🌎 <u>Essay Notes (O Level Elective Geography)</u>🌱

With examples, of course!

- Click the topic links below to open each respective chapter that can be tested for essay
- This set of notes can be used to study for **BOTH** the essay and normal questions (note that some superfluous details are omitted)
- Currently examples with '?' imply insufficient statistics in the textbook

Testable Climate Topics:

- <u>1.2 Variations in Air Temperature</u>
- <u>2.1 Natural Variability of Climate</u>
- <u>2.2 Anthropogenic Factors Contributing to Climate Change</u>
- 2.3 Impact of Climate Change on Natural Systems
- 2.4 Impact of Climate Change on Human Systems
- <u>3.2 Variations of Climate Risks across Places</u>
- <u>3.3 Effectiveness of Mitigation Strategies in Building Community Resilience to Climate</u>
 <u>Change</u>
- <u>3.4 Effectiveness of Adaptation Strategies in Building Community Resilience to Climate</u> Change

Testable Tourism Topics:

- <u>1.2 Reasons that Led to the Growth of Tourism</u>
- <u>2.1 Trends in Tourism</u>
- <u>2.2 Economic Impacts of Tourism</u>
- <u>2.3 Social Impacts of Tourism</u>
- 2.4 Environment Impacts of Tourism
- <u>3.2 Effectiveness of Stakeholders in Influencing Sustainable Tourism Development</u>
- <u>3.3 Effectiveness of Stakeholders in Influencing Sustainable Tourism Development</u>

Essay Format Recap:

- 1. Intro
 - a. Scope: "While strategies like (factor 1) are effective, (factor 2) is also effective/another factor that..."
- 2. Body x2
 - a. Factor
 - b. Explanation (4 bullet points)
 - c. Example (2 bullet points, **must** have location/statistic)
 - d. Link factor to common criteria in qn (e.g. effectiveness)
- 3. Conclusion
 - a. Stand

(CC0) No Rights Reserved. Feel free to distribute.

- b. State weighing criteria (Scale, long/short term, cause&effect, interdependent, cost-effective, solution)
- c. Reasons (1 for main factor 1 for alternate factor, use logic, build on 'why')

1. Climate

1.2 Variations in Air Temperature

| Factor | Explanation (~4 points) | Example (~2 points) | |
|---|---|--|--|
| Most likely factors b | Most likely factors based on geographical location, not based on time, will be tested for essay (can use scale) | | |
| Air temperature varies due to differences in <u>latitude</u> | temperatures lower at higher latitudes due to Earth's spherical shape → angle at which sun rays strike Earth's surface (solar angle) varies @ different parts higher latitude → smaller solar angle → less direct solar radiation → spread over a large area → less concentrated → ↓ temp | Beijing, Cina (40°N) temperatures around 12°C Singapore (1°N) temperatures around 29°C | |
| Air temperature varies due to differences in <u>altitude</u> | @ local scale → temperatures lower at higher altitude @ higher attitude → air less dense because air pressure is lower as gravity pull air molecules down fewer air molecules → air has lower ability to absorb and radiate heat → lower temperatures | Average Temp Genting Highlands (1700m above sea level) 12°C Surrounding areas at sea level is about 32°C | |

| Air temperature at specific sites are influenced by <u>type of surface</u> | dark surfaces → absorb more solar radiation → radiate more heat → ↑ temp light coloured surfaces → reflect more solar radiation → radiate less heat → ↓ temp urban areas have higher temp large areas of dark surfaces (roads) glass-covered skyscrapers (reflect sunlight to ground surface) | Night Time at Singapore's Central Business District is 2°C warmer than area near Macritchie Reservoir (with very dense vegetation) |
|---|---|---|
| Air temperature at specific sites are influenced by <u>distance from sea</u> | Coastal area → maritime effect (cooler summer, warmer winter) → lower ATR Inland Areas → continental effect (warmer summer, cooler winter) → higher ATR sea heats up and cools down slower than land during winter → sea is warmer than land → warming air along coastal areas during summer → sea cooler than land → cools air along coastal areas inland areas do X experience moderating influence of sea | Anchorage, Alaska, USA (coastal city) → lower ATR of 23°C Fairbanks, Alaska, USA (inland city) → higher ATR of 40°C |

2.1 Natural Variability of Climate

Not included: how Earth's climate changed over geological time, how Earth's climate zones changed

| Factor | Explanation (4 points only) | Example (2 points only) |
|--------------------------------------|---|---|
| Climate variability occurs due to | Orbit • Earth's orbit stretched from circular to elliptical shape and back again | (given explanation is sufficient, according to Mr Chan) |

| <u>changes in Earth's</u> orbit & angle of tilt | Every 100k years When most elliptic → Earth will travel in a more oval shape → more radiation reaches Earth at closest approach and less at farthest departure Earth's axis varies back and forth between 21.5° and 24.5° Every 41k years When tilt ↓ → the hemispheres lean further away → warmer winters & cooler summers Allows building of large ice sheets in higher latitudes → cooling Earth | |
|--|--|--|
| Climate variability occurs due to <u>occurrences of</u> <u>sunspots</u> | Higher sunspot activity → higher amounts of solar radiation Sunspot has ↓ temp → areas surrounding it radiate more energy → ↑ solar radiation emitted → ↑ temperatures on Earths Periods of maximum sunspot activity correspond to periods of high annual surface temperatures | (given explanation is sufficient, according to Mr Chan) |
| Climate variability occurs due to <u>occurrences of</u> <u>large-scale</u> <u>volcanic eruptions</u> | Volcanic eruption → release large volumes of sulfur-based particles, dust & ash Spread around lower atmosphere Absorb & reflects solar energy back into space Temporarily offsets greenhouse effect → lower temperature (until particles grow large 7 fall) | • Eruption of Mount Pinatubo, 1991, dropped average global temperatures of about 0.6°C over 15 months after eruption |

2.2 Anthropogenic Factors Contributing to Climate Change

Questions: Would they test changing land use separately

| Factor | Explanation (4 points only) | Example (2 points only) |
|---|---|---|
| Preamble Greenhouse Effect: Natural process where some longwave radiation is absorbed by greenhouse gases and re-emitted in the atmosphere, keeping the Earth warm. Enhanced Greenhouse Effect: With ↑ anthropogenic activities → more greenhouse gases in atmosphere → more longwave radiation absorbed → more heat re-emitted & less heat escapes | | |
| <u>Burning Fossil</u> <u>Fuels</u> | Fossil fuels have high carbon content Burning of fossil fuels such as coal, oil and natural gas produces large amounts of CO2 and other GHGs → enhanced greenhouse effect Fossil fuels are burned to create energy for human activities | Since 1880s, use of fossil fuels increased steeply to more than 35 billion tonnes of CO2 emissions per year |
| Changing land use due to <u>Deforestation</u> | Fossil fuels are burnt for agriculture, industries and urbanisation → enhanced greenhouse effect Deforestation: large scale deforestation carried out for resources and land → ↑ CO2 levels as less trees can absorb CO2 via photosynthesis and clearing trees expose soil to sunlight, ↑ soil temp and rate of carbon oxidation | • Globally tropic deforestation contributes to 20% of annual greenhouse gas emissions |
| Changing land use due to <u>Agriculture</u> | Agriculture: As population grow → more space needed to meet rising demand for food Contributes to 30% of global GHG emissions due to burning of fossil fuels due to farm machinery | Globally decomposition is rapid in paddy rice fields due to the high amount of moisture in the soil → contributes to 5% to 20% of methane emissions |

| | livestock rearing and natural decomposition releases methane | |
|--|---|--|
| Changing land use due to <u>Industries</u> | • Industries: Fossil fuels burnt to generate energy to run machinery and factory processes | • Globally it is estimated that industries contribute to 43% of greenhouse gases annually |
| Changing land use due to <u>Urbanisation</u> | • Urbanisation: Fossil fuels burnt to power high concentration of vehicles and household activities | Globally cities consume about 78% of world's energy and contribute significantly to the emission of greenhouse gases |

2.3 Impact of Climate Change on Natural Systems

| Factor | Explanation (4 points only) | Example (2 points only) |
|---|--|--|
| Impact of Climate Change on Natural Systems due to Increase in Atmospheric and Ocean Surface Temperatures Changes to Ocean Circulations Changes in Precipitation on Land | ↑ Atmospheric & Ocean Surface Temperatures: Earth's temp has been increasing since Industrial Revolution Changes to Ocean Circulations: Global Ocean Circulation: warm surface water moves polewards due to wind → cools, denser & sinks → form cool subsurface flows → eventually rises back towards surface CC slows down global ocean circulation → water at surface gains | Temperature has steadily increased from -0.05°C to 0.55°C since 1964 to 1968 (industrial revolution) Ocean Current in the Atlantic Ocean slowed by about 15% The Poles, parts of Southeast Asia and Central Africa face excessive rainfall Southwest USA and parts of the Sahel region in Africa face more droughts |

| | heat → less dense → sinking of water reduced Changes to Precipitation on Land: wet regions expected to get wetter, dry regions drier warmer air → ↑ water vapour (because warmer air can hold more water vapour) → increased evaporation → increased excessive rainfall ↑ evaporation → ↓ surface water → dries vegetation → lack of moisture & occurrence of rain → droughts | |
|--|--|--|
| Impact of Climate Change on Aquatic Ecosystems <u>Threat to Coral</u> <u>Reefs</u> | Corals and algae have a symbiotic relationship → algae are the corals' primary food source and give them their colour ↑ ocean temperature causes algae in corals to leave W/o algae → lose major source of food → turn white → vulnerable to diseases → death | Great Barrier Reef in Australia severely affected in 2016-2017 due to rising sea temperature Up to 2 thirds of corals died in the northern section of reef |
| Impact of Climate Change on Aquatic Ecosystems <u>Ocean Acidification</u> | Oceans are natural carbon sinks due to phytoplanktons which absorb CO2 during photosynthesis ↑ CO2 emissions → oceans absorb excess CO2 Carbonic acids form in the water → oceans become acidic Carbonic acids dissolve calcium carbonate (needed for aquatic organisms like corals) Coral reefs erode faster than new corals can form | Since Industrial Revolutions (1800s), ocean acidity increased by 25% Great Barrier Reef average coral cover dropped to about 30% from 1960s partly due to ocean acidification |

| | Coral skeletons shrink → species dependent on corals for food/habitat negatively affected → can go extinct | |
|---|--|---|
| Impact of Climate Change on Aquatic Ecosystems <u>Disruption to</u> <u>Marine Food Webs</u> | Slowing Down of Global Ocean Circulation: Increase in Ocean Surface Temperatures: Changes in Geographic Distribution of Aquatic Species: Warming oceans → aquatic species move polewards where temperatures more favourable → equatorial regions ↓ in biodiversity → poleward regions ↑ in biodiversity Changes in Composition of Aquatic Ecosystems: too boring (continue) ^ this part can be used to show that there are BOTH benefits and disadvantages and hence isnt the *most* severe impact | Phytoplankton levels in North Atlantic dropped by 10% since 1800s Tropical species like parrotfish and rabbitfish migrated polewards → diversity in tropical waters decreased significantly within last 50 years |

2.4 Impact of Climate Change on Human Systems

| Factor | Explanation (4 points only) | Example (2 points only) | |
|--|--|--|--|
| Preamble | | | |
| Direct impact | <mark>ts</mark> and <mark>indirect impacts</mark> can be interconne | cted | |
| All indirect in | All indirect impacts are interconnected w/ each other | | |
| For essays, direct and indirect impacts are most likely compared as a category which requires only 4 points of elaboration and 2 points of example – so either pick 1 factor and expand or pick 2 factors and briefly explain both if X enough content | | | |
| Climate change affects human | CC leads to ↑ temp → excessive precipitation globally Warmer temperatures lead to more snowmelt → ↑ sea level → higher coastal flood risk | • 2020 Bangladesh (densely packed, low-lying country) experienced worst monsoon flooding | |

| systems directly through <u>Floods</u> | Impacts: Loss of human lives due to drowning Destruction of buildings by fast-moving floodwater Waterborne diseases like cholera more prevalent → flood water enters drinking water | 260 people died 1.3 billion homes destroyed Millions of dollars lost due to damage of agricultural crops |
|--|---|--|
| Climate change affects human systems directly through <u>Droughts</u> | When area/region experiences lack of precipitation for extended period of time → water shortage CC leads to ↑ atm temp → ↓ surface water → dries soil and vegetation Dry climates become drier → ↑ frequency of droughts Impacts: Shortage of clean water can lead to dehydration and death Lack of water → crop failure & die from hunger | 2018-2019 Afghanistan drought → more than 2 thirds of country affected → over 10 million people affected due to lack of food & many displaced |
| Climate change affects human systems directly through <u>Heat Waves</u> | Period of excessively hot weather that is abnormal → usually lasting several days → as high as over 40°C CC leads to ↑ temp → heatwaves more intense & frequent Impacts: heat stroke, difficulty breathing and death high temp → deplete soil moisture → widespread crop failures → food supply | 2003 Europe heatwave → ~70k died → heatwave lasted 2 weeks Harvest for agricultural crops like wheat was affected as many crops died → increased price of bread significantly → less affordable |
| Climate change affects human | Unplanned & uncontrolled fires that burn in natural areas CC leads to warmer and drier conditions → ↑ dead trees & vegetation → easier for | 2019-2020 Australia wildfires → widespread fires that spread throughout entire continent |

| systems directly through <u>Wildfires</u> | wildfires to start & harder to put out Impacts: Suffocation, injuries & burns Large amounts of CO2, CO & fine particulate matter released into air → air pollution → respiratory illnesses and deaths Destruction of property & economic losses | Air quality was hazardous → Sydney: air quality 11x greater than hazardous standard 34 people died and thousands of buildings were burnt down |
|---|---|--|
| Climate change leads affects human systems directly through <u>Tropical Cyclones</u> | Intense circular storms originating over warm tropical oceans Accompanied by storm surges, strong winds and heavy rainfall CC leads to warmer oceans → ↑ water vapour in atm → more intense cyclones Impacts: Loss of lives due to flooding, landslides and collapsed buildings Strong winds destroy buildings (economic losses) | 2020 Philippines Typhoon Goni → brought strong destructive winds and high rainfall Evacuation of ~1 million ppl \$36 million damage to crops Loss of lives & massive destruction of property |
| Climate change indirectly impact humans by affecting <u>Provisioning</u> <u>Ecosystem</u> <u>Services</u> | Impact on Fish Production: CC leads to warmer oceans → species cannot cope with changes and die AND distribution of aquatic species changes as they look for cooler water → affect fishermans CC leads to sea level rise → saltwater enters freshwater → threatens freshwater fisheries Impact on Crop Yields: CC leads to more severe/frequent extreme weather events → crops less likely to survive Impacts: | Tonle Sap Lake, Cambodia fishing is a main economic activity ↑ temperatures & unpredictable rainfall → ↓ sea level significantly → ↓ availability of fishes ↑ temperatures → surrounding forest burn easily during dry season → destroy fish habitats & availability 2020 Thailand Drought → severely |

| | Affect economic livelihoods and food security as fish supplies ↓ | affected Thailand as agricultural sector uses 70% of nation's water |
|---|---|---|
| Climate change indirectly impact humans by affecting <u>Regulating</u> <u>Ecosystem</u> <u>Services</u> | Increase in vector-borne diseases: CC leads to warmer temperatures → more conducive environments for vectors like mosquitoes to survive & breed Temp ↑ → mosquitoes able to move to high latitudes Impacts: Loss of lives & reduced economic productivity when people are sick & cannot work | Before 2018 mosquitoes non-existent in regions of Bhutan as too cold 2019 Bhutan suffered first national dengue epidemic → many parts reported dengue virus |
| Climate change indirectly impact humans by affecting <u>Cultural Ecosystem</u> <u>Services</u> | Melting of Arctic Ice: CC leads to melting of Arctic ice → changes everyday cultural practices of Arctic indigenous people → traditional practices like storing food in ice cellars under threat Impact on Crop Yields: CC leads to degradation of natural landscapes → affects tourism industry | Maldives → sea level rise threaten low-lying islands → relies on tourism heavily Corals which are a huge tourist attraction affected by coral bleaching due to warmer oceans |

3.2 Variations of Climate Risks across Places

| Factor | Explanation (4 points only) | Example (2 points only) |
|------------------------------------|--|----------------------------|
| Preamble | | |
| Severity is de | etermined by | |
| o Natu | re of Climate-Related Hazards: Short-term or Long-term | |
| • Vulne | erability: Physical, Social, Economic & Environmental factors that | |
| incre | rease susceptibility to hazards | |
| о Ехро | sure: Extent of exposure (how close they a | ire) |

| Climate risks are affected by <u>Nature of</u> <u>Climate-related</u> <u>Hazard</u> | Each hazard unique due to their intensity and duration Shorter-term events: form & last over a shorter duration of time (days/weeks) Immediate climate risk → quick & widespread destruction of property, loss of lives & disruption of services Longer-term events: form and last over a longer duration of time Communities have ample time to prepare & adapt to impacts of these hazards | 2021 Indonesia Tropical Cyclone Seroja → brought about torrential rains causing 59 deaths and displacing 563 from homes Since 2000, Western Region of USA multi-decade drought → 2 major reservoirs have shrunk & frequency of forest fires increase |
|---|--|---|
| Climate risks are affected by <u>Vulnerability</u> | Each hazard has different susceptibility due to specific conditions Poverty: extreme weather results in crop failures → ↓ supply of food → ↑ prices of food People in poverty cannot cope with ↑ prices → vulnerable to food shortages People in poverty cannot afford healthcare when infected b diseases caused by CC Lack of Access to Piped Water: extreme weather events can cause contamination of open water sources People in rural areas X connected to piped water rely on open water sources (like wells) → unable to access clean water when struck by extreme weather → forced to drink from these contaminated sources of water → spread of diseases (like cholera) | 2018-2019 Afghanistan drought → over 10 million people faced a severe food crisis due to widespread poverty 2015-2016 Dar Es Salaam, Tanzania floods → over 5k cases of cholera due to very limited access to piped water |

| Climate risks are affected by <u>Exposure</u> | Proximity to Coastal Environments: near the coasts more likely to be exposed to hazards like storm surges & sea level rise compared to inland communities Proximity to Dry Environments: near dry environments more likely to be exposed to droughts | Hawaii, US is more likely to exposed to potentially catastrophic coastal hazards like flooding whereas areas away from coastal areas have no exposure to sea level rise Central Asia and Australia with dry environments are expected to face severe droughts by the end of this century |
|---|---|---|
|---|---|---|

3.3 Effectiveness of Mitigation Strategies in Building Community Resilience to Climate Change

| Factor | Explanation (4 points only) | Example (2 points only) |
|---|---|--|
| Preamble Mitigation structure those that reaction Limited by terms [Memory Hack] You only need 4 buller point for limitation. | rategies <u>avoid contributing to climate chan</u> duce greenhouse gas emissions or enhand chnological, economic, social and instituti et points for explanation, so just pick 4! Mu | ge and are categorised into ce carbon sinks onal challenges st include at least 1 bullet |
| Greenhouse gas emissions can be reduced by <u>International</u> <u>Agreements and</u> <u>Cooperation</u> | Involves an international environmental treaty addressing climate change Greater responsibilities on developed countries (DCs) → DCs are the main source of past/current GHG emissions → expected to cut the most emissions Funds and technologies are directed to climate action developing countries (LDCs) → | 2015 Conference of Parties Paris Agreement → legally binding treaty adopted by 191 Parties in Paris, France → each party required to develop own set of targets & measures |

| | DCs provide financial support & share technology to adapt to CC Limitations: Dependent on parties' commitment to act as difference countries have different priorities Not legally binding → if party refuse, no legal action can be taken | |
|---|---|--|
| Greenhouse gas emissions can be reduced by <u>Use of Low-Carbon</u> <u>Technologies</u> | Technology released low levels of GHG Carbon Capture → capturing & separating CO2 from power plants and other industrial sources Utilisation and Storage → storing CO2 for long period of time to prevent escape into atm → like storing carbon in ocean and using CO2 as raw materials Limitations: Expensive & requires public funding for private research & development May leak out over time | Economic Limitation: 2020 SG Gov announced \$49 mil set aside to fund low-carbon energy research → to test effectiveness of Carbon Capture, Utilisation and Storage (CCUS) |
| Greenhouse gas emissions can be reduced by <u>Use of Clean</u> <u>Energy Sources</u> | From renewable sources that X emit GHG/pollute Solar Energy → Energy from sun converted into electrical energy → cleanest & most abundant Hydro-electric Power → Kinetic energy from moving water converted to electrical energy Geothermal → Energy from Earth's core heats up groundwater forming steam → kinetic energy converted to electrical energy | 2030 Singapore wants to increase solar capacity to meet 4% of SG's total electricity demand (can power about 350k households) |

| | Nuclear → Heat from splitting of radioactive atoms form steam → kinetic energy converted to electrical energy Limitations: Expensive & requires public funding to develop renewable energy technology & make it cost-competitive | |
|--|--|--|
| Greenhouse gas emissions can be reduced by <u>Changes in</u> <u>Consumption</u> <u>Patterns</u> | Household consumption of goods contribute to carbon footprint → try to reduce Food choices → shift to plant-based diets to reduce agricultural emissions & local produce to reduce transportation (↓ GHG) Food waste → buy only what's needed to reduce food entering landfill → releasing methane a GHG Use of plastics → refuse single-use plastics & opt for reusable plastic products → less GHG produced from manufacturing, incineration and biodegradation Fashion → sustainable materials or upcycle → ↓ demand → ↓ production → ↓ GHG produced Limitations: Long time to change people's mindset & consumption pattern Relies on commitment of companies to change resources → reluctant as reduce profits | Social Limitation: 2018 Singapore → >267 million bottled water consumed despite highly accessible drinkable tap water |

| Carbon sinks can be enhanced by <u>Protection of</u> <u>Oceans and</u> <u>Forests by</u> <u>Managing</u> <u>Land-use Change</u> | Reduce deforestation → encouraging certified sustainable wood & banning illegal deforestation Stops increase in conc. GHG & prevents soil erosion which can cover and suffocate aquatic organisms Restore Mangroves → plant mangrove seedlings along coasts & limit clearing of mangrove trees by locals Allow GHGs to be absorbed and stored in the soil & filter pollutants in rivers before harming aquatic organisms Limitations: Difficult to reduce deforestation in growing economies due to competing land use for industries, agriculture & urbanisation | Economic Limitations: 2020 Indonesia lost more than 100k hectares of forest cover Despite tightening regulations, still being cleared for palm oil, logging & mining |
|---|--|---|
| Carbon sinks can be enhanced by <u>Protection of</u> Forests through Forest Regeneration | When trees grow → absorb & store more CO2 Afforestation → planting trees in areas previously X trees Reforestation → re-planting trees in areas that previous have trees Limitations: Large-scale afforestation creates competition for land → limited land supply for agriculture lead to increased food prices → threaten food security Large-scale planting can take 50-100 years for its full effect of removing 200 billion tonnes of CO2 | Social Limitations: Afforestation is estimated to increase food prices by 80% by 2050 |

3.4 Effectiveness of Adaptation Strategies in Building Community Resilience to Climate Change

| Factor | Explanation (4 points only) | Example (2 points only) |
|--|--|--|
| Preamble Adaptation strategies lessen harms of climate change and are categorised into structural, technological, social, and institutional changes Limited by economic, technological, social and institutional challenges [Memory Hacks] You only need 4 bullet points for explanation, so just pick 4! Must include at least 1 bullet point for limitation. | | |
| Structural Adaptation Strategies | Construction of physical structures to manage water & floods Seawall → wall constructed along sea to protect property & people from coastal floods Water storage tanks → stores excess stormwater during excessive rainfall to prevent flooding in canals and drains Polder → low-lying land protected by dykes (barriers) and excess water pumped out → protect people & property Limitations: Costly to build structures strong enough to protect communities, especially for LDCs → must be enhanced regularly | East Coast Park, Singapore → seawalls protect coastline from sea level rise Stamford Detention Tank, Singapore → excess water flow into tank, stored temporarily → sensors detect drain water levels to manage flow |
| <u>Technological</u> <u>Adaptation</u> <u>Strategies</u> | Tech to produce food securely despite changing climate conditions. High-tech vegetable farms → remote monitoring to ensure optimal conditions & faster harvest | Singapore's "30 by 30" plan: Increase local food supply to account for 30% of resident's nutritional needs by 2030 \$40 million used to fund 9 high-tech |

| | High-tech egg farms → automated egg checks & reduce manpower required High-tech fish farm → automated water tanks to monitor quality and fish health → swiftly prevent spread of disease Limitations: Very costly to construct and fund research & development | farms using automation and AI to ↑ production |
|---|---|---|
| <u>Social Adaptation</u> <u>Strategies</u> | Raising awareness & educating communities on how to respond. Increases awareness of warning signs prior to climatic hazards → can take appropriate steps to protect themselves Limitations: People unwilling to change behaviour/mindset due to personal reasons | Nepal → communities taught to plant drought-resistant crops to cope with prolonged drought Some communities prefer to stick to traditional methods for convenience |
| Institutional Adaptation Strategies | National Policies → national associations collaborate to plan for climate action Regional Policies → countries work together to protect current and future environmental interests in region Limitations: Countries have competing national priorities like urgent development projects → no capacity to draw on national budget for adaptation projects | National: Ministry of Sustainability and the Environment creates a national framework and roadmap for climate resilience Regional: ASEAN Climate Outlook Forum allows countries to collaborate and develop climate outlooks for region → can make decisions to adapt to future/current risks |

2. Tourism

1.2 Reasons that Led to the Growth of Tourism

| Factor | Explanation (4 points only) | Example (2 points only) |
|---|--|--|
| [Memory Hacks] Remember MMA 1. Motivation ha 2. Mobility has 3. Ability has 2 | as 3 NEEDS (relaxation/ self-fulfilment/ dis EXPANSION, INTRODUCTION & INCREASE INCREASE, 2 DECREASE and INNOVATION | scover unique travel exp) E |
| Motivation to travel due to <u>Need for relaxation</u> | ↑ Pressures from hectic lifestyle and work → increased need to relieve stress Relax and rejuvenate Enjoy scenic views & escape urban environment Enjoy recreational activities to escape stress | 2019 Universal Studios Singapore → a theme park featuring rides, shows and attractions completely different from usual life → welcomed more than 18 million visitors |
| Motivation to travel due to | People see travelling as a way to achieve fullest potential Allows them to develop skill sets and gain knowledge | Annually Mecca, Saudi Arabia → 2 million Muslim travellers for pilgrimage → series |

| Need for personal growth & self-fulfilment | Pick up new skills like cooking local cuisines Fulfil spiritual needs | of rituals for spiritual growth |
|---|---|---|
| Motivation to travel due to <u>Need to discover</u> <u>unique travel</u> <u>experiences</u> | People see travelling as a way to satisfy curiosity & explore different unique environments & cultures Social media ↑ interest in such unique destinations Globalisation connected remote places to major cities → ↑ accessibility Unique places ↑ tourism numbers | Last 2 decades Antarctica → tourism numbers increased significantly → satisfy curiosity about world's last uninhabited regions |
| Ability to travel due to <u>Increase in</u> <u>disposable income</u> <u>(DI)</u> | After WW2 economic development ↑ → ↑ DI in North America (NA), Japan, Western Europe Rapidly developing countries experience a growing middle class with increased DI → increase tourism demand | From 1999 to 2019 China → GDP quadrupled and international tourism grew from 9 million to 154 million departures |
| Ability to travel due to Increase in leisure <u>time</u> | Refers to time away from work responsibilities Since 1950s, government & businesses have increased people's leisure time → through paid leave, public holidays & shorter working weeks → more time to travel Increased paid leave ↑ ability to finance travel | 2015 Chinese government → encouraged employers give workers half day of paid leave on Fridays during Summer months → boost domestic tourism |
| Ability to travel due to | Air transport more affordable → international tourism more affordable (heavily reliant on air transport) No. budget airlines ↑ → tickets significantly cheaper | AirAsia → budget airline → significantly lower prices → ↑ popularity |

| Decreased transport costs | • Fuel-efficient planes → reduce fuel costs | |
|--|--|---|
| Ability to travel due to <u>Decreased</u> <u>accommodation</u> <u>costs</u> | ↑ accommodation types (like rented properties, bed n breakfast stays) at different prices Wide variety caters to different budgets → lowering accommodation costs More affordable | 2019 AirBnB → connects people who want to rent out their homes to tourists → estimated 2 million people stayed in an Airbnb property daily → competitive prices which makes it cheap |
| Ability to travel due to <u>Business</u> <u>innovations</u> | ↑ innovations providing value-for-money experiences More affordable travel options Tour operators increasingly replaced by websites that provide more personalised and affordable travel experiences | Trivago has search engines for travellers to compare trip prices & reviews → book trips directly on website & get promotions |
| Mobility in travel due to Expansion of public transport <u>services &</u> infrastructure | ↑ construction of public transport infrastructure to increase connectivity within a country and across countries Network of public transport services expanded through ↑ public bus and train routes Decrease travel times and increase convenience in travelling → tourism growth | Changi airport's Terminal 4 → more flights from other parts of Asia to Singapore → decreasing wait time and increasing convenience |
| Mobility in travel due to <u>Introduction of</u> <u>new modes of</u> <u>travel</u> | Tourists can travel faster and further via land, sea and air Technological advancements enabled production of aircrafts that travel faster and further due to fuel efficiency ↓ travel costs, ↓ travel time, ↑ convenience | From Tokyo to Osaka → 1965 Conventional Train 6 hours and 40 minutes → Shinkansen Bullet Train 3 hours and 10 minute → increased tourism in cities served by the network |

| Mobility in travel due to | Private ownership allows families to travel comfortably, conveniently in their own vehicles for leisure More freedom in number of | Since 1950s private car ownership in US ↑ significantly → American families travelled around |
|--------------------------------------|--|--|
| Increase in private car ownership | destinations to visit & time spent at each destination Boost domestic tourism | country in cars → boosted domestic tourism, hotel and motel businesses |

2.1 Trends in Tourism

| Factor | Explanation (4 points only) | Example (2 points only) |
|--------------------------------|---|--|
| Trends due to Globalisation | Continued growth of international tourism: Due to increase in ability to travel (demand for travel increases → ↑ competition → ↑ affordability as prices decrease) Motivation to travel (online media increases awareness of new experiences and destinations) Mobility in travel (accessibility & convenience) Tourist generating & destination regions more diverse: Developing countries especially in Asia Pacific region (APAC) become increasingly popular Most tourists come from the most developed countries | (use any example from 1.2) China, Thailand and Malaysia are among world's most popular tourist destinations today |
| Trends due to | Increasing popularity of lesser known destinations not easily accessible: More people want to fulfil need to discover unique travel experiences | Antarctica → increased availability of cruise services → increase convenience and popularity as people seek to |

| Changing Demands for Tourism | Globalisation facilitated sharing of experiences online, enticing more people to seek novel travel experiences in remote destinations Advancements in travel technology and expansion of transport infrastructure makes it more accessible Emergency of new experiences: Adventure → want to achieve self-fulfilment by participating in challenging physical activities in natural environments → places with natural beauty and physical challenges Sports → (same as above + logic) Heritage → want to fulfil need for unique travel experiences by participating in activities to learn about cultural history → places with rich history & UNESCO World Heritage Site status Health → want to improve health cheaper, faster or quality healthcare unavailable in country → places with renowned medical services | discover last uninhabited regions Adventure: Mount Everest → trekking becoming more popular among adventure tourists who seek to challenge themselves Heritage: Machu Picchu, Peru → >1 million tourists yearly → attracted to learn more about unique history and culture |
|---|--|---|
| Trends due to <u>Changing Supply</u> <u>for Tourism</u> | Addition of Small Specialist Tour Operators to Mass Market Tour Operators: Supply niche travel vs tour packages for large groups of ppl Specific, less common destinations vfs popular tourist sites | Quark Expeditions → Arctic/Antarctic expeditions → from sea kayaking to iceberg cruising Klook → Singapore's largest mass-market tour operator offering variety of tours |

| Customisable as they cater to small groups of tourists vs uncustomisable Niche travel becoming more popular due to online media creating greater interest Tourism Marketing Changing from Traditional Print & Broadcast Media to Online Media: | worldwide & affordable • Klook → promotes tour packages on multiple social media platforms like Facebook and Instagram |
|--|---|
| Advances in technology shifting marketing from newspapers and television to social media | |

2.2 Economic Impacts of Tourism

| Factor | Explanation (4 points only) | Example (2 points only) |
|---|--|---|
| Preamble • \$\$ impacts o | f tourism affect destination regions more | |
| Positive economic impacts due to <u>Employment</u> <u>opportunities in</u> <u>formal & informal</u> <u>tourism sectors</u> | Tourism is labour intensive → creates large and wide range of employment opportunities in both tourist generating & destination regions Transport/accommodation/leis ure activities Formal employment → fixed work hours, stable wage, sign written contacts, contribute income tax Informal employment → irregular hours, fluctuating wage, no written contract, no income tax | 2015-2019 → 25% of all new jobs created by tourism 2019 → 330 million formal jobs worldwide from tourism |

| Positive economic impacts due to Income generation from tourists spending on goods and services | Benefit to locals → tourists spend money on G&S such as accommodation and food → increase income for locals Benefit to government → taxes can provide considerable revenues Benefit to country → tax invested in infrastructural improvement and subsidise education and healthcare → ↑ standard of living | 1980s Maldives → one of the world's poorest countries Now it has grown due to tourism opportunities due to its natural landscape → low poverty rates |
|---|--|--|
| Negative economic impacts due to <u>Economic leakages</u> | Happens when revenue generated by tourism in destination region lost to economies of other countries Due to payments for imports of goods and services to support tourism industry Reduces revenue from tourism → ↓ locals income → ↓ government's revenue from taxes → ↓ money to improve standard of living | United National Environment Programme states → for everyone USD\$100 spent by a tourist on holiday to a developing country → US\$5 remains in local host community |
| Negative economic impacts due to <u>Overdependence</u> on tourism increasing vulnerability to sudden fall in tourist numbers | Overdependence results in vulnerability to fall in tourist numbers due to unexpected events → affect livelihoods of people Natural Disasters → can cause significant damage to tourism infrastructure → people fearing for safety may cancel or postpone plans → governments may close off affected area reducing tourist arrivals Unfavourable political situations → (same as above + logic) Outbreak of diseases → (same as above + logic) | 2019 COVID-19 Pandemic → infected 205 million people, many counries going into 'lockdown' → first half of 2020 tourist arrivals fell by 65% |

Economic downturn (tourist generating region)→
companies will attempt to cut costs, people lose jobs or get pay cuts → reduce disposable income → choose not to travel to reduce spending

| Factor | Explanation (4 points only) | Example (2 points only) |
|--|--|--|
| Preamble Negative imp needs of tour | pacts more significantly felt by locals $ ightarrow$ vertists to maintain high | ry dependent on meeting |
| Positive social impacts due to <u>Enhancing cultural</u> <u>ecosystem</u> | Protecting the environment for tourist activities enhances cultural ecosystem services Provides aesthetic, educational, recreational and spiritual benefits Aesthetic → tourists/locals get to appreciate beauty and scenery of protefcted National Park Educational → tourists learn about conservation of animals and experience traditional culture | Sanjiangyuan National Park, China → sightings of rare snow leopards drawn tourists → villagers in Angsai village run community-based tourism programme allowing tourists to stay with locals and see these leopards in the wild |
| Positive social impacts due to <u>Cultural</u> <u>Preservation</u> | Many tourists keen to learn about rich cultural heritage by participating in activities and festivals Preserves culture by Boosting local economy → create incentive to protect traditional cultural practices Planning authorities investing more money to encourage traditional practices Cultural preservation ensures knowledge and practices can be passed down | Shadow puppetry in China → ancient art form → culturally important to local communities as it contains history and traditions → innovations like VR attracted viewers and preserves culture |
| Negative social impacts due to | Traditions may lose authenticity as it undergoes commodification when demand for heritage tourism increases | Vancouver, Canada → totem poles commodified and widely available for |

2.3 Social Impacts of Tourism

| <u>Commodification</u> <u>of Cultural</u> <u>Practices and Art</u> <u>Forms</u> | Cultural rituals may be exaggerated, staged or condensed to suit needs of tourists Weakens cultural value for both locals and tourists Conflict among locals who support commodification for tourism and those who fear losing authenticity of culture | purchase as souvenirs Most inauthentic without collaboration with native tribes |
|--|--|---|
| Negative social impacts due to <u>Cultural Clashes</u> | Tourists can be insensitive to local norms → including religious customs and traditions → -ve sentiment towards tourists Tourists may negatively impact locals and environment → -ve sentiment towards tourists | Hawaii, USA → found that most locals did not wish for Hawaii to be opened up to public after COVID-19 → many tourists did not follow public safety guidelines like wearing of masks & did not respect indigenous Hawaiian culture |
| Negative social impacts due to <u>Rise in Crimes</u> | Rise in crime rates like pickpocketing due to tourists carrying large sums of money and valuables Tourists usually relaxed and off guards Tourists may also be targeted if -ve sentiments towards tourists build up | • 2017 Tourist Bus in Barcelona, Spain → attacked by anti-tourist protestors who punctured tyres and sprayed anti-tourism grafitti |

2.4 Environment Impacts of Tourism

| Factor | Explanation (4 points only) | Example (2 points only) |
|---------------------------|---|---|
| Positive environmental | • Local communities & government maintain pristine environment to attract tourists | Galapagos National Park, Ecuador → US\$100 charged to visitors entering → |

| impacts of tourism by <u>Conservation of</u> <u>natural</u> <u>environments &</u> <u>preservation of</u> <u>biodiversity</u> | Tourism revenue reinvested to fund protection of aquatic and terrestrial ecosystems by Establishing protected areas Employing and training specialised staff to take care of these ecosystems Setting up environmental education programmes | revenue channelled to conservation and upkeep of park → including hiring of park rangers |
|--|--|---|
| Positive environmental impacts of tourism by <u>Restoration of</u> <u>degraded aquatic</u> <u>and terrestrial</u> <u>ecosystems</u> | Aquatic & terrestrial sites can be tourist attractions Providing incentive to government to restore degraded ecosystems to create natural attractions Can be done by reversing or stopping degradation | Mauritius and Seychelles → coral reefs negatively affected by overfishing & unsustainable fishing methods → economically significant for tourism industry → United Nations Development Fund initiated regional project to restore ecosystem |
| Negative environmental impacts of tourism by <u>Pollution</u> | Greenhouse Emissions: travelling requires large amounts of fossil fuels to be burned → ↑ GHG Services provided by tourism like air-conditioned accommodation → ↑ GHG GHG like SO2 can cause respiratory illness Inadequate sewage facilities & improper waste disposal: Tourism generates large amount of waste → improper/no waste disposal systems result in littering & environmental degradation | Mount Everest → climbers discard tents, food containers and even human waste on slopes in the area → chemicals can contaminate soil and ground water → pollution |

| | Many accommodations do not have sewage systems → water pollution | |
|---|--|---|
| Negative environmental impacts of tourism by <u>Depletion of</u> <u>natural resources</u> <u>and threats to</u> <u>wildlife habitats</u> | Depletion in natural resources: Tourism results in overuse of natural resources like water → deplete natural resources Can lead to droughts harming people, terrestrial and aquatic systems Threat to wildlife habitats: Construction of accommodations can cause deforestation & destruction of wildlife habitats Careless tourists can trample on plants or disturb animals | Bali → draws ~3 million litres of water daily → hotels take water from public water supply → rivers in the region dry up reducing availability for plants and animals |

3.2 Effectiveness of Stakeholders in Influencing Sustainable Tourism Development

| Factor | Explanation (4 points only) | Example (2 points only) |
|---|--|---|
| Preamble • Potential fac: • Stake • Stake • Stake • Stake • Stake | tors for comparison cholders may have different understanding inable tourism development cholders have different amounts of control cholders have different priorities which ma | s and measurements of over resources kes negotiation challenging |
| Effectiveness of <u>Governments</u> | Establish policies & create plans: formation of regulations that have to be adhered to → minimise damage to environment & maximising benefits to locals Enforcing regulations: includes regulations on types of tourism activity and number of tourists who can enter | Sentosa, Singapore → authorities bring together stakeholders to develop sustainable plans Includes conserving rich heritage, protecting biodiversity and achieving |

| | Enforcement is critical to ensure adherence Limitations: Poor enforcement → governments with little resources and political influence may be unable to enforce regulations → hinder sustainability Decision to prioritise economic development → neglect environmental dimensions | carbon-neutral status b 2030 |
|--|--|---|
| Effectiveness of International Organisations | Offer knowledge, financial and technical expertise to provide assistance Offer consultancy on how to achieve sustainability, provide financial assistance and raise public awareness on how to contribute to sustainability Limitations: Lack of understanding of local contexts → members may have different perspectives regarding an issue and may not understand local environmental issues Lack of funding → usually nonprofit → challenging to choose projects | Handicraft villages in Ha Tay Province, Vietnam the United Nations World Tourism Organisation Developed marketing plan with villagers to encourage independent travellers and tour operators to visit villages (consultancy) Financial aid to carry out small-scale infrastructural improvements like public toilets (financial assistance) |
| Effectiveness of <u>Businesses</u> | May have an incentive to pursue sustainability to maintain profitability (protecting natural environment if it's a tourist attraction) Have financial resources Can seek advice from other stakeholders regarding sustainable practices Participate in decision-making for sustainable development Limitations: | Quicksilver Cruises in Australia → specialises in tours of Great Barrier Reef → works with planning authorities to promote ecotourism Research team of marine biologists observe and monitor marine ecosystem → help planning |

| | Compromising sustainable practices to survive → may prioritise profits Different understanding/measuring of sustainability → may end up greenwashing, marketing as sustainable when their practices may not be so | authorities manage the reef |
|-------------------------------------|---|---|
| Effectiveness of Locals | Can seek advice from other stakeholders regarding sustainable practices → locals may not have necessary knowledge on sustainability → can seek help from other stakeholders to adopt tried and tested practices Participating in decision-making → locals have knowledge specific to their environment → they can suggest ways to minimise harmful impacts while maximising benefit to their community Done through community-based tourism which prioritises participation of local community → ensure benefits stay in local community Limitations: Lack of financial or technical assistance Prioritising economic benefits over sustainability | Singapore → locals can seek guidance from National Environmental Agency to pursue sustainable tourism practices like waste management and recycling → when hosting international events & conventions |
| Effectiveness of <u>Tourists</u> | Develop genuine interest in tourist destination and seek to enhance its environment → when there's a genuine interest, they are more motivated to ensure environment is | • Tiger Tops Elephant Camp in Nepal → ethical elephant camp where elephants freely roam in jungle with no |

| conserved \rightarrow involve | routine imposed \rightarrow |
|---|-------------------------------|
| themselves in environmental | tourism revenue |
| conservation projects | generated can be |
| Interact responsibly with | used for conservation |
| environment and people \rightarrow | and upkeep of |
| read up on local practices & | animals |
| culture and be mindful of | |
| behaviour when travelling \rightarrow | |
| show respect | |
| Limitations: | |
| Some sustainable tourism | |
| options may be out of budget | |
| Lack of clear information on | |
| 'sustainable' tourism options | |
| | |

3.3 Effectiveness of Stakeholders in Influencing Sustainable Tourism Development

| Factor | Explanation (4 points only) | Example (2 points only) |
|---|--|---|
| Preamble Ecotourism a improving po | and CBT can be PPT as well (interconnecte ors' benefits | ed) as long as they focus on |
| <u>Ecotourism</u> | Tourism that takes place in natural areas which are scenic and allow tourists to experience nature Strategy Educate and ↑ tourists' appreciation of nature → through interaction with nature → ↑ willingness to take action and minimise damage to environment Measures to minimise negative impacts on environment → Revenue channelled into conservation by hiring park rangers to enforce regulations and minimise damage Hard vs Soft Ecotourism | Galapagos Islands in Ecuador → attract many touriss due to unique flor aand fauna 97% of islands' total area is declared a national park with 3% for humans to live Number of visitors allowed is limited → minimise disturbances |

| | Stronger vs moderate commitment Smaller vs larger no. of tourists Few to no services provided vs often provided Supplied by specialist tour operators vs mass-market tour operators Limitations: Uncertainty over continuity of efforts → if too popular, ↑ damage to environment, X sustainable Uncertainty over involving local communities → locals may X have sufficient skills → non-locals hired → benefits to locals not maximised | |
|--|--|---|
| <u>Community-based</u> <u>Tourism</u> | Small-scale tourism experience that is managed by local communities including homestays. Maximise locals involvement & maximising benefit to them. Strategy Increase tourists' appreciation of local cultures & environment → promote interactions b/w locals & tourists to develop respect for culture and environment Encourage local community to participate in decision-making → locals have greater knowledge of their needs → their decisions ensure these needs are met sustainably → locals can continue to be involved in tourism and thrive Put in place measures to increase economic and social benefits to locals → (econ) | Binsar Wildlife Sanctuary → tourists can live with local host family and participate in daily activities related to local cultures → ↑ appreciation and motivation to preserve their heritage |

| | locals encouraged to innovate & set up businesses that caters to tourists' needs → provide local employment → ↑ economic benefit (social) revenue generated can be channelled to community projects → ↑ social wellbeing, education and healthcare Limitations: Loss of culture → commodification Competition with large-scale tourism developments | |
|-------------------------|---|---|
| <u>Pro-Poor Tourism</u> | Tourism development that focuses on improving livelihoods of the poor through training and access to microfinance Strategy Training → locals able to learn new skills & gain employment Access to microfinance → enables poor to set up businesses like homestays & restaurants → communication materials designed to allow them to apply for microfinance Limitations: Unable to significantly reduce poverty as compared to direct investment in social services → difficult to channel benefits to poor compared to direct investment in social services → the poor may X have skills to sustain business Economic benefits highly unevenly distributed → most channelled to non-poor locals → non-poor locals have greater access to financial grants and | China's Three Parallel Rivers Region, a UNESCO World Natural Heritage Site tourists attracted to visit and enjoy scenic views and experience village life villagers can set up homestays with the financial assistance to earn income |

| microfinancing as more reliable |
|----------------------------------|
| by banks and donors $ ightarrow$ |
| non-poor become wealthier |