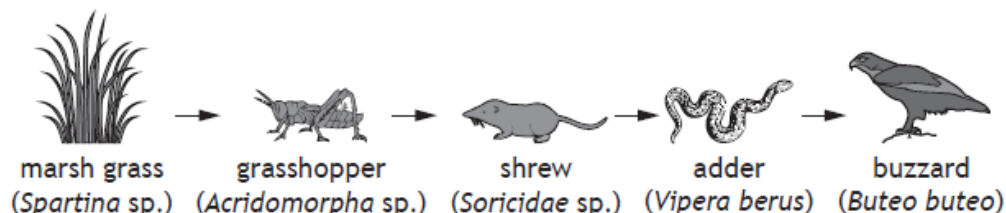MARKS

Total marks — 100 marks

Attempt ALL questions

Questions 8 and 9 each contain a choice

1. A typical Scottish marshland food chain is shown.

marsh grass   grasshopper   shrew   adder   buzzard
(*Spartina* sp.)   (*Acridomorpha* sp.)   (*Soricidae* sp.)   (*Vipera berus*)   (*Buteo buteo*)

(a) Marsh grass is a green plant that produces biomass.

(i) A green plant that can produce its own biomass can be referred to as a producer.

State one other term that describes such an organism.   **1**

Example

Primary producer

(ii) Suggest the season in which green plants will produce the most biomass.

Explain your answer.   **3**

Example 1

Summer as green plant get the most sunlight during this time of year. During this time they photosenthesize the most, it is also the time where animals and all organisms and micro-organism are seen the most out of their homes as it is warmer weather, during cold/winter they shelter. These organisms will feed onto green plants which would release nutrients supporting into the soil → keeps the soil formation. = therefore produces more green plants

Example 2

the spring, due to warmer temperatures and more sunlight, resulting in more grass being produced, animals also grazing which helps cut down other of on dominant plants. Meaning more space, sunlight and water for the green plants.

Example 3

green plants produce the most biomass in spring because this is the season with the most sun and rain, ~~so is/also~~ so they are able to photosynthesise more It is also the season that plants start to grow more.

(b) The ecological efficiency in a food chain can be calculated.

   (i) Define *ecological efficiency*.   **1**

Example 1

The amount of energy that can be passed on to between trophic levels.

Example 2

the ~~trophic levels~~ amount of energy used between each trophic level.

   (ii) 5 000 000 kJ m–2 of energy falls on the marshland ecosystem.

5% 8% of this energy is assimilated by marsh grass.

The grasshopper then consumes the marsh grass, assimilating 6% of the available energy.

Calculate how much energy the grasshopper assimilates from the marsh grass.   **2**

Example

5 000 000 $\times$ 0.08 = ~~6350000~~ 400000

~~62500000~~ $\times$ 0.06 = 24000

(iii)   Explain why only a small percentage of energy passes to the
       next trophic level.   **1**

(c) Areas of Scottish marshland are under threat from human activities.

Rewilding practices, such as the reintroduction of native species,
have been used to initiate or accelerate the recovery of habitats or
ecosystems.

State two other activities used in rewilding.   **2**

Example 1

Afforestation - where
trees are planted.

Reintroduction of non-
native species

Example 2

two other activities used in rewilding
is protecting land and making sure
that it not disrupted by human activities

Another activity to introduce rewilding
is to . Stop habitat fragment y cutting
down trees and isolating the species in
one area this would help reduce the
species population endangering them.

Another activities is due to motor way
disturbence it creates habitat fragments
to stop aa species from being
isolated ov getting killed by cars
when wanting to go to the otherside
create

Example 3

reintroduction of natural predators to control
populations of species that are out of hand.

MARKS

2. The Earth's internal heat drives the system of currents circulating in both the mantle and the core.

(a) (i) State the name given to describe these circulation currents.   **1**

Example

gyre)

(ii) Explain how the Earth's internal heat drives the movement of material within the mantle.   **2**
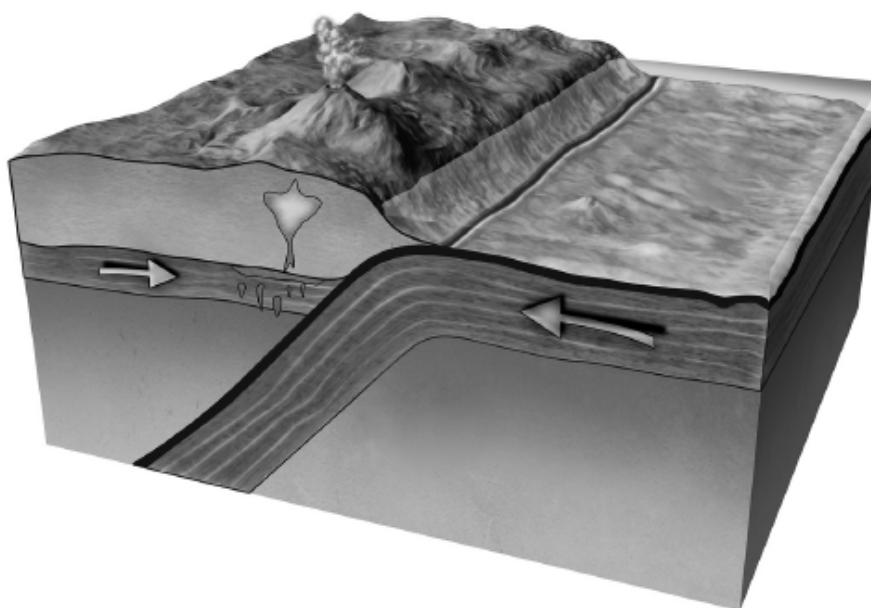
Example 1

Earths heat causes the convection currents to happen, and therefore material is moved throughout the mantle.

Example 2

When the material is heated by the earth then it moves closer to the surface and cooler melted rock is pulled down to replace it until it becomes hot enough and travels back up to the surface.

(b) The circulation patterns are responsible for plate tectonics. The diagram shows the interaction of tectonic plates at a subduction zone.

(i) Name the type of plate boundary shown in the diagram.   **1**

    (ii)   Describe the processes occurring at a subduction zone that result in volcanic activity.

4

Example 1

when the heavier oceanic plate goes underneath the continental plate a subduction zone is created which brings down sediments from the sea. A subduction zone has high levels of explosive gas present which causes the magma to rise through faults in the earths surface and explode as a volcano.

Example 2

the oceanic crust moves under the continental crust, resulting in a subduction zone. Magma rises through faults in the earths surface as volcanoes. if the magma cools outside the earths surface it is known as extrusive rock, if the magma cools inside the earth's surface it is known as intrusive rock.

(c) Ores rich in aluminium oxide are found in extractable quantities in areas associated with subduction zones.

    (i)   Name an ore that is rich in aluminium oxide.   **1**

(ii)   Smelting is a process by which metal is obtained from its ore by heating it beyond the melting point.

Explain one environmental issue associated with the smelting of aluminium-rich ores.   **2**

Example 1

The ore has to be transported to the smelting site through the use of combustion engines which emmit CO_2.

Electrolysis is a process used to smelt which uses up lots of energy, due to the high melting point.

Example 2

· gives of ~~green~~ greenhouse gas(es)

· ~~Needs~~ requires a lot of energy.

(d)   Villarrica, a volcano located in a glaciated area in Chile, erupted in 2015. The eruption had a major impact on the hydrosphere and other Earth systems.

Suggest one possible impact of a volcanic eruption on

(i)   the hydrosphere   **1**

Example 1

Volcanic ash/dust getting into local bodies of water/ rivers which causes contamination

Example 2

gases given off and rocks and dust being launched into ~~water~~ nearby water

(ii)   natural climate change.   **1**

Example 1

can cause a short period of cooling as dust particles block out sunlight.

Example 2

harmful gases given off

(e) Natural climate change has both long-term and short-term impacts.

Explain a social impact of a prolonged period of hot, dry weather.   **2**

Example 1

This type of weather will cause droughts which will limit the growth of crops. This means there will be less availability of ~~food~~ some food products.

Example 2

· causes droughts

· ~~and~~ crops will die

· decreases crop growth

MARKS

3.   A town in India has built a sewage treatment facility to reduce the volume of untreated sewage being released into waterways.
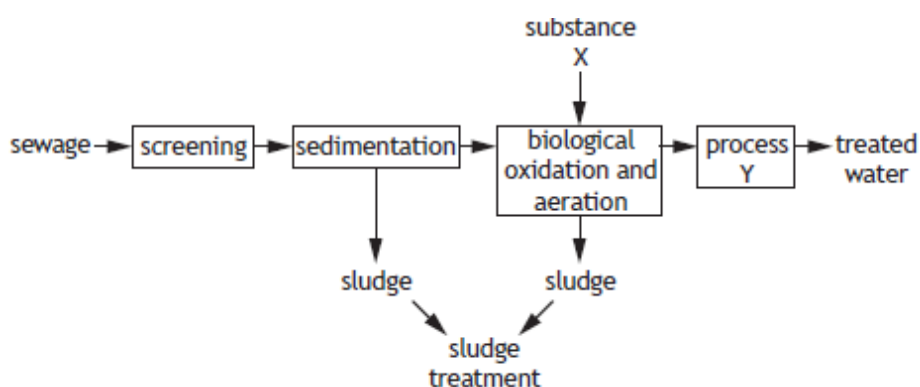
(a) State the term used to describe the liquid part of the waste material.   **1**

Example

sewage

(b) At the sewage treatment facility, sewage goes through a series of processes before being released back into the environment.

The processes are shown in the flow diagram.

(i)   Using information in the flow diagram, identify

(A) substance X   **1**

Example

effluient

(B) process Y.   **1**

Example

terbiary treatment.

(ii) The preliminary stage involves the screening process.

Describe what happens to the sewage during this process.   **1**

Example 1

Big lumps are removed

Example 2

the sewage gets screened so all
of the large clumps ^of waste can't go any
.further.

(iii)   Describe how the sludge can be treated in order to produce a named resource.   **2**
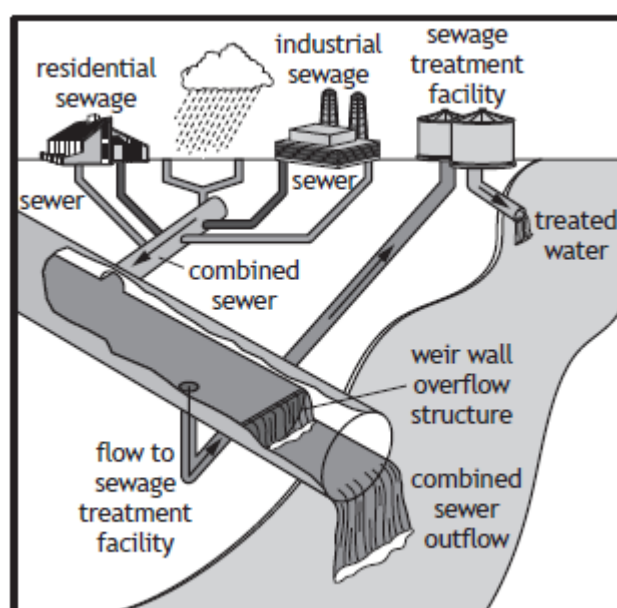
Example 1

Sludge can be broken down over time by microorganisms/bacteria. The breakdown of this causes the gas methane to become present which can be harvested and sold

Example 2

heat it to kill the bacteria off

or add chemicals to kill bacteria.

(c)   During periods of heavy rainfall the sewage system occasionally overflows, leading to high volumes of untreated waste being released into the river.

The sewage system during heavy rainfall is shown in the diagram.

(i)   The diagram shows liquid waste material being discharged from the combined sewer outflow into the river.

State whether this is an example of point or diffuse pollution.

Justify your response.   **1**
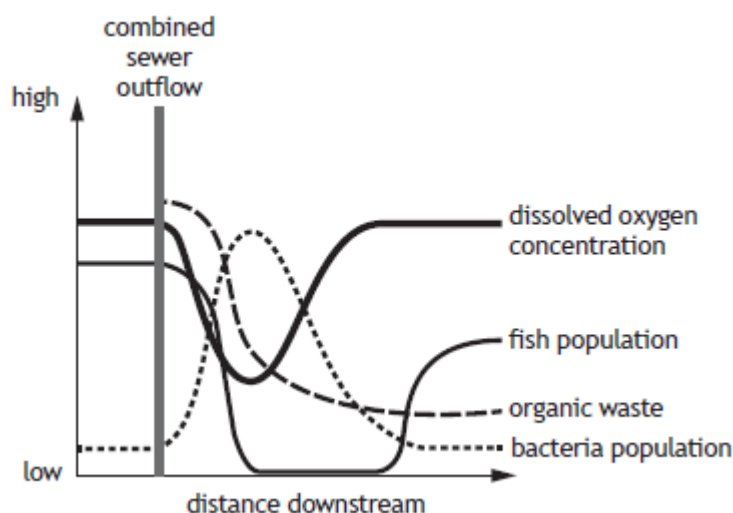
Example

Type of pollution

diffuse

Justification

it's difficult to tell ← where

the pollution is coming from, due

to the mixing of ← the treated

water and the sewage down stream.

(ii) Untreated waste was discharged into the river during a period of heavy rainfall.

Environmental scientists measured four factors along the river: dissolved oxygen concentration, fish population, organic waste, and bacteria population. The trends are shown in the diagram.

Using all the information in the diagram, explain the reasons for the trend in fish population.   **4**

Example 1

As the bacteria population rose
downstream this caused the
fish population to plummet because
the oxygen concentration was too
low to sustain the fish demand.
Further downstream once the
organic waste had been broken
down, this caused the bacteria
population to decline which meant
the oxygen concentration ~~was~~ *increased*
which meets
the fish demand

Example 2

a) the dissolved oxygen concentration decreased so did the fish population due to the sewer outflow causing an algal bloom, which increases the bacteria population. As you go further down the stream the sewer outflow isn't as concentrated to organic waste, and not dissolved oxygen concentration, fish population and bacteria population go back to normal. The bacteria increase when the sewage is in the water whereas the other factors decrease.

Example 3

As the dissolved oxygen concentration decreased so did the fish population decrease drastically however, as the dissolved oxygen concentration increased the fish population increased Another affect the distributed to the fish population decreasing organic waste bacteria popula was incredibaly high, this created algae on the top layer of the river blocking out sunlight therefore less oxygen was in the niver for the fish population. Hen Blocking out the sunlight would create diseases reducing fish population.
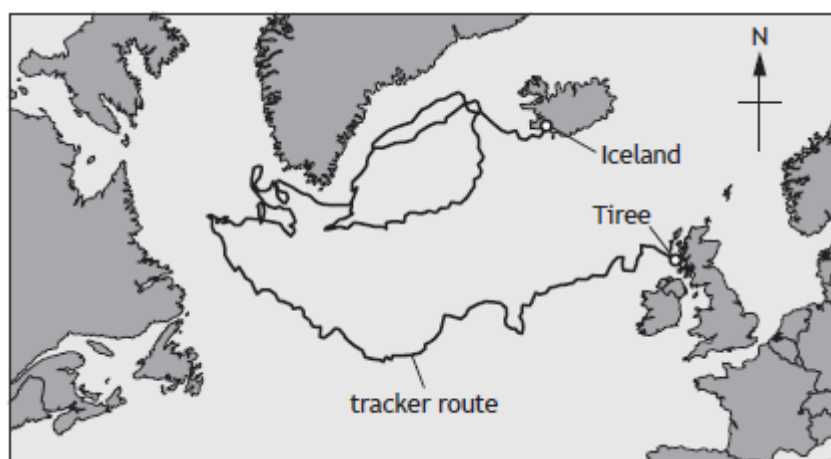
MARKS | DO NOT WRITE IN THIS MARGIN

4.   Marine scientists studying ocean currents in the North Atlantic released a tracker device from the southern shores of Iceland in January 2016.

The tracker was discovered on the Isle of Tiree, Scotland in January 2017.

The map shows the path the tracker travelled.

(a) (i) Name a factor that can influence oceanic circulation.   1

Example

~~surface winds~~   ~~coriolis effect~~

(ii) Explain the effect the factor named in (i) has on oceanic circulation.   2

Example 1

~~the winds can blow the oceanic~~
~~circulation of course.~~

~~the coriolis effect, effects the~~
~~air direction of oceanic circulation.~~
~~In the southern hemisphere it~~

the surface winds can change the
direction of ~~surface~~ an oceanic circulation
and cause it to flow another way, causing
the ocean circulation ~~nor~~ it to go round the
~~land~~ ~~causing it to change direction~~
                              it to go off

Example 2

As freshwater is drawn out
the saltier water becomes
heavier. New water rises
to replace the salty water
which sinks, this creates
a current.

(b) The table shows the distance the GPS tracker travelled each month.

Month	Distance travelled (km)
1	1653
2	1448
3	1428
4	1135
5	883
6	841
7	879
8	892
9	1097
10	1536
11	1096
12	1727

Calculate the mean distance travelled by the tracker each month.   **1**

Example

14615 ÷ 12
= 1217. 916
1218

(c) Ocean gyres often trap and accumulate large volumes of waste. The
Great Pacific Garbage Patch located off the west coast of North
America is the largest of these.

The diagram below shows the approximate location and size of the
Great Pacific Garbage Patch.

garbage concentration
kilograms per square kilometre

0·1   1   10   100
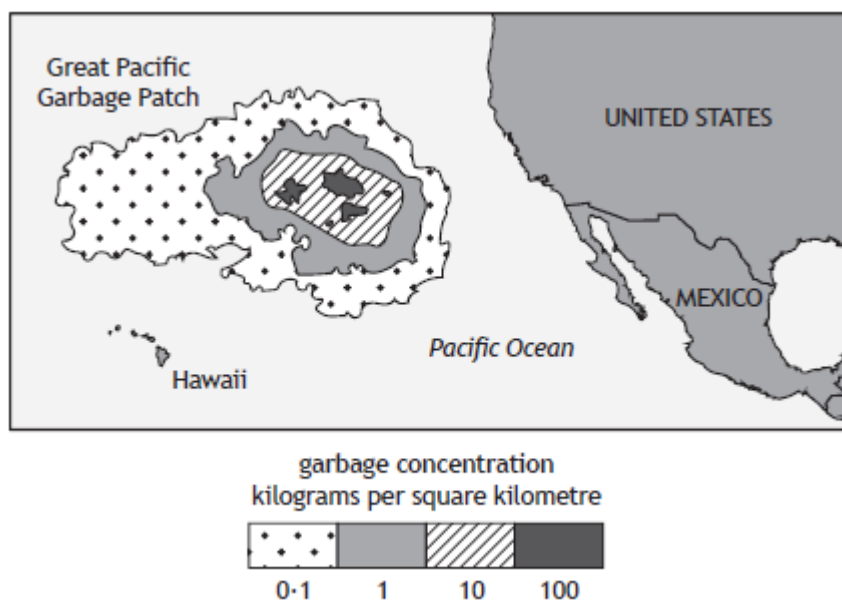
(i) Define the term *ocean gyre*.   **1**

(ii) Suggest why there is a greater concentration of garbage towards the centre of the patch.   **1**

(iii) A study in 2018 investigated plastic waste circulating in the Great Pacific Garbage Patch. The estimated composition of this waste is shown in the table.

Type of plastic	Size (cm)	Number of items per km^2
Micro-plastics	<0·50	678 000
Meso-plastics	0·50–5·00	22 000
Macro-plastics	5·01–50·00	690
Mega-plastics	>50·00	4

Calculate the percentage of the total waste per km^2 made up by plastics less than 5·01 cm in size.   **1**

Example

678 000 + 22000

= 700000 total waste < 5·01 cm

total waste = 700694

700 000 ÷ 700694 × 100 = 99·99 99 %

(iv) Plastics in the Great Pacific Garbage Patch have been assessed since the 1970s, and the research shows that the proportion of micro-plastics is increasing.

Suggest why marine micro-plastics are increasing over time.   **1**

Example 1

because of bioaccumulation.

Example 2

population increase
More people are consuming more products
at a rapid pace, such as fast fashion, plastics,
unsustainable product = population increase - more population
demand.

(v) Explain an impact that plastics accumulating in a marine environment will have on biodiversity.   **2**

Example 1

It will have a negative
impact as marine life
will mistake plastics
for food which can kill
them. This will cause
bioaccumilation which
can kill species further up
the food chain.

Example 2

it will impact populations if more
plastic is being consumed by organisms.

it will also destroy habitats if

there is a build of plastics, causing their

habitats to be inhabitable.

Example 3

An impact would be that the micro-plastics
found in the sea are consumed by
th marine species, this have has a
derramentle affect on them, as it can
sufficate/kill/shorter life-span on the
marine species = thus decreasing biodiversity
.

MARKS | DO NOT WRITE IN THIS MARGIN

5. Crop production depends on physical factors, including availability of arable land, as well as consumer demand and economics.

The table shows global yields of major crops by year.

Crop	Global crop yield by year (million tonnes)				
	2010	2012	2014	2016	2018
Wheat	275	273	292	300	267
Maize	418	375	482	499	477
Soybean	97	90	116	127	137

(a) Using information from the table, draw a line graph to show the crop yield for maize between 2010 and 2018.

3

Example 1:

Maize

Example 2:

WHEAT ———

MAIZE — — —

SOYBEAN —.—.—

Example 3:

Global crop years Global crop yield
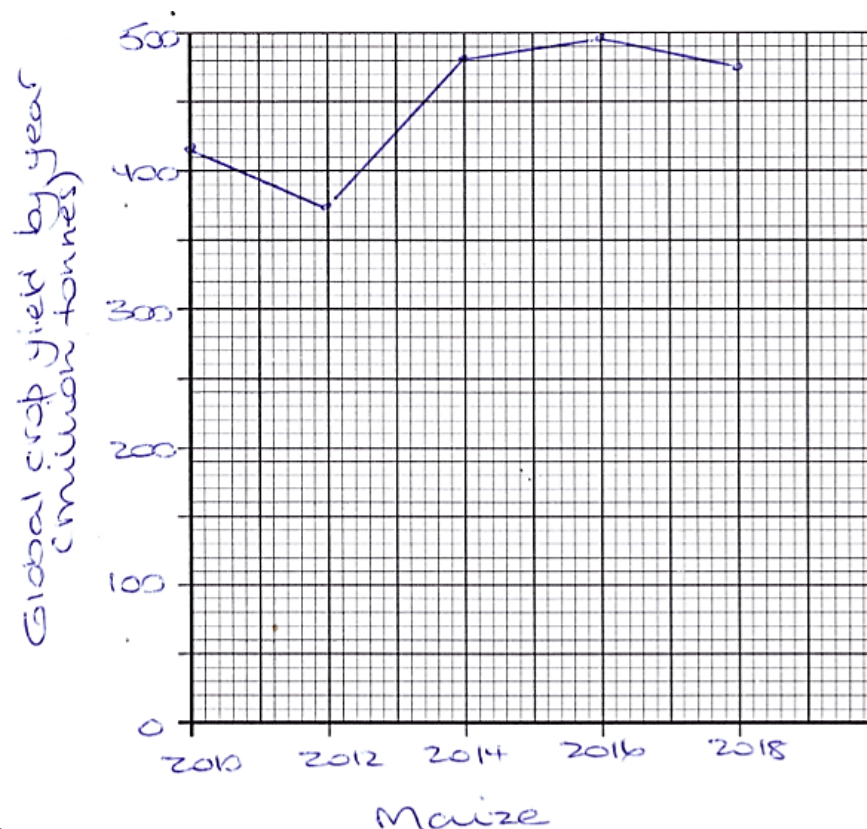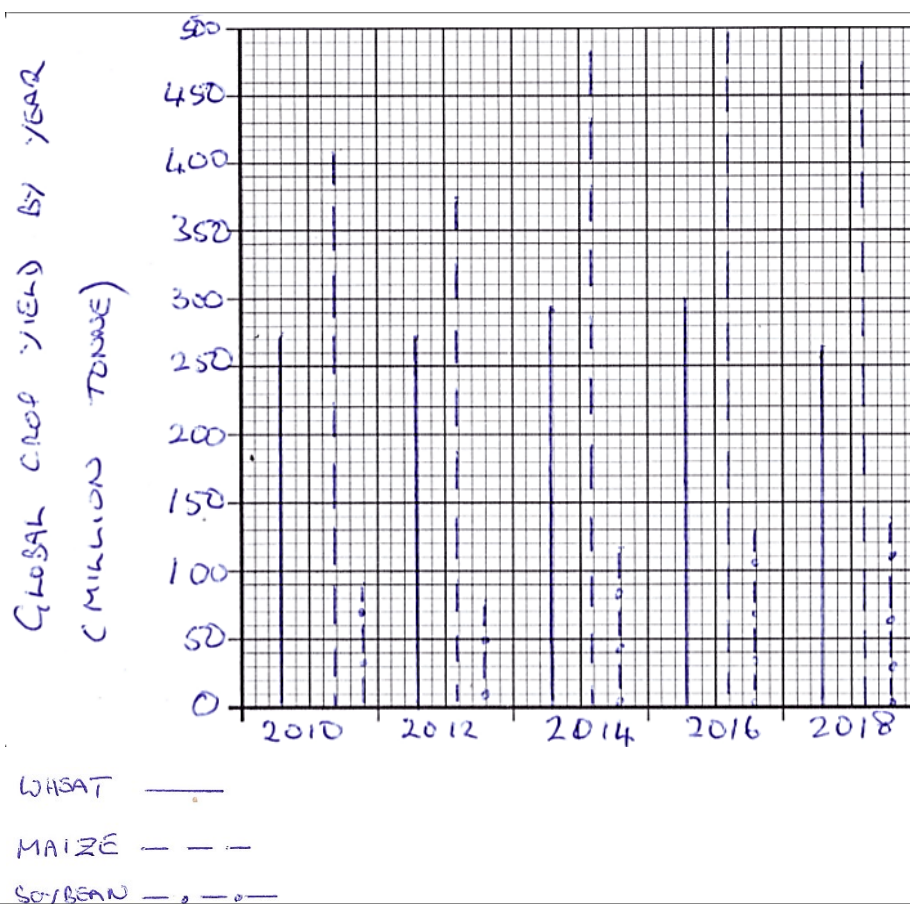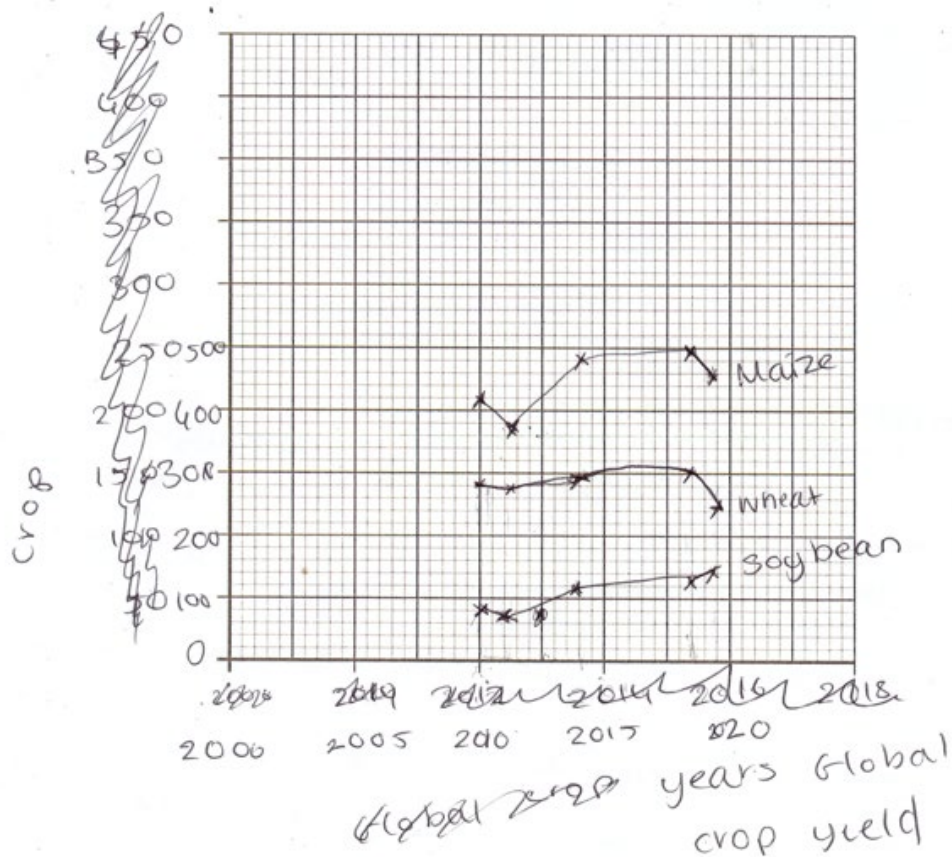
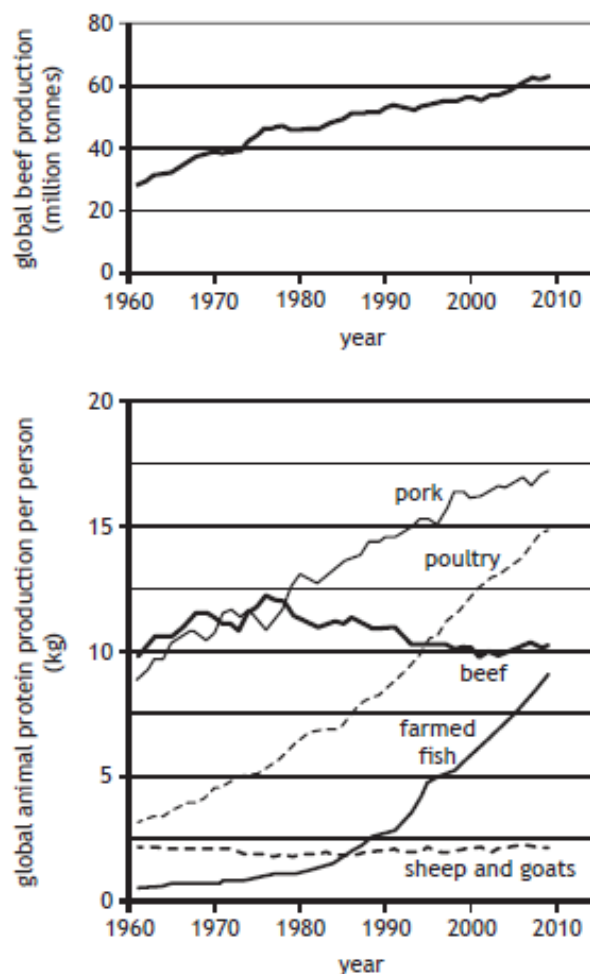(b) Suggest a reason for the change in global wheat yield between 2016 and 2018.   **1**

(c) Global consumption of animal protein is on the rise.

The graphs show global been production and global animal protein production per person between 1960 and 2010.

(i) Explain the difference in the trends in beef production shown in these two trends. **2**

Example 1

Beef production is increasing in the first graph. whereas in the 2nd the proten production per person is slowly decreasing.

Example 2

in graph one from just after 1960 to 2010 global beef production increases but in graph two from just after 1960 to 2010 the global animal protein production per person isn't increasing as much as other mean.

(ii) Between 1960 and 1980, the trends for beef and pork production per person were similar.

Suggest a reason for the change in the trends of global beef and pork production per person after 1980. **1**

Example 1

Pork ~~was~~ is cheaper to produce.

Example 2

They became more well known later on in the years and people want to try them becoming more popular.

(d) Meat production per person is predicted to increase significantly in developing countries.

Suggest two reasons for this prediction.   **2**

Example 1

1   increasing population

2   ~~et~~ increasing migration to different countries.

Example 2

1 Increase in demand for meat as a preffered food source.

2 Meat is a more expensive food source.

(e) Meat production accounts for an estimated 15% of anthropogenic greenhouse gas emissions, including methane and nitrous oxide.

Other than meat production, name an anthropogenic source of

(i)   methane   **1**

Example

Steam methane reforming in the production of hydrogen as a fuel source.

(ii) nitrous oxide   **1**

Example 1

burning of dead livestock

Example 2

cars and ~~bus~~ vehicles

	MARKS	DO NOT WRITE IN THIS MARGIN

6. Alternative sources of energy are being explored to replace fossil fuels. Hydrogen is one such fuel.

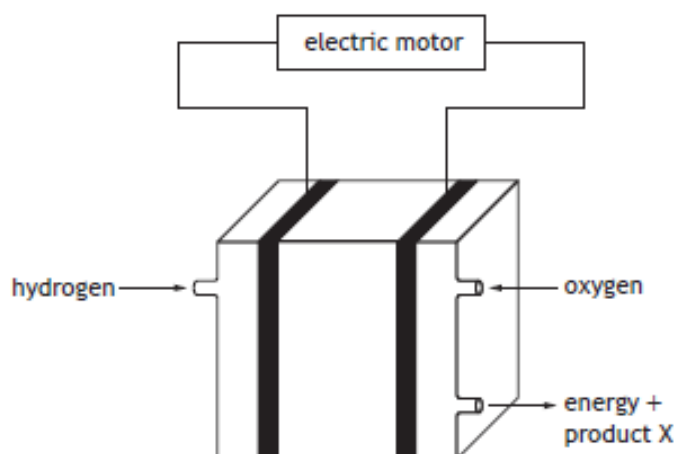(a) (i) Name one method of producing hydroen for use in fuel cells.   **1**

(ii) Describe this method of producing hydrogen.   **2**

Example

This is where the cells are split into two. Hydrogen and oxygen.

(b) Energy can be generated from hydrogen using a fuel cell, as shown in the diagram.

electric motor

hydrogen ⟶

oxygen ⟶

⟶ energy + product X

(i) Name the substance represented by product X in the diagram.   **1**

(ii) Describe how a fuel cell generates electricity.   **1**

Example 1

Hydrogen + oxygen react together this creates energy, with the only by product being water.

Example 2

oxygen + hydrogen is put into the fuel cell, the electric motor, helps bind the two chemicals together to produce energy.

(c) Explain why generating electricity from hydrogen may not be considered environmentally sustainable.   **2**

Example 1

It may come from sources such as burning natural gas, . which emmits carbon.

If it comes from electrolysis the energy to power this may not be renewable.

Example 2

. it uses a lot of ~~energy~~ energy electricity

> expensive to ~~make~~ run

. ~~hydrogen~~

(d) A fuel company is considering installing fuelling stations throughout the UK for hydrogen-powered vehicles.

Describe two advantages of using hydrogen as a fuel.   **2**

Example 1

Hydrogen fuel cells can be re pelled quickly.
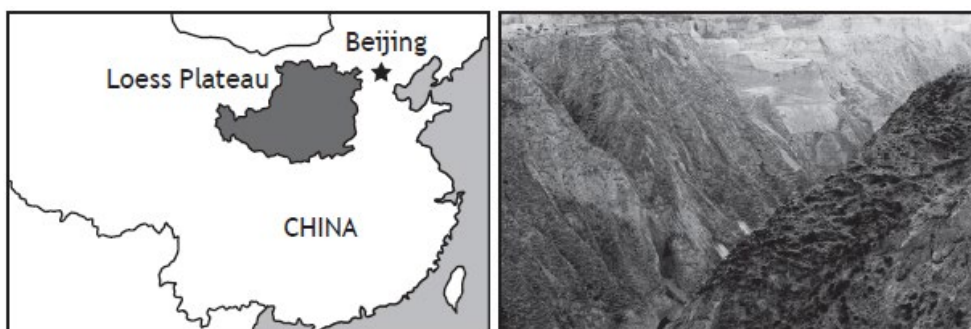
Hydrogen power does not emmit any greenhouse gasses.

Example 2

. renewable

. if there is a spillage it will be less damaging than ~~normal~~ fossil fuel.

. ~~less~~ produces less pollution than ~~normal~~ fossil fuels.

	MARKS	DO NOT WRITE IN THIS MARGIN

7. The Loess Plateau in China is one of the most severely eroded areas in the world.

Around 80% of the area has been affected by exposure to strong winds and heavy precipitation, deforestation, uncontrolled grazing, and agricultural cultivation on the steep slopes.

The erosion is a constant threat to the livelihoods of rural families and a major problem for the ecosystem and environment.

(a) Loess is composed of wind-blown silt sediments. Loess deposits in this area can be as much as 330 metres deep.

Name the type of weathering that leads to the formation of loess deposits.   **1**

Example

chemical weathering

(b) In 1986, the Chinese Government introduced a plan to reduce the impacts of erosion on the Loess Plateau and to improve the ecological environment. One way of doing this was the trial planting of different types of trees and shrubs.

(i) From the information above, identify

(A) a policy   **1**

Example

reduce the impacts of erosion and improve the ecological environment

(B) a strategy   **1**

Example

Plant different types of trees and shrubs.

(ii) Suggest why planting was undertaken rather than allowing
      natural succession to proceed.   **1**

(c) *Caragana korshinskii* was found to be one of the most successful plant
     species in the trials. It is a native desert shrub with strong drought
     resistance. It is also a leguminous species, able to convert
     atmospheric nitrogen into a form that can be used by plants.

   (i) Nitrogen content of soil is an edaphic factor.

        State what is meant by an *edaphic factor*.   **1**

        Example 1

        Something which is in
        the soil

        Example 2

        is a factor that makes up the soil.

   (ii) Explain why soil nutrients such as nitrogen are important in terms
         of reducing erosion.   **2**

        Example

        . the more compact the soil is with
          nutrients the ~~more~~ less likely it is
          to erode.
        . the nutrients might take ~~away~~ to ~~react~~ ~~soil~~ a while break down
          ~~from~~ once ~~being~~ ~~react~~ interacted with water so
          erosion takes longer to occur.

(d) Slope can directly affect soil condition and the vegetation it can
     support.

     Describe a method for measuring slope.   **2**

     Example

     Using an inclineometer.
     Set up the equipment at
     the . top of the slope
     and ^one at the bottom to
     tell you the measurement.

(e) Researchers assessed the effect of slope on microbial biomass carbon content of soil at four different sites on the Loess Plateau.

Microbial biomass carbon is a measure of the carbon contained within soil bacteria and fungi.

The slope had been planted with *Caragana korshinskii* 35 years ago.

Systematic sampling was used to locate four 100 m × 100 m sites (A, B, C, and D). At each location, random point sampling was used to collect soil samples at three depths: 0–10 cm, 11–30 cm, and 31–60 cm.

The diagram shows the location of sites A, B, C, and D.

(i) Suggest why the soil samples were collected at three depths at each sampling point and across each site.   **1**

Example

to ensure realiability and to
get a range of ~~of results~~ ensure
~~allow from~~ to get different range of
~~results~~ and to see wether there was
~~was~~ more microbial biomass carbon
on the surface of the soil or deeper
into the soil. To see if the depths
had an effect on the amount of
microbial biomass carbon ~~found.~~ present.

(ii) The microbial biomass carbon content of each soil sample was determined. The results are shown in the graph.
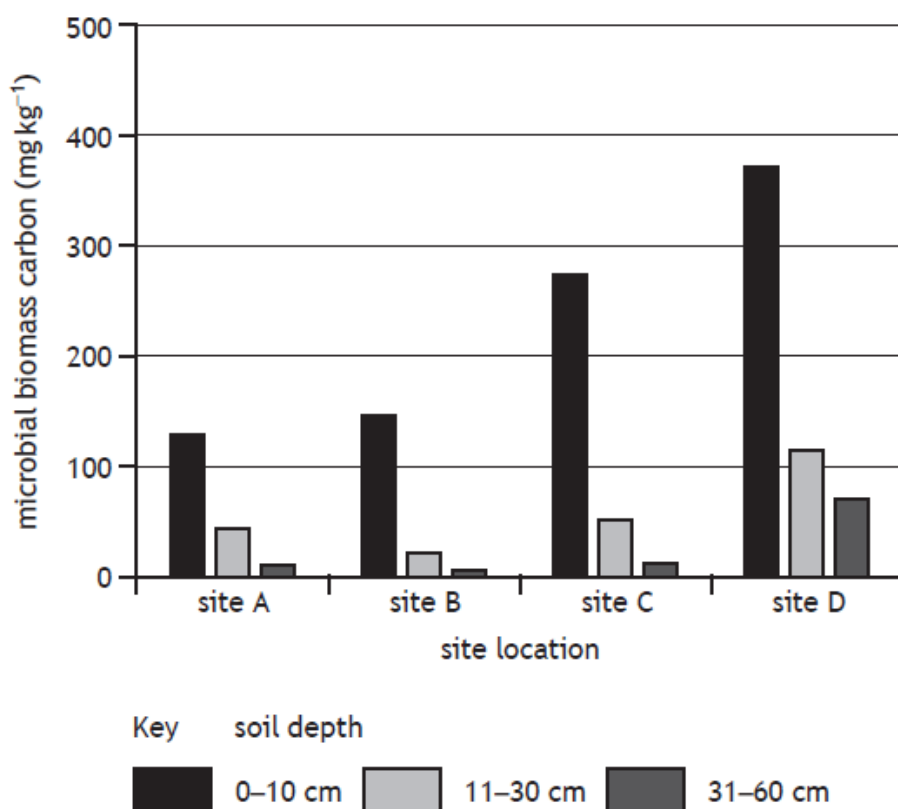
Using the information in the diagram and graph, describe two trends shown.   **2**

Example 1

1 As the elevation decreased the microbal biomass carbon at 0-10cm increased.

2 As the elevation decreased the general trend of microbal biomass carbon increased as the elevation decreased.

Example 2

1 the soil depth of 0-10cm, increased from roughly 130 mgkg⁻¹ of microbial biomass carbon to roughly just over 350 mg Kg⁻¹ going from site A to site D. Meaning at site D which was the furthest down the slope had the most microbial biomass carbon in a soil depth of 0-10cm.

2. the soil depth of 31-60 cm doesn't contain any more than 100 mgKg⁻¹ of microbial biomass carbon from site A to site D.

site A has the least amount of microbial biomass carbon than any other sites. Site A was located on top of the slope.

(f) The loss of sediments from the Loess Plateau into the nearby Yellow River has been reduced by introducing terraces for crop production.

terrace

cherry-hai / Shutterstock.com

Explain a benefit to local farmers of using terraces for crop production.

2

Example 1

It holds more nutrients in the soil.

It allows for more cultivation space leading to a higher yield.

It makes it easier to farm on.

Less soil erosion occurs.

It holds on to moisture better.

Example 2

· if it rains the ~~plant~~ crops or seeds won't get washed down ~~any~~ the slopes and the terraces will gather the rain. meaning ~~less~~ they don't need to irrigate them as often.

· easier to plant the crops as not on a slope,

MARKS

DO NOT
WRITE IN
THIS
MARGIN

Questions 8 and 9 each contain a choice

For each question, attempt either A or B. Write your answers to questions 8 and 9 on the following pages. You may use diagrams where appropriate.

8.   A   In some soil profiles, distinct horizons are evidence of the translocation of some materials.

Discuss the translocation of materials through a podzol soil under the following headings.

(a) Leaching

(b) Eluviation

(c) Illuviation

10

OR

B   The global energy budget is the balance between incoming and outgoing solar radiation.

Discuss the impact of the following on the global energy budget.

(a) Insolation

(b) Albedo

10

9.   A   It is rarely possible to capture or count all the individuals in a population. Therefore the size and/or distribution of a population must be estimated.

Discuss biotic or biodiversity indices that could be used to estimate the population size and/or distribution of species.

10

OR

B   Biotic interactions can act as density-dependent controls, limiting the effects of high populations on ecosystem stability.

Discuss the effects of named biotic interactions on ecosystem stability.

10

8   A   Example

8. A. leaching

Leaching in soil profiles is when minerals are transferred through soils by water as it pulls eroded minerals down through the gaps and pockets of air in the soil, metaly minerals in podzol soils tend to be things like iron and that give it a red colour.

Eluviation

Eluviation is the removing of materials from the soil, this process can happen through erosion of the soil profiles by weathering or from rivers or water stores. Or from human interaction.

Illuviation

Illuviation is the transfer of materials into soil, this can happen through the break down of organic matter by detritivores, or the weathering of rock.

8   B   Example 1

Insolation is the amount of the suns energy that reaches the earths surface. More insolation reaches the earths equator, as this has the biggest surface area towards the sun and is closest to the sun. The suns energy also has less atmosphere to travel through to get to the equator rather than the poles. The tri - cellular model (hadley, ferrel and polar cells) help readistrubute the suns energy from areas of surplus to areas of defecit. The albedo effect is the amount of the suns insolation that is reflected back up into the atmosphere. It has a scale of 0-1. lighter colours reflect more of the suns energy and ~~better~~ ~~~~ darker colours absorb energy more. The poles for example reflect more energy back into the atmosphere. where as oceans and rainforests reflect less and hold more heat.

Example 2

a) insolation

when the ~~heat~~ light from the sun, comes into the earth's atmosphere, some of it is reflected back out into space where as some is absorbed by the earth. Which increases the global energy budget, causing the earth to heat up more, which speeds up climate change. There is an ~~out~~ output of ~~light~~ energy when it is ~~re~~ reflected by the earth and an input of energy when it is absorbed by the earth. The heat gets trapped in the earth atmosphere ~~causing~~ resulting in insolation.

b) albedo

white surfaces reflect the light more than black surfaces due to the black surface absorbing all the heat causing the atmosphere to be ~~a~~ warmer. White surfaces like snow and ice are important in reflecting light but due to ~~chemistry~~ climate change there is less snow and ice for the light to be reflected, and roads, and buildings ~~and~~ are increasing which increase the amount of heat being absorbed by the earth which ~~increasing~~ increases the earths temperature.

9   A   Example 1

Indices help us to understand how many species or what species are present. The trent biotic index is a measure of water quality. It is graded on 1-4 1 being non-polluted and 4 being polluted. It gives us an idea of what kind of species would be present in that particular area. Another method to work out the density of species is to use standard deviation. Another method to use for slow moving species is to place a grid quadrant over them. An example of this could be snails, however it is generally used for plant species. Using a random co-ordinate generator count up the number of species in that quadrant, then repeat the process and calculate the mean amount. A point method can also be used, this is where 10 rods are slowly suspended down and you count the amount

(continued overleaf)

of species that come into
contact with the rods before
they reach the ground. A way
of ~~counting~~ calculating numbers
of fast moving / mobile species
is to count the number of
feaces present in ~~a~~ given
area, this gives an idea of
the population of a species or
whether they are simply present
in an area or not. If a
species is too small to count
every individual then another
way to measure the amount
is to weigh them and use
a biomass reading. e.g. a
handful of woodlouse could
be 2.5g. A paired statement
key allows you to determine
what species are present
by giving you detail about
an individual species. e.g.

Species 1 <u>red wings</u>
Species 2 <u>bushy tail</u>
Species 3 <u>blue wings</u>
Species 4 <u>long whiskers</u>

Example 2

Capture mark recapture is a method of measuring the population size of a moving species. A certain number of species are caught and then marked with things like tracking chips or tags, then the animals are released and left for a short period of time before more of the population is caught and an equation is used to estimate the size of the population judging on how many animals had been previously caught and how many hadn't

Trent biodiversity Index

The trent biodiversity Index is used to measure water qualities of certain areas, this can help to show how bad the pollution the pollution is effecting the river and how severe the pollution levels are. This can be measured by taking samples of Indicator species Kick sampling can be used to do this where the river bed is disturbed upstream from a net and the species caught are Identified using pained statement keys. Species like Stone fly nymphs can show that the water is fairly clean as this species can't tolerate polluted water

Where as blood worms can help to show that the water is more polluted as this species can tolerate polluted water. The body of water can be given a score 0 being the most polluted.

Simpsons biodiversity Index

9   B   Example

B.

density-dependent factors are factors that effects certain densities of populations.

• diseases effects populational size due to it the killing of the weakest individuals, so only the fittest survives. Diseases help to stop the population from getting to big and only allow the fittest ~ to reproduce and pass on their genes. Which helps stabalise the ecosystem from overpopulation of certain ~~population~~ organisms.

• predators helps ~~so~~ prevent populations from increasing by killing off weak individuals and helping to control the population. Which stabalise, the ecosystem by preventing a population ~~to~~ from increasing to much that it starts to effect other animals / plants, ~~and~~ water supplies and the amount of habitats available.

• if prey numbers decrease so does the number of predators so prevents overpopulation so only the fittest individuals will be able to catch and eat and survive. So if a prey population decreases then it has an knock on effect on other of organisms that depend on that population so it is unstabilise the ecosystem.

• ~~if the water supply decreases so does the population~~

                    that
• the effect ~~on~~ these factors have on the population helps prevent overpopulation which stabalises the ecosystem and other organisms that depend on that population for survival.