

## **Tourism**

### ***Tourism growth***

#### **Motivation to travel**

- Need for relaxation

#### **Phuket, Thailand**

A survey found that one of the main reasons why British tourists visit Phuket, Thailand, an island famous for its scenic beaches, is to rest and relax

- Need to achieve personal growth and self-fulfillment

#### **Bali, Indonesia**

Many cooking schools have sprung up in Bali to cater to tourists' desire to learn more about Balinese culture

- Need for unique experiences

#### **Antarctica**

Tourism numbers in Antarctica have increased significantly in the last two decades as tourists' interest in one of the last uninhabited regions increased 🔥

#### **Ability to travel**

- Increase in disposable income

#### **China**

In China, as GDP quadrupled, international tourism grew from about nine million departures in 1999, to 154 million departures in 2019

- Increase in disposable income

#### **China**

In 2015, the Chinese government encouraged employers to give workers half a day of paid leave on Fridays during the summer months to help boost domestic tourism.

- Business innovations in tourism-related industries

#### **Search engines**

Websites such as Expedia and Trivago have search engines specifically for travellers to compare trip reviews and prices, and book their trips directly on the website.

- Lower transportation costs

#### **Budget airlines**

Budget airlines such as AirAsia, which offer significantly lower prices, have become increasingly popular for travel within Southeast Asia

- Lower accommodation costs

### **AirBnB**

It connects people who want to rent their homes out to tourists, increasing the variety of accommodation that tourists can stay in. In 2019, it was estimated that more than 2 million people stayed in an Airbnb property every day.

### Mobility to travel

- Expansion of private transport services and infrastructure

### **Singapore T4**

The opening of Changi Airport's Terminal 4 means that there can be more flights from other parts of Asia to Singapore, making travel within the region more convenient

- Introduction of new modes of travel

### **Shinkansen**

In 1965, a conventional train would take 6 hours and 40 minutes to travel from Tokyo to Osaka. With the introduction of the Shinkansen or bullet train, the trip has been shortened to 3 hours and 10 minutes.

### **Flights**

In the early 1950s, a commercial flight from Singapore to London would take two to four days, with many stopovers in between. Today, air travel would take 14 hours without any stopover.

- Increased private car ownership

### **US**

In the 1950s, private car ownership in the US increased significantly, resulting in an increase in domestic tourism.

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### ***Tourism development***

- Exploration

### **Jaco Island, Timor Leste**

Few international visitors due to inaccessible location and lack of tourism facilities

- Involvement

**Kuang Si Waterfall, Laos**

Authorities invested money to improve facilities at the waterfall

- Development

**Phu Quoc island, Vietnam**

In 2019, it had a rapid increase in tourist arrivals to 5.1 million

- Consolidation

**Goa, India**

In 2019, foreign tourists (7 million) outnumber locals (1.5 million)

- Stagnation

**Hawaii, USA (1990s to 2000s)**

Tourism arrivals and expenditures began to decline in the late 1990s and early 2000s

- Decline

**Blackpool, UK (1990s)**

Lost its attractiveness due to competition from other European coastal with more competitive pricing

- Rejuvenation

**Blackpool, UK (present)**

Re-marketed itself as a muslim-friendly and disabled-friendly destination

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***Economic impacts***

- Employment opportunities in formal and informal tourism sectors (+)

**Thailand**

According to a study done in 2020, up to 3.5 million locals are informally employed in the tourism sector in Thailand. Most of these locals mainly provided accommodation or food services to tourists

- Income generation from tourists' spending on consumer goods and services (+)

**Maldives**

In the 1980s, the Maldives was one of the world's poorest countries. Today, its economy has grown due to the tourism opportunities offered by its natural landscape, resulting in low poverty rates.

- Economic leakages resulting in less tourism revenue (-)

### **UNEP**

According to the United Nations Environment Programme, for every US\$100 spent by a tourist on holiday to a developing country, only US\$5 remains in the local host community.

- Overdependence on tourism, which increases vulnerability to sudden fall in tourist numbers (-)

### **Caribbean Islands**

In 2017, parts of the Caribbean Islands were struck by a succession of powerful hurricanes. About 95% of the buildings there were destroyed resulting in one million fewer tourist arrivals and an estimated loss of revenue of over US\$700 million.

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### ***Social impacts***

- Cultural preservation (+)

### **Bhutan**

The government imposes a daily fee on tourists, which helps fund cultural preservation projects.

- Enhancing cultural ecosystem services (+)

### **Great Barrier Reef, Australia**

The Great Barrier Reef enhances cultural ecosystem services by providing opportunities for recreational diving, snorkeling, and educational tours.

- Commodification of cultural rituals and artforms (-)

### **Hawaii — Hula dance**

Originally a sacred dance and storytelling practice, the hula has been commercialized for tourist entertainment in Hawaii.

- Cultural clashes (-)

### **Uluru, Australia**

Became a popular tourist destination for visitors who would climb the rock despite its deep spiritual significance which led to the eventual banning of climbing Uluru in 2019, in an effort to respect and protect the cultural significance of the site.

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### ***Environmental impacts***

- Conservation of natural environments and preservation of biodiversity (+)

#### **Galapagos Islands, Ecuador**

97% of the total area is marked as a nature reserve, hence only 3% is left for residential and recreational use.

- Restoration of degraded aquatic and terrestrial ecosystems (+)

#### **Yosemite National Park, California USA**

The entry fee (\$35/vehicle) is used to finance habitat restoration and wildlife research

- Pollution (-)

#### **Maya Bay, Thailand**

Closed for 2 months in 2024 to allow the ecosystem to recover from the damage caused by excessive tourism and pollution.

- Depletion of natural resources and threats to wildlife habitats (-)

#### **Boracay Island, Philippines**

Wastewater generated by excess tourism was being emptied into the sea, endangering marine life and resulting in the depletion of natural resources.

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### ***Stakeholders influencing sustainable development***

- Governments

#### **Sentosa, Singapore**

The authorities bring together different stakeholders to develop a series of plans to enable the island to become more sustainable, including achieving carbon-neutral status by 2030.

- International organizations

#### **UN SDG Fund**

The United Nations Sustainable Development Goals Fund supports conservation efforts in Tanzania, ensuring the environmental development of the region.

- Businesses

**Quicksilver Cruises, Australia**

Works with the planning authorities to promote ecotourism.

- Locals

**Singapore**

Locals can seek guidance from the National Environment Agency to pursue sustainable tourism practices when hosting international events, meetings and conventions.

- Tourists

**Bali, Indonesia**

Tourists should be aware that they have to dress modestly when visiting religious sites.

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***Different approaches in achieving sustainable tourism***

- Ecotourism

**Galapagos Islands, Ecuador**

Tourists are not allowed to explore the islands on their own. A guide, who educates tourists, is required at each site.

- Community-based Tourism

**Kayan Jungle Experience, Thailand**

The Karen hill tribe in northern Thailand offers community-based tourism experiences where visitors stay in the village and learn about their traditional farming practices, handicrafts, and spiritual beliefs.

- Pro-poor tourism

**India**

India's rural tourism initiative connects tourists with rural communities where locals offer homestays and cultural experiences.

## **Climate**

### ***Factors impacting air temperature***

- Latitude

#### **Beijing, China vs SG**

Beijing, China (40°N of the equator) has temperature averaging 12°C while Singapore (1°N of the equator) has temperatures averaging 29°C.

- Altitude

#### **Genting Highlands**

Average temperatures at Genting Highlands (altitude of 1700m above sea level) is about 21°C. Average temperatures in the surrounding areas which are at sea level is 32°C.

- Nature of surfaces

#### **CBD vs Macritchie reservoir**

Night-time temperatures at Singapore's Central Business District were found to be 2°C warmer than the area near Macritchie reservoir, which has very dense vegetation.

- Distance from the sea

#### **Alaska, USA**

Anchorage, a coastal city in Alaska, USA, has a lower annual temperature range of 23°C. Fairbanks, an inland city in Alaska, USA, has a higher annual temperature range of 40°C.

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### ***Natural variability of climate***

- Sunspot occurrences

#### **The Halloween Storms (2003)**

A series of intense solar flares affected Earth's climate.

- Large-scale volcanic eruptions

#### **Mt Pinatubo, Philippines**

The volcanic eruption of Mount Pinatubo in 1991 led to a drop in average global temperature of about 0.6°C over 15 months after the eruption.

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### *Anthropogenic changes contributing to climate change*

- Burning of fossil fuels

#### **Fossil fuels**

The use of fossil fuels increased steeply since the start of the industrial revolution in the 1880s, contributing to more than 35 billion tonnes of carbon dioxide emissions per year.

- Changing land use

#### **Agriculture**

In paddy rice fields, decomposition is rapid due to the high amount of moisture in the soil, which contributes to 5-20% of total methane emissions.

#### **Urbanisation**

Cities consume about 78% of the world's energy and contribute significantly to the emission of greenhouse gases.

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### *Impacts of climate change on natural systems*

#### Natural impacts

- Changes to ocean circulations

#### **Atlantic Ocean**

The ocean current in the Atlantic Ocean has slowed by about 15%

- Changes in precipitation on land

#### **The Poles, parts of Southeast Asia and central Africa**

There has been recordings of increased precipitation and occurrences of excess rainfall in the Poles, parts of Southeast Asia and central Africa.

#### Aquatic impacts

- Threats to coral reefs

#### **Great Barrier Reef, Australia**

The Great Barrier Reef in Australia was severely affected in 2016 and 2017 due to rising sea temperatures. Up to two-thirds of corals died in the northern section of the reef.

- Ocean Acidification

#### **Great Barrier Reef, Australia**

Average coral cover in the Great Barrier Reef has been dropped to about 30% of what it was in the 1960s, in part due to ocean acidification.



### **Industrial Revolution (1800s)**

Since the Industrial Revolution (1800s), ocean acidity has increased by 25%.

- Disruptions of marine food webs

### **Changes in geographic distribution**

Tropical species such as parrotfish and rabbitfish have migrated polewards. A study found that diversity of species in tropical waters has dropped significantly in the last 50 years.

### Terrestrial impacts

- Threats to flora and fauna

### **Changes in geographic distribution**

About 170 species of birds tracked in North America have expanded their range northwards by 50km on average during the past four decades

### **Impacts of droughts**

The droughts in California, USA between 2012 to 2016 contributed to the death of 102 million forest trees due to the lack of water and spread of diseases.

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## ***Impact of climate change on human systems***

### Direct impacts

- Extreme weather events

### **Europe 2003 heatwave**

About 70,000 people died from the heat wave which lasted for two weeks.

### Indirect impacts

- Affects provisioning ecosystem services

### **2020 drought in Thailand**

Lack of rain and shorter monsoon season resulted in dried up reservoirs and barren land, thus farmers were unable to grow crops.

- Affects regulating ecosystem services

### **Increase in vector-borne diseases**

Before 2018, mosquitoes were non-existent in the mountainous regions of Bhutan as they are usually too cold for mosquitoes to breed. However, in 2019 Bhutan suffered the country's first national dengue epidemic where many parts of the country reported cases of the dengue virus.

- Affects cultural ecosystem services

### **Aletsch Glacier, Swiss Alps**

Rising global temperatures have caused glaciers in the Swiss Alps to melt at an accelerated rate. The iconic Aletsch Glacier, the largest glacier in the Alps, has been steadily retreating, losing significant ice mass each year.

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## ***Building community resilience to climate change***

### **Mitigation strategies**

- International agreements and cooperation

### **Paris Climate Agreement 2015**

The aim of the Paris Climate Agreement is to limit surface temperature rise to 1.5C. It was legally adopted by 191 Parties in Paris, France.

- Use of low-carbon technologies

### **Sleipner Gas Field, Norway**

This is one of the longest-running carbon capture and storage (CCS) projects in the world. Since 1996, the facility has been capturing CO2 from natural gas production and injecting it into deep saline aquifers under the North Sea.

- Use of clean energy sources

### **Singapore**

By 2030, Singapore wants to increase its solar capacity to meet about 4% of Singapore's total electricity demand today.

- Changes in consumption patterns

### **United states**

In the United States about 85% of all textiles are discarded annually. Many of these clothes can take up to 200 years to decompose, releasing methane and other harmful gases into the atmosphere during the process.

### **Mitigation strategies that enhance carbon sinks**

- Reducing deforestation

### **Amazon Region Protected Areas**

Restricts land-use change, particularly the conversion of forests to agricultural land, such as cattle ranching or soy production. These efforts help maintain the forest's carbon sequestration capacity and protect biodiversity.

- Restoring mangroves

### **Eden Reforestation Projects in Madagascar**

In Madagascar, Eden Reforestation Projects has restored large areas of mangroves along the coastlines. Since 2007, Eden has planted over 16 million mangrove trees in the country.

### Adaptation strategies

- Structural adaptation strategies

### **Stamford Detention Tank, Singapore**

Allows excess water to flow into the detention tank and be stored there temporarily.

- Technological approaches

### **Singapore “30 by 30” plan**

Aims to increase local food supply to account for 30% of residents’ nutritional needs by 2030 through the use of high-tech farms.

- Social approaches

### **Nepal**

In Nepal, to cope with prolonged drought, communities are taught that they can plant more drought-resistant crops such as apples.

- Institutional approaches

### **ASEAN Climate Outlook Forum**

Enables countries to collaboratively develop climate outlooks for the region. Using the outlooks, countries can make decision to manage and adapt to climate risks.