

# **20. Human influences on ecosystems**

**20.1 Food supply**

**Paper 3 and 4**

Marking Scheme

## Q1.

(a)	150(%) ;;	2	MP1 300–120 or 180 MP2 correct calculation
(b)	<p><i>any three from:</i></p> <p>ref. to pollution / greenhouse gas emissions ; waste disposal / sewage / slurry / eutrophication (described) / AW ; animal welfare concerns / AW ; increased use / overuse, of antibiotics ; increased risk of disease / disease spreads more quickly ; AVP ;</p>	3	

## Q2.

(a)	<p><i>total of four from:</i></p> <p>(both) increase yield ;</p> <p><i>herbicides:</i> kills, weeds / unwanted plants ; reduce competition with weeds / AW ;</p> <p><i>chemical fertilisers (max three from):</i> increases growth of plants ; adds mineral (ions) / prevents deficiency diseases ; nitrates required for making amino acids ; magnesium ions for chlorophyll ;</p>	4	
(b)	<p><i>any three from:</i></p> <p>animal welfare considerations / AW ; increased risk of disease ; increased risk of antibiotic resistance ; (increased )(named) greenhouse gases ; ref. to pollution ; <i>idea of</i> habitat destruction to create space for livestock ;</p>	3	

## Q3.

(b)	<p><i>any two from:</i></p> <p>more economical ; uses less space (described) ; more food produced (than extensive farming) ; <i>idea of</i> being efficient ; easier to, monitor / manage / administer medicine ; protect from predators ; AVP ;</p>	2	
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## Q4.

(a)	agricultural machinery ; fertiliser ; insecticide ; herbicide ;	4	
(b)	<i>any three from :</i> production of (named) greenhouse gases ; spread of, disease / parasites ; ref. to animal welfare ; ref. to pollution ; use of antibiotics / ref. to antibiotic resistance ; AVP ;	3	

## Q5.

(a)	<i>any three from:</i> creates (named) pollution ; increases the risk of spread of, pathogens / disease ; increased use of antibiotics / ref. to antibiotic resistance ; disturbance to, (natural) food chains / webs ; loss of habitat ; livestock producing (named) greenhouse gases ; <b>AVP</b> ;; animal welfare issues / fish escaping and breeding with wild fish	3	
(b)	(a sustainable resource) is produced as rapidly as it is removed (from the environment) ; so that it does not run out ;	2	
(c)	fish stocks AND forests circled ;	1	

## Q6.

(a)	monoculture ; fertilisers ; herbicides ; insecticides ; pollinate ;	5	
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## Q7.

(a)	lack of biodiversity / fewer (wild) species / AW ; extinction of species ; loss of, habitats / resources (for species) / deforestation ; (crop) disease easily spread ; (crops) more susceptible to pests ; depletes soil nutrients ; <i>ref. to pollution</i> ; e.g. herbicides / pesticides / fungicides / fertilisers AVP ;; e.g. flooding / droughts	3	
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## Q8.

(a)	<pre> graph LR     AM[agricultural machinery] --&gt; AL[able to use larger areas of land]     CF[chemical fertiliser] --&gt; IDF[improve desired feature in crop / livestock]     CF --&gt; PN[provides nutrients to increase yield]     H[herbicide] --&gt; KAP[kills animal pests that damage crops]     H --&gt; RCW[reduce competition with weeds]     I[insecticide] --&gt; KAP     I --&gt; PN     SB[selective breeding] --&gt; IDF     SB --&gt; RCW   </pre>	4	5 correct = 4 marks 3 or 4 correct = 3 marks 2 correct = 2 marks 1 correct = 1 mark
(b)	loss of biodiversity ; reduction in genetic variation ; production of, (named) greenhouse gases / global warming ; water pollution / AW ; habitat destruction ;	2	

## Q9.

(e)	<p>named technology ;;  description of how it is used ;;</p> <p>e.g. <i>fertiliser</i>: increase productivity / increase yield / addition of (named) nutrients to the soil / nutrients to the plant / increase soil fertility</p> <p><i>herbicide</i>: kills or remove or prevents, unwanted plants or weeds / reduces competition (with weeds) / increases yield</p> <p><i>insecticide</i>: kills or remove or prevents, insects / pests (feeding on the crop ) / increases yield;</p> <p><i>agricultural machinery/techniques</i>:  irrigation / hydroponics / monoculture / greenhouse / polytunnel / less manpower / easier harvesting</p> <p><i>selective breeding or artificial selection</i>; desirable features e.g. more grains in wheat / disease resistance / small fruit trees / drought resistant</p> <p><i>GMO</i>: named examples – frost or pest resistant / golden rice / soya beans / flavr savr tomatoes</p>	3	
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**Q10.**

(a)	habitat loss / deforestation ; loss of biodiversity / extinction (of species) ; death of (wild) organisms / disruption of food web ; enhanced greenhouse effect / global warming ; more, carbon dioxide / methane ; pollution from urine / faeces ; pollution from farm machinery ; disease spreads (to wild populations) ; ref. to antibiotic resistance / inappropriate use of antibiotics ; AVP ;;	4	
(b)	<b>fertiliser:</b> increase productivity / increase yield / addition of (named) nutrients to the soil / nutrients to the plant / increase soil fertility ;  <b>herbicide:</b> kills or remove or prevents , unwanted plants or weeds / reduces competition (with weeds) / increases yield ;  <b>insecticide:</b> kills or remove or prevents, insects / pests (feeding on the crop / animals) / increases yield ;	3	

**Q11.**

(a)	<i>any three from:</i> loss of biodiversity / AW ; habitat destruction ; damage to, food chains / food webs ; soil erosion ; by, water / wind ; infertility of soil ; competition for resources ; ref to pollution ; AVP ; e.g. desertification / flooding / diseases or pests spreading to wild-varieties / migration (of species)	3	
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**Q12.**

(a)	to increase crop, yield / production ; to reduce competition with weeds ; AVP ;	2
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**Q13.**

(c)(i)	1 effect of waste (faeces and urine) on, waterways / crops ; 2 disease spreading to, wild populations / humans ; 3 use of antibiotics and (spread of) antibiotic resistance ; 4 use of pesticides ; 5 loss of <u>biodiversity</u> ; 6 release of, (named) greenhouse gases / carbon emissions ; 7 named consequence ; e.g. climate change / global warming 8 providing food for livestock requires monocultures ; 9 deforestation / habitat loss ; 10 <i>idea that</i> livestock production is an inefficient use of, crop plants / energy ; 11 AVP ; e.g. use of hormones and effect on wild populations / feminisation of fish	3	
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**Q14.**

(c)	<p>reduced / no, damage to crops ; <b>ora</b> increased, yield / quality (of the crop) ; <b>ora</b> more, income / profit ; <b>ora</b> because more, sugar / amino acids, available for growth ; <b>ora</b> reduced disease transmission / AW ; <b>ora</b></p>	2	<b>A</b> not / less, eaten by pests
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