MEGA LECTURE

AQA (GCSE Notes)

Chapter 7: Ecology

Q1. What is meant by the term "ecosystem"?

Q2. Describe how abiotic and biotic factors interact in an ecosystem.

Q3. Give an example of how removing one species can affect an entire community.

Q4. What do plants compete for in their environment?

Q5. What do animals compete for in their habitat?

Q6. What is meant by the term “interdependence” in a community?

Q7. How does a stable community remain balanced over time?

Q8. Explain how the availability of food can affect an animal population.

Q9. Suggest how new predators can influence a community.

Q10. How might new pathogens impact a population in a community?

Q11. What happens if one species outcompetes another in a habitat?

Q12. Define the term “biotic factor.”

Q13. Define the term “abiotic factor.”

Q14. Give three examples of abiotic factors.

Q15. Explain how a change in light intensity might affect plant growth.

Q16. How can temperature changes affect animal populations?

Q17. Describe how low oxygen levels can affect aquatic animals.

Q18. Why is carbon dioxide important for plants?

Q19. Explain how soil pH can affect the type of plants in an area.

Q20. How can strong wind affect a plant community?

Q21. What is meant by the term “competition” in biology?

Q22. How do animals compete for mates and what is the effect of this?

Q23. Describe how seed dispersal is part of interdependence.

Q24. Why is pollination an example of interdependence?

Q25. How might moisture levels in the soil affect the plants growing there?

Q26. Suggest how organisms are adapted to live in dry conditions.

Q27. What could happen to a community if one species becomes extinct?

Q28. How does the presence of shelter affect animal survival?

Q29. What adaptations might help plants survive in low light conditions?

Q30. How can we describe the levels of organisation in an ecosystem?

Q31. What is meant by the term "individual organism"?

Q32. How do microorganisms play a role in the recycling of materials?

Q33. Why is photosynthesis important in ecosystems?

Q34. Explain how respiration links to the recycling of carbon.

Q35. Describe one way humans rely on ecosystem services.

Q36. How can humans act more sustainably toward ecosystems?

Q37. What does it mean when we say a species is “well adapted” to its environment?

Q38. Give an example of an adaptation in a desert animal.

Q39. How might cold temperatures affect plant life?

Q40. Explain the importance of mineral ions in the soil for plant health.

Q41. Suggest how a flood could impact the stability of a community.

Q42. How does seed dispersal by animals show interdependence between species?

Q43. Why is territory important for animal survival and reproduction?

Q44. What might happen if a new species is introduced into a stable community?

Q45. Suggest how disease could change the population sizes in a community.

Q46. Describe how animals in the same habitat may avoid direct competition.

Q47. Explain the role of decomposers in ecosystems.

Q48. How can a change in wind direction affect coastal plant communities?

Q49. Why is it important to monitor both abiotic and biotic factors in a habitat?

Q50. How can interpreting data from graphs and tables help us understand ecosystems?

Q51. What are structural adaptations and how do they help organisms survive?

Q52. Give an example of a behavioural adaptation and explain how it helps an organism.

Q53. What is a functional adaptation? Give one example.

Q54. How are camels adapted to survive in hot, dry conditions?

Q55. What are extremophiles and where can they be found?

Q56. Why are bacteria that live in deep sea vents called extremophiles?

Q57. Explain why polar bears have thick fur and a layer of fat.

Q58. How are desert plants adapted to reduce water loss?

Q59. What is the role of producers in a food chain?

Q60. Why do all food chains begin with a producer?

Q61. Describe the feeding relationship between producers and consumers.

Q62. What is the difference between primary, secondary, and tertiary consumers?

Q63. What do we mean by the term predator in a food chain?

Q64. What is meant by the term prey?

Q65. Describe what happens to predator and prey populations in a stable community.

Q66. How can food chains be used to show the flow of energy in an ecosystem?

Q67. How can the abundance of a species in a habitat be measured using a quadrat?

Q68. What is a transect and how is it used in ecology?

Q69. Describe how to use a quadrat to compare the number of plants in two areas.

Q70. Why is it important to use random sampling in ecological studies?

Q71. What are the terms mean, mode and median used for in data analysis?

Q72. How do you calculate the mean number of daisies in a sample of quadrats?

Q73. What does a food chain show about the feeding relationships in a habitat?

Q74. What are the advantages of using graphs to model predator-prey cycles?

Q75. How can changes in prey population affect the number of predators?

Q76. How does a fall in predator numbers affect prey populations?

Q77. Describe the pattern you would expect in a predator-prey cycle graph.

Q78. What is the role of decomposers in recycling materials?

Q79. Why is the carbon cycle important to living organisms?

Q80. Describe how carbon is returned to the atmosphere in the carbon cycle.

Q81. How is carbon removed from the atmosphere during the carbon cycle?

Q82. What is the role of photosynthesis in the carbon cycle?

Q83. How does respiration contribute to the carbon cycle?

Q84. Explain how microorganisms return mineral ions to the soil.

Q85. Describe how the water cycle moves water through the environment.

Q86. How is water evaporated and then returned to land?

Q87. Why is the water cycle important for plants and animals?

Q88. Explain how decay is involved in the cycling of materials.

Q89. What conditions speed up the rate of decay of biological material?

Q90. How does temperature affect the rate of decay?

Q91. Why does decay slow down in very dry conditions?

Q92. What role does oxygen play in the decay process?

Q93. How is compost made and why is it useful?

Q94. What is anaerobic decay and what gas does it produce?

Q95. How is methane from anaerobic decay used as a fuel?

Q96. What is a biogas generator and how does it work?

Q97. Why do farmers try to control conditions to speed up decay?

Q98. How can you calculate rate changes in decay from a graph?

Q99. Why is it important to provide optimum conditions for composting?

Q100. Describe how to plot a graph to show the effect of temperature on decay.

Q101. What effect does a change in temperature have on the distribution of species in an ecosystem?

Q102. How can availability of water influence where certain organisms live?

Q103. Describe how a change in atmospheric gases might affect an ecosystem.

Q104. Give an example of how seasonal changes can impact the distribution of organisms.

Q105. How can geographic changes affect local biodiversity?

Q106. Describe how human activities can cause changes in species distribution.

Q107. What is meant by biodiversity?

Q108. Explain how high biodiversity contributes to the stability of ecosystems.

Q109. Why is maintaining biodiversity important for humans?

Q110. Name three human activities that are reducing biodiversity.

Q111. How does pollution in water affect biodiversity?

Q112. What are some sources of water pollution and their effects on aquatic life?

Q113. Describe how air pollution can reduce biodiversity.

Q114. What is the impact of land pollution on plants and animals?

Q115. How does the increase in human population lead to more waste?

Q116. Why is it important to manage waste properly?

Q117. How does landfill use affect land ecosystems?

Q118. What kinds of toxic chemicals can pollute ecosystems, and where do they come from?

Q119. What happens to ecosystems when sewage enters water sources?

Q120. How can fertilisers harm aquatic life?

Q121. Why does smoke from factories reduce air quality and harm species?

Q122. What are some effects of acidic gases on plant life?

Q123. Describe how human use of land can reduce habitats.

Q124. What are the main ways humans use land that affect other species?

Q125. How does farming reduce the amount of land available for wildlife?

Q126. What impact does quarrying have on local ecosystems?

Q127. How does building cities or roads reduce biodiversity?

Q128. Why are peat bogs important for biodiversity?

Q129. What is peat used for, and why is this a problem for the environment?

Q130. How does removing peat lead to carbon dioxide release?

Q131. Explain why the decay of peat is harmful to the atmosphere.

Q132. Why is there a conflict between using peat for compost and protecting habitats?

Q133. Suggest ways to reduce the impact of peat use on the environment.

Q134. What could be used as alternatives to peat in gardening?

Q135. How does deforestation affect the carbon cycle?

Q136. What are the environmental consequences of large-scale deforestation?

Q137. Why does deforestation reduce biodiversity in tropical areas?

Q138. How does deforestation lead to soil erosion?

Q139. What happens to local climate conditions when forests are removed?

Q140. Why are forests cleared to grow biofuel crops?

Q141. What are the effects of growing rice and cattle on deforested land?

Q142. How does rice farming in deforested areas contribute to greenhouse gas emissions?

Q143. What gas is released by cattle in large amounts, and how does this affect the environment?

Q144. How can deforestation affect rainfall patterns?

Q145. Why is it important to evaluate the long-term impacts of deforestation?

Q146. How can humans balance the need for resources with protecting ecosystems?

Q147. Suggest actions that individuals can take to reduce deforestation.

Q148. What role does sustainable farming play in protecting biodiversity?

Q149. Why is global cooperation needed to tackle the loss of biodiversity?

Q150. What are some international efforts in place to reduce the impact of deforestation?

Q151. What are the main greenhouse gases responsible for global warming?

Q152. How do carbon dioxide and methane contribute to global warming?

Q153. What are some biological effects of global warming on species distribution?

Q154. How can global warming affect migration patterns in animals?

Q155. Explain how rising temperatures can impact biodiversity.

Q156. Describe one way global warming could affect the timing of flowering in plants.

Q157. Why are polar ecosystems especially vulnerable to global warming?

Q158. How does the scientific community gather evidence about global warming?

Q159. Why is it important that scientific research on climate change is peer-reviewed?

Q160. What makes it difficult to fully predict the impacts of global warming?

Q161. Describe one example of positive human interaction that helps protect biodiversity.

Q162. What are breeding programmes and how do they help endangered species?

Q163. How does protecting rare habitats help maintain biodiversity?

Q164. Why is reintroducing field margins and hedgerows good for ecosystems?

Q165. What are the benefits of reducing deforestation for biodiversity?

Q166. How does recycling help reduce negative impacts on the environment?

Q167. Explain one way governments can reduce carbon dioxide emissions.

Q168. Give an example of a conflict that can arise when trying to protect biodiversity.

Q169. Why is it sometimes difficult to convince people to reduce their environmental impact?

Q170. How can local communities contribute to biodiversity protection?

Q171. What is meant by the term "trophic level"?

Q172. Which organisms are always found at trophic level 1 and why?

Q173. What types of organisms are found at trophic level 2?

Q174. Describe the organisms that make up trophic level 3.

Q175. What are apex predators and at which trophic level are they found?

Q176. Why do food chains usually have no more than four or five trophic levels?

Q177. Explain the role of decomposers in a food chain.

Q178. How do decomposers break down dead material?

Q179. What happens to the nutrients released by decomposers?

Q180. Describe how enzymes help microorganisms in decomposition.

Q181. Why are decomposers essential to the stability of ecosystems?

Q182. What is meant by a pyramid of biomass?

Q183. How is a pyramid of biomass different from a food chain diagram?

Q184. What does the width of each bar in a biomass pyramid represent?

Q185. Why is trophic level 1 placed at the bottom of the biomass pyramid?

Q186. Explain why there is less biomass at higher trophic levels.

Q187. What data is needed to construct a pyramid of biomass?

Q188. Describe how energy is lost at each trophic level.

Q189. What are some reasons why biomass is not fully passed on to the next level?

Q190. How could you calculate the efficiency of biomass transfer in a food chain?

Q191. Why do carnivores need to eat more than herbivores to get enough energy?

Q192. How does the loss of energy affect the length of food chains?

Q193. Why is measuring biomass more useful than just counting organisms?

Q194. Describe a method for collecting biomass data from a habitat.

Q195. What is one limitation of using biomass pyramids?

Q196. How might environmental changes affect the shape of a biomass pyramid?

Q197. What could happen to the biomass pyramid if a top predator goes extinct?

Q198. How would a decrease in producers affect the whole pyramid of biomass?

Q199. Why is it important to understand trophic levels when managing ecosystems?

Q200. Explain how human actions can disrupt trophic levels in a food web.

Q201. What is meant by the term “biomass” in a food chain?

Q202. Describe how biomass is transferred between trophic levels.

Q203. Why is only about 10% of biomass transferred to the next trophic level?

Q204. What happens to the rest of the biomass that is not transferred?

Q205. How is biomass lost through faeces?

Q206. Why does respiration cause a loss of biomass?

Q207. How is biomass lost in the form of water and urea?

Q208. Why is most of the light energy not used in photosynthesis?

Q209. What is meant by the efficiency of biomass transfer?

Q210. How do you calculate the efficiency of biomass transfer using mass values?

Q211. Why does the efficiency of biomass transfer affect the length of food chains?

Q212. How do losses in biomass affect the number of organisms at each trophic level?

Q213. Why do carnivores usually have smaller populations than herbivores?

Q214. Describe one reason why a food chain rarely has more than five trophic levels.

Q215. What percentage of the Sun's energy is transferred to producers?

Q216. How does energy use in movement contribute to loss of biomass?

Q217. Why is egestion necessary for animals but leads to biomass loss?

Q218. Give one way a pyramid of biomass shows loss of energy in a food chain.

Q219. What is meant by food security?

Q220. How can an increasing population affect food security?

Q221. Why do changing diets in developed countries threaten food security?

Q222. Give an example of how imported food can reduce food availability elsewhere.

Q223. How do pests affect food production in farming?

Q224. Describe how plant diseases can threaten food security.

Q225. Explain how environmental changes can lead to famine.

Q226. What is the effect of failed rainfall on crop production?

Q227. Why can conflicts in a country lead to food and water shortages?

Q228. How does the cost of farming inputs affect food supply?

Q229. Why is fertiliser important in crop farming?

Q230. How can the use of machinery in farming improve food production?

Q231. What is meant by sustainable food production?

Q232. Why must we find sustainable ways to feed the growing population?

Q233. Give one method farmers can use to increase yield sustainably.

Q234. How does transporting food long distances affect global food security?

Q235. Why is it important to protect soil quality for food production?

Q236. Explain how overfishing can reduce future food supplies.

Q237. What impact does climate change have on food production?

Q238. How can using local food sources help improve food security?

Q239. Why might some countries rely heavily on food imports?

Q240. How can biotechnology be used to help increase food supply?

Q241. What is the link between water availability and crop yield?

Q242. Why is education important in improving food security in developing countries?

Q243. What role do governments play in managing food security?

Q244. How might conflict between countries affect access to food?

Q245. What can individuals do to help reduce food waste and improve food security?

Q246. How does food waste in homes affect overall food security?

Q247. What effect do pests have on stored grain supplies?

Q248. Give one example of how a new disease in animals could affect human food supply.

Q249. How can modern technology help farmers respond to changing weather patterns?

Q250. Why is it important to evaluate food production data when planning food policies?

Q251. How does limiting animal movement help improve food production efficiency?

Q252. Why does controlling the temperature of animal surroundings reduce energy loss?

Q253. What is the purpose of feeding farm animals high-protein food?

Q254. How do intensive farming methods help meet food demands?

Q255. Give one reason why some people object to intensive farming practices.

Q256. What are the advantages of intensive farming for food supply?

Q257. What are the disadvantages of intensive farming for animal welfare?

Q258. Explain how ethical concerns can affect farming choices.

Q259. How does energy transfer in animals relate to farming efficiency?

Q260. Why might free-range farming be considered more ethical than intensive farming?

Q261. What does the term “fish stock” mean?

Q262. Why is it important to maintain fish stocks at a sustainable level?

Q263. How do fishing quotas help conserve fish populations?

Q264. What is the purpose of controlling the size of fishing nets?

Q265. How can overfishing lead to the collapse of fish species in an area?

Q266. What might happen to marine food chains if fish stocks fall too low?

Q267. Why is it important to allow fish time to breed?

Q268. How can smaller net sizes help protect young fish?

Q269. What role does government policy play in sustainable fisheries?

Q270. What are the challenges in enforcing sustainable fishing practices?

Q271. What is biotechnology?

Q272. How is the fungus Fusarium used to make mycoprotein?

Q273. Why is mycoprotein a useful food source for vegetarians?

Q274. Describe the conditions required to grow Fusarium for food.

Q275. How is the biomass from Fusarium processed before it can be eaten?

Q276. What is genetic modification?

Q277. How is a genetically modified bacterium used to produce human insulin?

Q278. Why is genetically engineered insulin important in medicine?

Q279. What are GM crops?

Q280. How can GM crops help increase food supply?

Q281. What is golden rice and how is it different from normal rice?

Q282. How can golden rice help reduce vitamin A deficiency?

Q283. What are some possible benefits of using GM crops in developing countries?

Q284. What concerns do some people have about the use of GM crops?

Q285. How can biotechnology help reduce pressure on land used for farming?

Q286. Describe one way that biotechnology can reduce the need for chemical fertilisers.

Q287. How can scientists use microorganisms to produce useful products?

Q288. Why must fermentation tanks for growing Fusarium have a supply of oxygen?

Q289. What are the advantages of using microorganisms in food production?

Q290. How does biotechnology contribute to sustainable food production?

Q291. What is meant by “aerobic conditions” in the growth of Fusarium?

Q292. Why is glucose syrup used when culturing Fusarium?

Q293. What steps are taken to purify mycoprotein before it is eaten?

Q294. How can biotechnology help reduce world hunger?

Q295. Give an example of how biotechnology is used to treat disease.

Q296. What factors need to be considered when introducing GM crops to a region?

Q297. Why do some farmers choose not to grow GM crops?

Q298. How might biotechnology help deal with crop pests in the future?

Q299. How can scientists test the safety of GM food?

Q300. What role do public opinions and media play in decisions about biotechnology?