

# Human Influences on Ecosystems

## Mark Scheme 1

<b>Level</b>	IGCSE
<b>Subject</b>	Biology
<b>Exam Board</b>	CIE
<b>Topic</b>	Human Influences on Ecosystems
<b>Paper Type</b>	(Extended) Theory Paper
<b>Booklet</b>	Mark Scheme 1

**Time Allowed:** 58 minutes

**Score:** /48

**Percentage:** /100

<p>1 (a) (i)</p>	<p>vertical axis – numbers / population ; horizontal axis – time / years ; curve showing exponential increase / log phase ;</p>	<p>[3]</p>	<p>I lag phase / curve starting at origin</p>
	<p>(ii) <i>idea that</i> 'birth' / reproduction / breeding, rate is greater than death rate ; no limiting factors ; no / little, competition ; plenty, of food / nutrients / space / mates / oxygen / resources ; no / few, predators ; no / few, parasites / pathogens / disease ; AVP ; e.g. no / little, pollution / waste products / toxins</p>	<p>[max 4]</p>	<p>I definitions of exponential growth</p>
<p>(b)</p>	<p><i>between 1950 and 2012</i> mass of fish caught increased and levels off ; 17 to 90 million tonnes / increase = 73 million tonnes ;  fluctuations / increases and decreases / described ; e.g. around 1970 / any time after 1990 ;  maximum catch, 94 million tonnes / in 1996 ; steep increase between, 1950–1970 / 1973–1989 ;</p>	<p>[max 3]</p>	<p><i>units must be used at least once</i>  <b>A</b> 16 to 18 / increase of 72 to 74  mp4 cannot be awarded without mp3</p>

Question		Mark	Guidance
1 (c)	<p><i>answers can refer to seas, lakes and/or rivers</i></p> <p>international, agreements/treaties ;</p> <p>quotas / permits / licenses ;</p> <p>fines/sanctions, for, overfishing / illegal / unauthorised, fishing ; fishery protection vessels / wardens / patrols / AW ;</p> <p>restrictions on times when fishing can occur ;</p> <p>exclusion zones / nursery zones / 'no take' zones / reserves ;</p> <p>total ban for some species ;</p> <p>regulations on method of fishing ; e.g. mesh size of nets / ban nets / use of lines instead / size of fishing vessel / 'fishing effort'</p> <p>education / raise awareness / any example ;</p> <p>monitoring fish stocks ;</p> <p>captive breeding (of wild fish) ; re-stocking (of wild stocks) ;</p> <p>encourage farmed fish ; e.g. provide subsidies</p> <p>AVP ; e.g. tax on wild fish / increase the cost of wild fish</p>	[max 6]	<p><b>A</b> set maximum mass / number / amount / quantity</p> <p><b>A</b> 'ban unauthorised fishing'</p> <p><b>A</b> consequences other than fines</p> <p><b>A</b> not in breeding season</p> <p><b>A</b> descriptions or examples</p> <p><b>A</b> named examples</p> <p><b>I</b> ban on all wild fish</p>

Question		Mark	Guidance
1 (d)	<p><i>definition of sustainable resource</i></p> <p>renewable / self-renewing / regenerates / described ; e.g. produced as rapidly as it is removed</p> <p>resource, does not / will not, run out / become exhausted ;</p> <p>replanting / reseedling / regrowing ;</p> <p>AVP ; e.g. pollarding / coppicing / leaving mature trees</p>	[max 3]	I reused / recycled
		<b>[Total: 19]</b>	

Question		Mark	Guidance
2 (a)	timber / paper, manufacture / AW ; firewood ;  <i>clearance for</i> agriculture ; urbanisation / roads / housing / factories / industry / leisure developments ; extraction of minerals / for other natural resources ;	[max 3]	A wood unqualified A fuel
(b) (i)	$118\,545 - 90\,883 = 27\,662$ $\frac{27\,662}{118\,545} \times 100$ ;  23.3(3459) ; 23 (%) ;	[3]	
(ii)	Indonesia has lost the most forest <b>ora</b> ; 9% (8.7%) compared with 23% in Indonesia ;  Indonesian forest has continued to be lost, whereas loss in Malaysia has slowed between 2005 and 2010 ; comparative use of figures with units ;	[max 3]	A14% more in Indonesia ecf from <b>(b)(i)</b>
(iii)	planted forest, has one (dominant) species / is a monoculture ; loss of <u>biodiversity</u> ; qualification of biodiversity loss ;  (plantation) susceptible to pest / disease ; nutrients removed / soils become infertile ; ref to alien / foreign / invasive / non-indigenous species ; AVP ; e.g. vegetation is removed / lower canopy / all immature	[max 3]	e.g. habitats / example / extinction of a species I homes / organisms die  A use of chemicals

Question		Mark	Guidance
2 (c)	<p> <u>roots</u> die so do not bind the soil ;                      loss of soil / soil erosion ;                      silting of rivers ;                      reduced (soil) fertility ;                      no trees to absorb the water ;                      increased risk of flooding ;                      increased rate of evaporation / land is exposed to drying ;                      desertification / decreased soil water ;                      loss of, habitat / places where organisms live / described ;                      disruption to food chain / described ;                      endangered / extinction, of species or loss of biodiversity ;                      AVP ; named example of affected 'land' organism in context / removed                      trees cause nutrient cycling disruption / lack of decomposition                 </p>	<p>[max 6]</p>	<p> <b>A</b> landslides   <b>A</b> loss of, minerals / ions / nutrients   <b>A</b> mudslides  <b>A</b> drought / decreased rainfall   <b>I</b> home   <b>I</b> organisms die                 </p>
		<p><b>[Total: 18]</b></p>	

Question	Expected Answers		Marks	Additional Guidance														
3 (a)	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 2px;"><i>Triticum aestivum</i></td> <td style="padding: 2px; text-align: center;"><b>D</b></td> </tr> <tr> <td style="padding: 2px;"><i>Solanum tuberosum</i></td> <td style="padding: 2px; text-align: center;"><b>G</b></td> </tr> <tr> <td style="padding: 2px;"><i>Glycine max</i></td> <td style="padding: 2px; text-align: center;"><b>C</b></td> </tr> <tr> <td style="padding: 2px;"><i>Manihot esculenta</i></td> <td style="padding: 2px; text-align: center;"><b>F</b></td> </tr> <tr> <td style="padding: 2px;"><i>Ipomoea batatas</i></td> <td style="padding: 2px; text-align: center;"><b>B</b></td> </tr> <tr> <td style="padding: 2px;"><i>Zea mays</i></td> <td style="padding: 2px; text-align: center;"><b>A</b></td> </tr> <tr> <td style="padding: 2px;"><i>Oryza sativa</i></td> <td style="padding: 2px; text-align: center;"><b>E</b></td> </tr> </table>		<i>Triticum aestivum</i>	<b>D</b>	<i>Solanum tuberosum</i>	<b>G</b>	<i>Glycine max</i>	<b>C</b>	<i>Manihot esculenta</i>	<b>F</b>	<i>Ipomoea batatas</i>	<b>B</b>	<i>Zea mays</i>	<b>A</b>	<i>Oryza sativa</i>	<b>E</b>	max [3]	5/6 right = 3 3/4 right = 2 1/2 right = 1 0 right = 0
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(b)	<p><i>general features:</i></p> <p><b>1</b> leaf, width / shape ;  <b>2</b> leaf connection to stem / AW ;  <b>3</b> number of (named) flower parts ;  <b>4</b> number of, cotyledons / seed  <b>5</b> leaves ;  <b>6</b> type of root ;  <b>7</b> pattern of vascular bundles ;  <b>8</b> presence/absence of cambium / AW ;</p>	<p><i>monocotyledon features:</i></p> <p>narrow leaves ;                      sheath / no petiole ;                      flower parts in multiples of 3 ;                      one cotyledon / seed leaf ;                      fibrous roots ;                      scattered vascular bundles ;                      no, cambium / woody tissue ;</p>	max [1]	<p><i>Mark answers in context of either general features (first column) or referring to monocotyledonous plants (second column)</i></p>														

Question	Expected Answers		Marks	Additional Guidance
(c) (i)	<ol style="list-style-type: none"> <li>1</li> <li>2</li> <li>3</li> <li>4</li> <li>5</li> <li>6</li> <li>7</li> </ol>	<p>increase in (soil) water /flooding /waterlogging ;  decrease in (soil) water /desertification ;  soil erosion ;  loss of, habitat /places where organisms live ;  disruption to food chain ;  endangered / extinction, of species or loss of biodiversity ;  AVP ; e.g. example of named soil organism in context of a function of a soil ecosystem</p>	<p>max [4]</p>	<p>A landslides /reduced soil volume loss of nutrients /reduced nutrient cycling</p>
(ii)	<ol style="list-style-type: none"> <li>1</li> <li>2</li> <li>3</li> <li>4</li> <li>5</li> <li>6</li> <li>7</li> <li>8</li> </ol>	<p>collecting / sorting (of paper) ;  shredding /AW ;  adding water to make, pulp /paste ;  cleaned / de-inked /AW ;  bleached ;  rinsed ;  pressed / rolled / flattened / dried, into sheets ;  any named product made from recycled paper ; e.g. low quality paper / toilet paper / newspaper</p>	<p>max [3]</p>	
			<p><b>[Total:11]</b></p>	