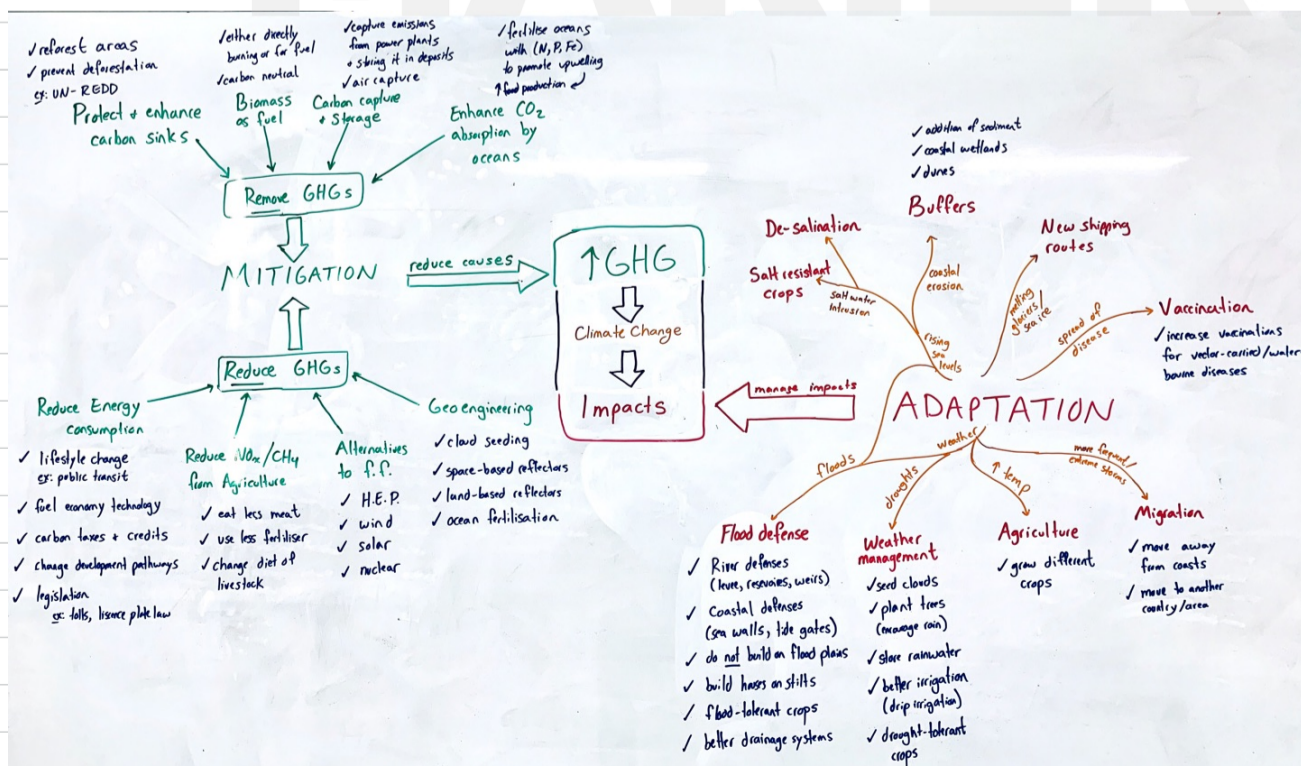


Markscheme

- 1) a) more habitats provides more niches (ecological role) and thus more opportunities for multiple types of species to co-exist. Limited habitat diversity would increase competition where only 1 or a few would thrive.
 b) resiliency is the ability of a system to return to its initial state following a disturbance.
 the more diverse/complex an ecosystem, the more resilient as there are more interactions between species.
 if a species goes extinct, greater likelihood that another species can replace them and take over niche.
 greater genetic diversity gives a population more chance of potential adaptive feature in the face of environmental change (new selection pressure)
- 2) Many possible answers. Ex: Protected areas can be established where development is forbidden. Development of cities/roads/etc. should first survey area to assess potential impacts and plans should strive to mitigate disturbance.
- 3) Advantages: more crops/area → increased crop yield, more efficient management, less competition from other plants
 Risks: possibility of entire crop being wiped out by disease or sudden change in environment (flooding, drought, new predator). Can also lead to nutrient depletion in soil, so more fertilizers are often required.
 → mitigation: mixed-approach where other crops planted alongside which can aid in nutrient cycling. More diversity in crops.
- 4) Fragments the habitat which can lead to declining populations and facilitate extinctions.
 - smaller habitats could be insufficient for larger species or those that require territory or space to hunt
 - isolated patches reduce the potential of species dispersal.
 - edge effects more common where there is an increase in disturbance and predation
 - reduced ability to migrate
 - increased chance of human disturbance (ex: poaching, car collision, etc.)
- 5) Trees are first cut down "slash". Then the remaining biomass is left to dry and then burned to produce ash.
 Problems: nutrients typically depleted after a few years, leading to site being abandoned.
 makes area prone to soil erosion and accompanying landslides and floods of downstream water bodies
 loss of forest increases CO₂ and less photosynthesis and combustion further increases CO₂ → contributing to enhanced greenhouse effect
- 6) Many possible answers. At individual level: reduce water use outside, pick up litter and pet waste, dispose of hazardous chemicals properly and not directly in drain
 At city level: barriers and filters leading into/out of drains, waste pickup and proper disposal/recycle
- 7) Plastics can take hundreds of years to breakdown. Most of it is not recycled and used only once leading to an exponential build-up overtime
 Solutions: Plastics can be recycled to make other products (roads, clothes, shoes, furniture, etc.).
 Ocean filters and cleanup programmes
 Bacteria that can breakdown PET plastic. Could be used in landfills and recycling plants.
- 8) Humans have placed themselves at the top of food chains, thus highest level consumer (even above quaternary), leading to higher levels of pollutants.
 Humans are also long-lived, making bioaccumulation possible in tissues like fat.
- 9) Mitigation: intervention to reduce anthropogenic climate change causes (reduce GHG emissions and increase GHG sinks)
 Adaptation: adjustment in systems to manage and lessen impacts of climate change



Markscheme

10 Many possible examples. Destruction of habitats, introduced species more common → Reduction of apex predator → top-down impact
→ reduction of producers → bottom-up impact

11 Many possible examples.

↪ hunting: tigers, cheetahs, rhinos, pangolin, elephants, bonobos, giant pandas, gorillas, sea turtles, monk seals,

overfishing: sharks, bluefin tuna, atlantic cod, halibut, sturgeon, red snapper, salmon, sea scallops

invasive species: cane toad, emerald ash borer, zebra mussel, asian carp, water hyacinth, asian long-horned beetle, kudzu, european starling, sea lamprey