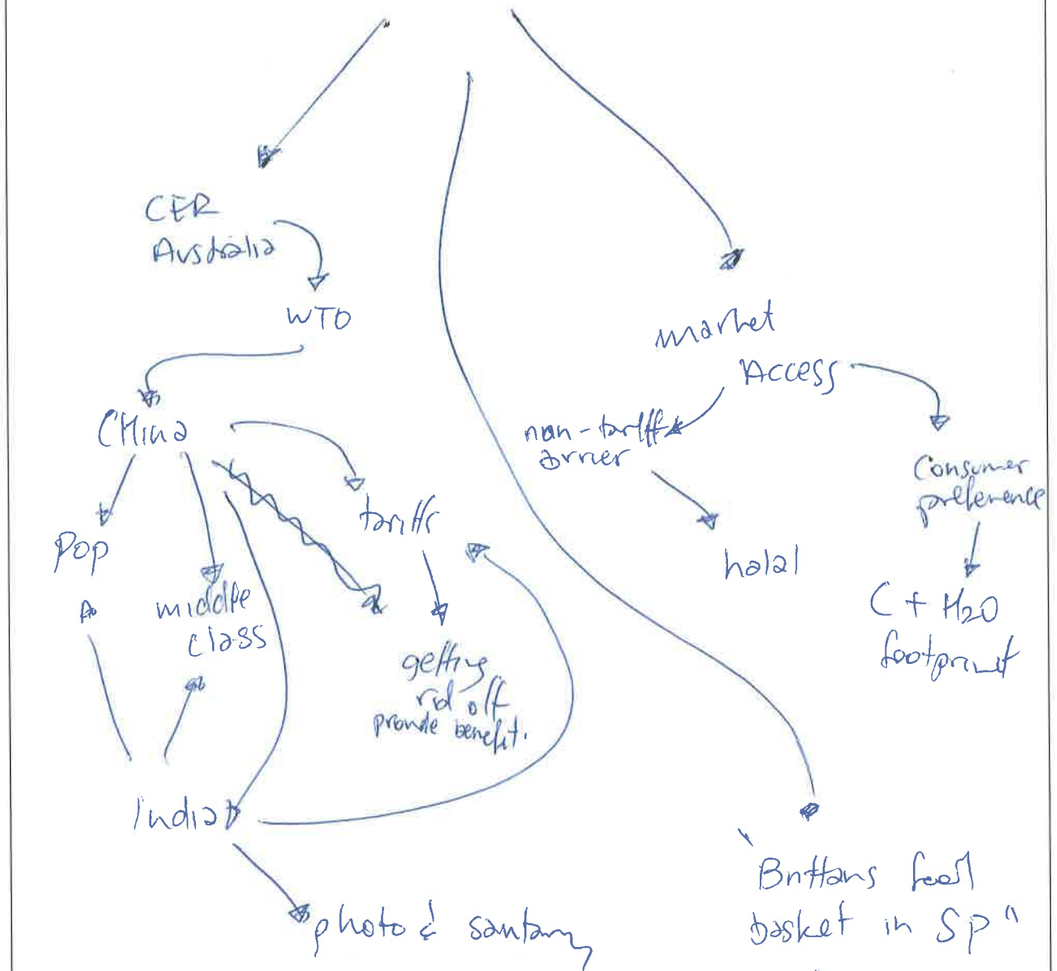
QUESTION ONE (8 marks)

The graph in Question Booklet 93105Q shows the trends in the value of New Zealand's agricultural and horticultural exports to selected markets since 1990.

With reference to TWO export-orientated primary production systems:

- discuss how changes in market access have contributed to trends shown in the choice of export destination by the exporters of New Zealand's agricultural and horticultural products
- identify and discuss the responses that have occurred within the primary production systems as a result of the identified market access issues.

Plan your answer here. Begin your answer on page 3.



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~~NZ~~ New Zealand (NZ) ~~relies~~ relies heavily on the export of primary products in order to keep us a first world country & economy. 60% of export earnings come from primary produce exports. It is therefore essential to our nation to maintain market access & further develop relationships with existing & potential ~~trade~~ trading partners. This has become increasingly evident in recent years with NZ's export companies, the farmers themselves & the NZ government all striving to increase & ensure trade deals & negotiations with many international countries. The benefits are starting to be seen in many of these markets which we are developing increasingly healthy trade relations with & the potential of some markets is becoming ~~increased~~ very promising. Trade negotiations have become one of the main focuses of ~~the~~ NZ the NZ government to ensure a future for NZ on the global picture //

NZs first major trade agreement was signed with Australia in 1983, called the Closer economic partnership (CER). This had proved to be beneficial for ~~the~~ NZ & ~~since then~~ the world Trade Organisation (WTO) was been established, which NZ has been part of & supported to increase its handle on global trade. The WTO aimed to reduce tariff & non-tariff barriers for all global trade, making it more successful & profitable for all countries involved. However their progress & success has been slow so NZ was forced to take matters into their own hands. NZ then signed a Free Trade Agreement (FTA) with Singapore, in 2001, & ~~an~~ an FTA with China in 2008, being ~~the~~ one of NZs

most successful trade partnerships. FTA's aim to reduce tariffs & quotas on exports between the countries involved; increasing the profit & export volume between both countries involved. The China - NZ FTA has done exactly that by slowly for example decreasing tariffs on lamb & beef, which were previously at ~~ten~~ 12-20%. tariffs (in 2008), slowly & eliminating them by 2015 & on milk powder, which were previously between 10-12% going into China (in 2008), slowly reducing them & eliminating them by 2020. This would be expected to have significant benefits to not only the export companies & the primary sector but the whole of NZ. Even 5 years into the ~~trade~~ FTA with China the benefits are being seen with trade to China tripling from $2 billion in 2008 to $6.9 billion today, 90% of that coming from primary produce exports. ~~Chinese~~ Exports to China now also account for 15% of NZs ~~GDP~~ GDP.

China also provides NZ & its agricultural industry with security & a ~~&~~ major potential for increase in profits & trade. China has one of the largest economies & populations in the world, presently over one billion people. This creates an insaceable, never ending demand for NZs primary products to feed their nation, & NZ ~~can~~ will never be able to solely supply their demand of primary products. Along with this China has a ~~the~~ rapidly increasing middle class, presently at 5% & estimated to be 40% of the population by

2025. This creates an increasing demand for protein based products, which ~~NZ~~ ~~they~~ are two of the main exports NZ sends to China being meat & milk powder (the other two being logs & wool), instead of the cheaper carbohydrate alternative. This creates an increasing demand for NZs ~~primary~~ high-quality primary products. It is also ~~pe~~ perceived that food safety is on Chinas "top 5 agenda" for its growing population, along with a ~~trustwo~~ reliable, trustworthy business partner. "Traceability & a stable business make NZ a good country to trade with," John Key recently explained at a speech in China. The World Bank also rate NZ as the third best country in the world to trade with. Another market which has similar potential to China, for NZ, is India. India also has one of the largest populations in the world, of over 1.2 billion people, again creating an insaceable demand for NZs primary products. They also have an increasing middle class & a high level of Santary & ~~photo~~ photosantary which they have on their agricultural imports. NZ must therefore meet these sanitary requirements, even though rating very highly in this regard compared to many other countries primary produce ~~&~~ exports. India already shows increasing market potential with ~~trade~~ exports from NZ increasing from $300 million, in 2005, to $750 million today. Tariffs on milk powder into India now also exist at up to 60% & if these were eliminated through a trade agreement, such as ~~a~~ an ~~FT~~ FTA, the benefits which it would provide NZ & our agricultural industry

would be ~~mmmm~~ immense. With the potential for the Indian market & the benefits which it may provide NZ trade negotiations are currently occuring to open up this Indian market for NZ.

Another influencial factor of ~~trading~~ international trade exists in market access & the presence of non-tariff barriers. These could be ~~necessarily~~ evident due to cultural or religious ~~regligious~~ reasons but are essually dictated by the consumer & consumer preference. In some cases it will effect sales of certain products in a country but often it may dictate market access into a country. An example of this is the requirement of Islamic countries for lamb to be halal killed, due to their religious beliefs. Islamic markets, such as Indonesia, the middle east & many parts of Africa, show & are showing an increasing market potential for NZ primary produce. Many freezing works around NZ therefore now implement halal killing into how they slaughter the majority of lamb. This is to ensure that ~~the~~ this ~~meat~~ lamb which is exported can enter & the islamic market, ensuring the benefits are gained from these markets. Another example, of consumer preference, is the idea of carbon & water foot print ~~of~~ caused in ~~the~~ primary produce production. Recently in the UK there was a large push to reduce the purchase ~~of~~ of NZ imported primary produce due to the significant carbon foot print it created producing them. This resulted in a drop in sales of NZ primary produce, effecting our market. However this claim was

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soon dispelled by professor Caroline Saunders, of NZ, proving that actually NZ primary produce made less of a carbon foot print than the UK farmers did producing the ~~same~~ same product, even after shipping it halfway around the world to the UK (from NZ). Even though this was a false accusation it brought to light the significance of consumer preference & the power they have to effect a products sales. ~~It brought to the~~ It made it evident to the NZ agriculture industry that meeting consumer demands was essential, especially over a contemporary ~~threat~~ threat such as carbon & water footprints. Farmers in NZ must then plan their management practises to minimise these factors, such as using precise irrigation systems, energy from re-newable sources or the use of slow ~~boa~~ boats to export our primary produce.

Because the agricultural industry has such an influence of NZ export earning & the economy & the well being of the country it is essential to keep it in a "good light". There are many ~~benefit~~ beneficial market potentials around the world & these need to be realised & negotiated with, to implment effective, fair & beneficial trade deals, & accomidated for to meet their market requirements. These markets are already being realised with ~~the~~ already signed FTAS with Singapore, Australia, China, ~~the~~ Thailand & Indonesia & we must focus on the markets which offer potential to NZ & establish effective ~~FFF~~ FTAS with them. These countries include negotiations which are presently occuring with Japan, India & in the trans pacific partnership. The importance of understanding other countries & their cultures is just as essential as meeting their non-tariff barriers. NZ is slowly moving away from being Britians "Food basket in the South pacific", & seeing the benefits of doing so. "Our future is partenering with countries in our region", John Key explained in a recent speech in China.

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QUESTION TWO (8 marks)

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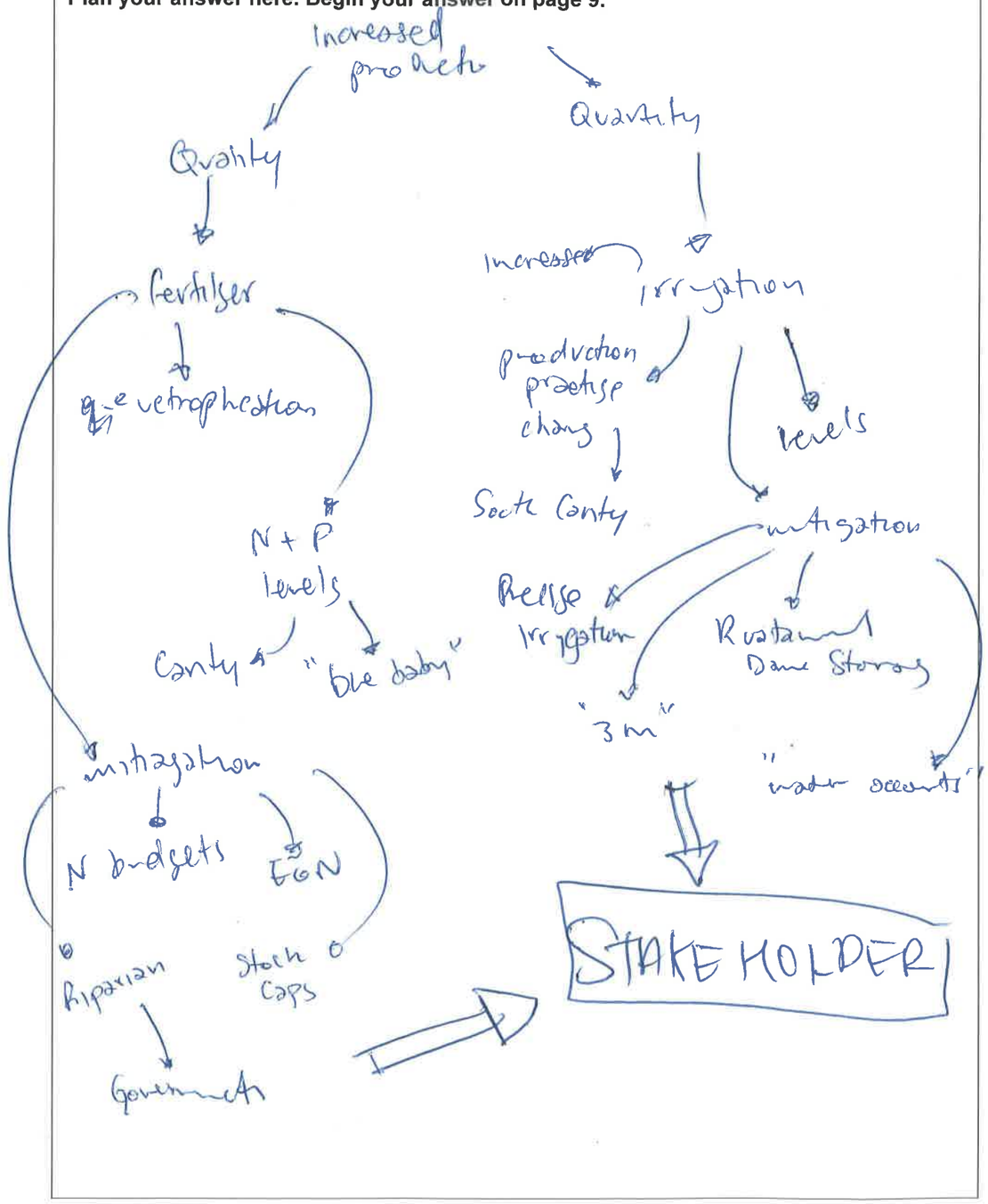
As agricultural and horticultural production systems intensify, the availability of high-quality water, and the management of nutrients, have become issues for a wide range of stakeholders.

Discuss these conflicts and perspectives in terms of the sustainability (economic, environmental, political, and social) of primary production systems in New Zealand.

Plan your answer here. Begin your answer on page 9.



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As the worlds population continues significantly to increase now at over 6 billion people, so does the worlds demand for primary products to feed this giant population." I believe the future of the world is not competing for the demand of high-quality products but striving to ensure there is enough to supply," John Key recently explained in a speech in China. This growing demand for primary products puts NZ in a significant beneficial position to help meet this supply. NZ relies alot on the export of primary products, with 60% of its export earnings coming from it. This therefore requires an increase in productivity in order to meet this ~~dem~~ growing demand. The fast developing rate of technology is assisting with this but at a cost. Increasing productivity often results in a means a negative impact on the environment. This has become evident recently in NZ, getting many stakeholder groups of the environmental issue worked up & vocal, even though the benefits of the increase in production have been huge.

~~Increasing~~ of increasing often comes through the increase in pasture or crop growth. This is usually obtained through the application of essential elements, such as Nitrogen (N) & Phosphorus (P), in the form of fertilisers, such as urea & super phosphate. However due to the increasing demand for an increase in primary production & the benefits of it fertiliser use has become excessive & irresponsible. When excess nutrients are applied to a pasture/crop the nutrients which the plants dont

use often end up ~~to~~ entering waterways surrounding the farm, through leeching (in the case of N) or ~~surf~~ run-off or erosion (in the case of P). ~~Pest~~ This damages the natural ecosystems of the particular water was through increasing eutriphocation rates & producing harmful toxins by ~~the~~ algae blooms. This in turn reduces fish & & subsurface plant life in the water ways & reduces oxygenation in the water. This therefore works up many stakeholder groups, such as fish & Game, & the general public as they can no longer use the waterways for swimming, boating or other recreational activities any more. Local Iwi & Maori also become very agitated as they hold a spiritual & cultural connection to the water & to see it down graded is a significant ofense to their culture & themselves. An increase of N & P levels in the waterways also has a significant impact itself. It is deemed that if N levels reach above ~~the~~ 11.3 mg/L ~~in~~ ~~or~~ or P levels reach above 0.5 mg/L the waterways are unsafe to use & drink from with the threat of disease, such as blue baby syndrome. This is an evident threat with dairy farms on average producing 40 kg of N leeching per hectare per year & market gardens producing 177 kg of N leeching per hectare per year. This has ~~resulted~~ resulted in many water ways around Canterbury ~~all~~ already reaching 10 mg/L of NZ &, through a recent government survey indicating 39% of waterways are unsafe for drinking from or swimming in. ~~Again~~ This ~~do~~ agrivates many stakeholder groups such as the public who cannot use many water ways

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for swimming, boating or drinking from any more &, again, local iwi who see their downgraded, sacred rivers as a huge offense to themselves.

The downgrading of water quality also significantly effects our export market & earnings. NZs reputation has been, for a long time, "clean & green," reflecting this in our quality primary produce. This has contributed to the success of our ~~agri~~ primary sector & can have a significant effect on it if it is damaged. With the emerging phrases, such as "dirty dairying", through the downgrading of our water quality they pose a significant threat to primary produce exports if the issue is not rendered.

Due to the significance of the issue the ~~are~~ many practises ~~processes~~ have been developed & put into place, some by the government, to mitigate against nutrient loss & down grading water quality. One is the planting & development of riparian zones, for mitigation of P losses into & waterways. The government have made it compulsory for all cattle farms (beef & dairy) to have riparian fencing completed by 2017 & riparian planting completed by 2020. Riparian zone establishment is however a costly & time consuming process. Farmers are also being encouraged to use Nutrient budget programmes, such as OVERSEER. These help reduce N, P & potassium (K) losses on farms by accounting for unique factors, environments & production requirements of your specific farm. It then ~~it~~ gives the farmer options for effective nutrient ~~applic~~ application practises to reduce

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nutrient loss, & helping the farmer ~~reduce~~ minimisse input costs by a reduction on money lost through loosing nutrients which they have applied while still retaining a high level of productivity. The future use of Econ is also evident, where N leeching rates are significantly reduced by its application over winter months when rain fall, & therefore leeching rates, are at their highest & plant uptake of nutrients are at their lowest. As Regional Councils are also developing stocking caps on land around the waterways, such as around lake ~~the~~ Taupo. These reduce Nutrient leeching into the waterways, & through the introduction of a "nutrient capping credits", it has been followed & a success with the farmers.

The ~~after~~ other prefelent issue & common ways of increasing productivity is through increased irrigation. Through the development of many technologies surrounding irrigation there has been a significant increase over the recent years. Irrigation in NZ has dripplet over the last 20 years to 700 000 hectares of irrigated land in NZ today. This has allowed for many ~~pas changes~~ farming conversions to occur to more intensive operations, to increase productivity. This is very evident in Canterbury with the significant number of dairy conversions occuring & the average revenue of farms in South canterbury increasing from $900/ha in 2005 to $2000/ha today, due to implimentation of more effective irrigation methods & systems. This has however had a significant impact of the

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environment & water levels around NZ. ~~Incre~~ Through the increased irrigation & irresponsibility of it, irrigating in excessive amounts & at the wrong times of the day & the year has decreased water levels. This is very evident over summer months, ~~when~~ especially droughts, when evaporation rate are the highest, rain fall is limited & therefore water is in its lowest supply however in great demand to maintain high levels of productivity. This again effect many stakeholder groups including the general public having less water to drink & use for hygenic purposes, less opperunity for recreational purposes such as boating & ~~swimming~~ swimming & fish & Canoe become very vocal with a reduced environment for aquatic life & therefore reduced opperunity to fish. Again Local Iwi & Maori become ~~very~~ angry & vocal over the issue as it is disrespecting their culture & taking our spiritual beliefs & water for granted when water is used irresponsibly & in excess. Other ~~the~~ farmers also become disadvantaged as they are trying to have access to water to retain high levels of productivity too.

The goverment & many other groups have realised the significance & threat of decling water quantity & implimented solutions to maintain & ~~resolve~~ resolve it. These include water storage schemes, such as the Ruataniwha Dam Storage Scheme in the Hawkes Bay. This is expected to store water for 30 000 hectare of irrigated land around the hawkes bay, to either increase the amount of irrigated land or increase intensity of existing irrigation. It is also expected to have significant social & economic benefits on the NZ & hawkes bay region by supplying 4500 jobs & predicted to increase

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QUESTION THREE (8 marks)

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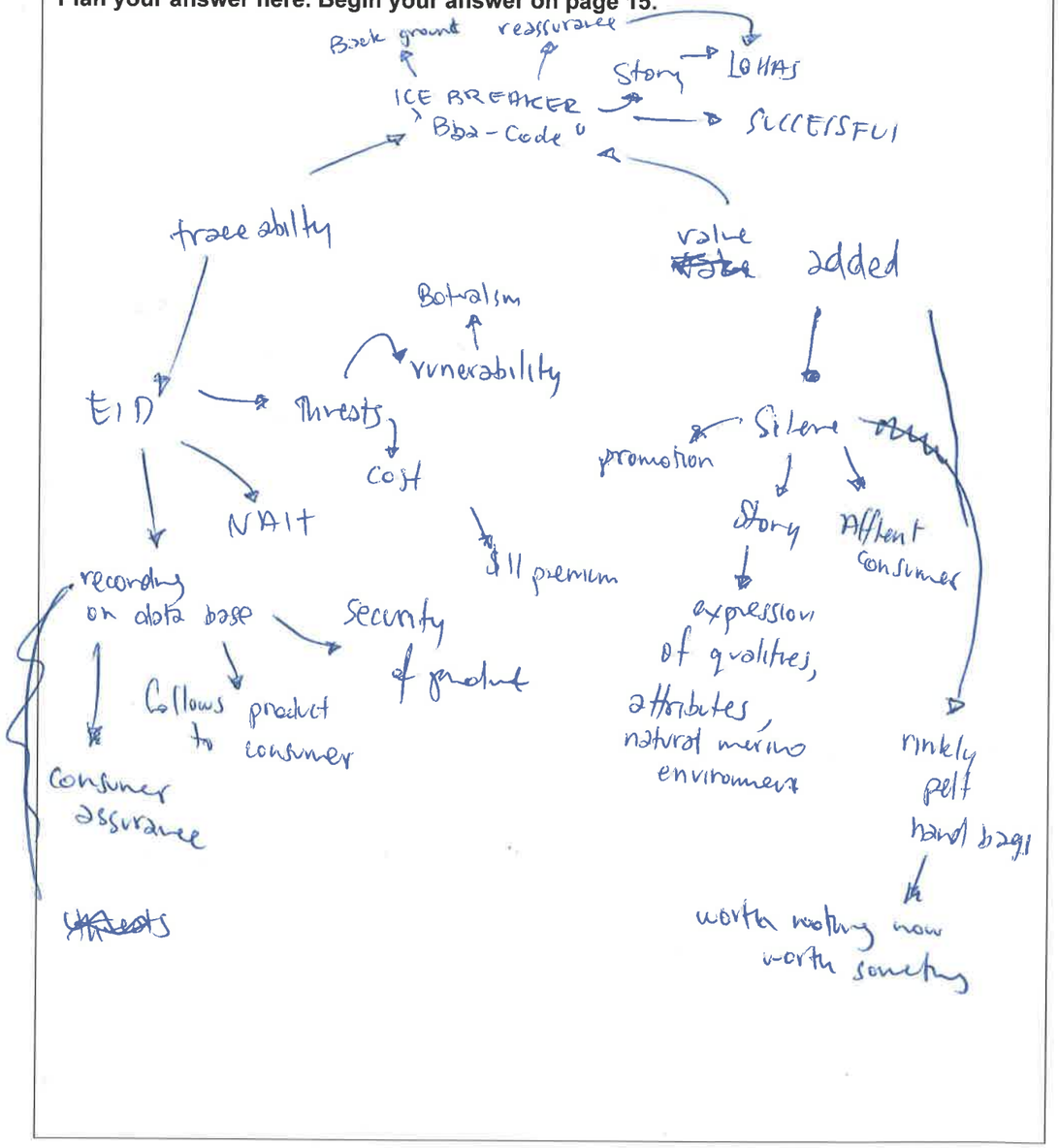
Choose TWO of the following contemporary issues:

- animal welfare
- biosecurity
- changes in land use
- traceability
- value added.

Critically analyse the **opportunities** and **threats** that the chosen issues present to the production of ONE nationally significant primary product, and how producers have responded to these opportunities and threats.

Plan your answer here. Begin your answer on page 15.



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Perception is reality for many consumers. This means that the image which we create for our products is significant. Due to the fact that primary products play such a key role in NZs export earnings it is key that we increase & develope the value & security of these products as much as possible. This is increasingly important when the price & demand for certain products drop, such as what has occured in the sheep industry in the form of lamb & wool in recent years. Lamb & wool prices have dropped significantly & the need to ~~revive~~ "revive" their market is becoming very preferlent. Lamb & wool is the image of NZ & our primary exports so the need to retain these markets is essential for our country. This effort is recently coming in the form of creating an image, & therefore increasing value, of sheep products & increasing its security & preference in the markets.

One method of maintaining a products value is through adding value to it. This can come from anywhere along the supply chain whether it be from adding an aspect to a product which is unique new & innovative, increasing the quality of the product or building an image of a product to increase consumer preference. Value added systems can also be a method of "reviving" a Struggling product in the market. An example of the value added ~~ideology~~ through the development of the Silere, merino product. Here merino lambs image was build expressing it as a unique, quality, ~~contemporary~~ contemporary product, almost completly indperdent from ordinary lamb. By advertising & promoting the meat through the use of celebrity chefs in NZ & internationally acclaimed

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restaurants this image of a high-quality, valuable meat was produced which appealed to the ~~affluent~~ affluent consumer. The natural farming methods & environment of a merino sheep in NZ were also expressed through advertising the ~~meat~~ Silere product. It was described as having a unique, gamey taste, being grazed on "alpine herbs & shrubs" & being grown in the "pollutant free, fresh, crisp mountaneous air of the Southern Alps of NZ". This all ~~contributed~~ contributed the building the image of this new Silere merino meat, setting itself aside from ordinary lamb & by using words such as Silere & merino instead of lamb & sheep. This therefore had a positive impact on NZs merino lamb exports, increasing the price received for them & the demand for it, reflecting back onto merino farmers giving them an extra incentive to ~~continue~~ continue to farm merino & a better out look for the future for merino farming. Another example of vale added is the development of high-end, designer hand bags from NZ sheeps ribby pelts. These pelts, which were previously worth nothing to the farmer, now had a value. This was increasingly beneficial to the farmer as they did not have to change their ~~management~~ management practises at all to produce this pelt. Through the realisation of market potential vale was added to the sheeps pelts, benefiting the farmer & NZs primary produce export ~~sales~~ returns.

The other systems, ~~of~~ which contributes to securing markets & the security of not only the individual

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product but the whole of NZs primary produce exports, is the intergration of many traceable systems into our primary products. Through encorporating traceability systems it reassures the consumer that they are receiving the product which has been promised & protects the product from ~~the~~ many threats of ~~the~~ todays large & diverse global ~~trades~~ trading system. These threats include false accusations of a product, ~~black~~ the sale of ~~geo~~ counterfeit goods & ~~goods~~ goods being sold on the black market. One production system which has ~~implimainted~~ traceibility into their production is the sheep farming operation. Electronic Identification (EID) tags, an electronic ear tag, have become available for sheep farmers. This requires them to record all practise which occur to ~~of~~ the sheep including things such as feed useage, drenching, on & off farm movements & the time & place of slaughter. This information is storred on a data base & stays with the carcase & cuts of meat from the individual animal right through to the consumer. This allows the traceability of a product right back to the farm it came from. This means that any problems, or issue the consumer has with the ~~meat~~ lamb can be resolved ~~quickly~~ quickly or justified & effectively & then rendered to protect the lambs sale on the global market & it also allows NZ to dispell any false accusations or counterfeit products which may put NZ in a bad light. This is increasingly evident in todays society of the influence of the media exposing & building up an issue. This ensures the farmer that their product has ~~eg~~ security in its market & that its reputation, & therfore sales, will not be tarnished easily.

~~However~~

However, through all the positive factors traceability can provide ~~that~~ it can also put NZ & its primary products in a very vunerable, fragile state. This is because the majority of products are now so easily traceable & if it is found to have an aspect wrong with the product it can be exposed & proven easily. This was evident with the recent ~~Bots~~ botvalism scare where NZ infant formula was suspected to contain the harmful bacteria, exposed through the ease of the infant formulas traceability system. Even though the scare was proved to be non-existant in NZ infant formula products it still lost trust in many of NZs international consumers of the infant formula, due to the danger it put their children in, which ~~has~~ must be rebuilt slowly over time. EID tags also have a negative view by farmers through the increase production practises of recording information & scanning the sheep & the purchasing of the EID tags. However this is proven to be beneficial with farmers who use EID tags around NZ recieve an average premium of $11 per carcase due to the manipulative abilities of genetics & good management practises they recieve through the use of EID tags. National Animal Identification tags (NAIT), ~~those~~ which are similar to EID tags, have been compulsory for Deer & Cattle in NZ & have proven to be beneficial for both those production practises.

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Both traceability & value added systems can both be encorporated into a product, to bring significant financial benefit. An example of this is Ice-Breakers woollen garments & the incorporation & innovative development of the "Baa-Code". A "Baa-Code" is a unique # code to every individual garment which allows the consumer to go onto the Ice-Breaker website & type in ~~the Code~~ "Baa-code". It then shows the consumer ~~all the~~ information about the woollen garment which includes the farm which the wool was produced on to make the product, information about the farm, ethical (in relation to both animals & people) considerations which went into the manufacture of the garment & ~~environmental~~ how environmental factors are maintained & of importance in the garments manufacture. By providing this traceable system it ~~does~~ ~~also~~ allows the consumer to believe in the product & believe everything it is promising. It makes them ~~feel~~ feel better about their purchase & increases consumer preference as it appears to be a superior, top-quality product. The traceable "Baa-Code" also ~~adds~~ value to ~~the~~ Ice-Breakers woollen garments by creating & & supplying the consumer with a story about their garment. It allows them to feel connected to not only the garment but the farm it was produced on, the animals it was produced by & the environment it came from. By adding the connection to the outdoors environment, where it was produced & how the garment can be used, along with the reassurance of good ethical & environmental practises ~~the consumer is~~ the Ice-Breaker garment connects to the LOHAS consumer who are

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QUESTION NUMBER 3

willing to pay more for their product, by ~~with the~~ knowing their purchase was the "right one." This incorporation of traceability & value added systems into the Ice-Breaker garments has contributed to them being such a prestegious, innovative company in the way of woollen garments. It has increased the value ~~value~~ (price) of their products as well as the sales which has contributed to them being such a successful, profitable business operation.

primary
NZ ^ products must start to focus their attention on developing their value & image in order to increase & maintain high returns for our export sale. The importance of traceability must also be realised increasingly, as it is now, to provide primary products with security, especily in the modern world where the consumer can ~~can~~ afford to be picky ~~with~~ due to the range of products they have a choice of. The benefits which can be gained from traceability & value added are emense, reflecting right back on NZ, being such a reliant country on primary produce exports. Because of NZs majority of primary products ~~major~~ being premium market suppliers it increases the need of security & increasing value of our products. The risk of vunerability & fragility traceability systems can ~~place~~ place NZs primary products in cannot be ignored, but the benefit the agricultural industry & country as a whole can

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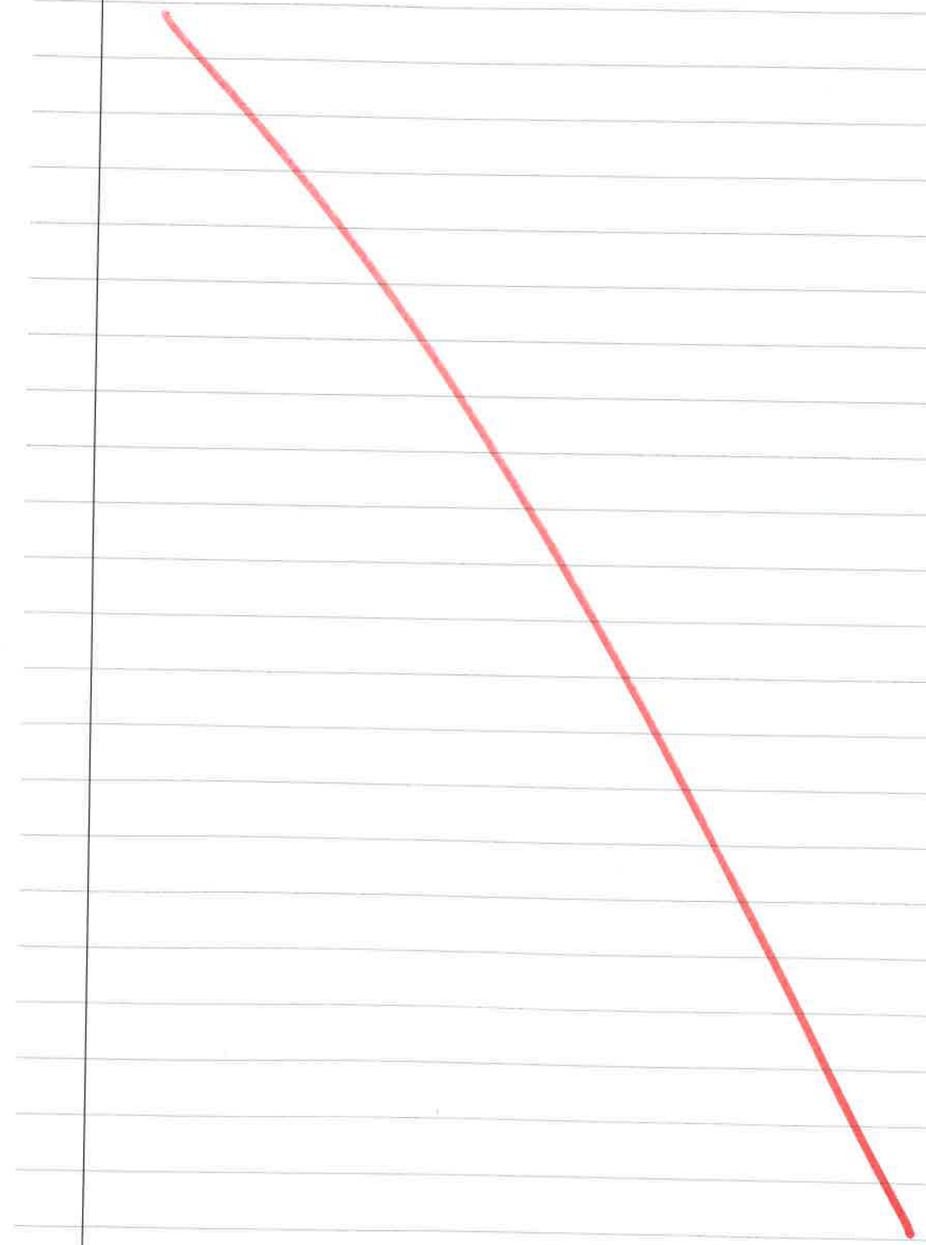
QUESTION NUMBER 3

~~gain~~ gain is also so immense that these systems cannot be dispelled & ~~forgotten~~ ~~forgotten~~. foregotten.



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which NZ hold of a pristene, natural environment. This, again, also reflects & helps in the success of NZs agricultreal exports & consumer preference. Even though NZ is faced with a significant opportunity to supply the growing populations demand for an increase in primary products it is equally important to ~~el~~ maintain our own country in the proccess. ~~Whether~~ whether it be to keep stakeholder groups, domestiely & ~~ted~~ internationally, ~~qreit~~ quiet or to firmly establish our image & example of natural environment. There is a close relationship between water quality & quanitity where if quanity is reduced then the concentration of nutrients in waterways is also ~~reduced~~ increased, down grading water quality. This means that the ~~significant~~ significance of maintaing both is key. Farmers, from a range of different practises, & many different stakeholder groups & the NZ government must come together in the future, accomidate for each others desires & work effectivly to resolve the issue of water quality & quantity in NZ.

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NZ's GDP by $250 million*. Other solutions encourage better management practises by the farmers including the use of precise irrigation systems where water useage can be accurately recorded & manages, such as through the use of pivot irrigators rather than boarder dyke irrigators. The "3m" system is also availble where an aqua flex tape is used to measure the soils plant-water moisture levels. If it drops below 30%. irrigation should be applied until it reaches 80%. when irrigation should cease. This ensures less water is lost before plants can use it while soil moisture still remains high for plants to use, retaining a high level of productivity. The government has also put it on regional councils to impliment "water accounts" where people must pay for a certain volume of water which they can extract & use. This ensures that water levels in waterways can be retained at a sustainable level &, in the hope of water having to be purchased, people will use their water more responsibly. Issues exist with this method however over who gets priority over the purchase of the water accounts & how to measure individuals extraction.

*Maori have some negative views on these water storage schemes as many believe it is not right to mix water from different water ways, as it is effectivly mixing spirits & disrupting the natural way of life

It is however essential to retain high levels of water quantity & quality to maintain the natural ecosystem of NZ. Not only to ensure a sustainable ecosystem but to retain the values

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