

Answer **all** questions.

1 Cluster 1: Geography in Everyday Life

A group of students in the United Kingdom wanted to investigate causes of air pollution in their city area and residents' opinions on strategies taken to reduce it. They went to the city area on a weekday and used a closed-ended questionnaire survey to collect the views of the residents.

They divided themselves into two groups, with one group interviewing the first 50 residents who are less than 50 years old and the other group interviewing the first 50 residents who are above 50 years old. Each group of students interviewed 50 residents.

They conducted their questionnaire at the location labelled X shown in Fig.1.1. A copy of their questionnaire is in Fig. 1.2 (Insert).

Land use map of the city area in the United Kingdom



Key:

Household goods store	
Supermarket	
Convenience goods store	C
Specialist store non-food (e.g. florist, travel agent)	Sp
Personal services (e.g. hairdresser, nail parlour)	P
Charity shop	Ch
Cafe	CE
Offices	O
Vacant shop space	V

Fig. 1.1

(a) Explain the advantages and a safety concern of conducting their questionnaire at location X. [3]

- One advantage would be a **high footfall /pedestrian traffic** at location X as it leads to the bus station so students would be able to get respondents more easily.
- They would also be able to **seek shelter** at the bus station if it rains.
- It may not be very safe for the students as they are **standing at a small road** at the entrance / exit to the bus station and **accidents may happen**.

(b) The students collected information on the types of air pollution and their origin. They represented the information in a comparative bar graph.

Table 1.1 shows the information collected by the students and Fig. 1.3 shows their partially completed graph.

Table 1.1

Types of air pollution and their origin

types of air pollution \ origin of air pollution (%)	transportation	fuel burning	industrial processes	construction and agriculture
carbon monoxide	85	5	10	0
dust and airborne particles	1	2	2	95
nitrogen oxides	49	47	4	0
sulfur oxides	3	85	10	2
others	35	3	62	0

(i) Use the information in Table 1.1 to complete the bar graph in Fig.1.3 for transportation and industrial processes. [2]

Answer:

Types of air pollution and their source of origin

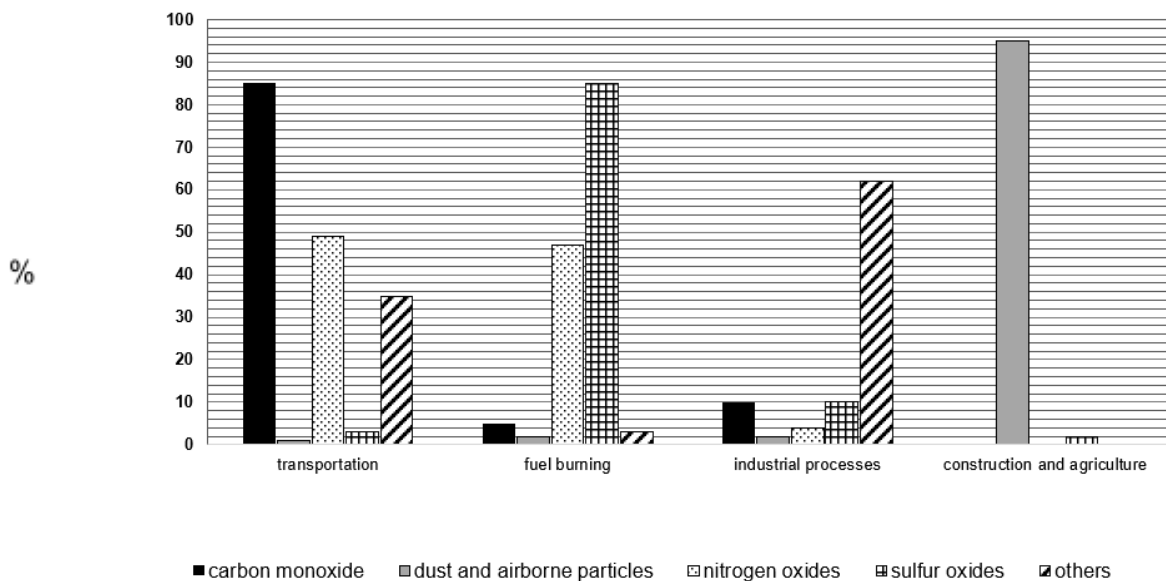


Fig. 1.3

(ii) Describe **one other** graphical method the students could use to present the data in Table 1.1.[2]

- They could plot a series of **pie charts**, one for each origin of air pollutant.

- Each **segment** will show the **percentage** for each origin of air pollutant.

(c) The students created a list of strategies to reduce air pollution and classified them as nature-based or policy-based. They wanted to test the hypothesis: *‘People are more supportive of nature-based strategies compared to policy-based strategies to reduce air pollution’*.

When conducting the questionnaire, the students decided to show respondents photographs of how other cities have adopted these strategies to reduce pollution, as seen in Figs. 1.4A (Insert) and 1.4B (Insert).

Table 1.2 shows the results of the close-ended questionnaire survey conducted on respondents’ opinion of strategies to reduce air pollution in their city.

Table 1.2

Respondents’ opinion of strategies to reduce air pollution in their city

strategies to reduce air pollution	classification	<50 years old		> 50 years old	
		support the strategy	do not support the strategy	support the strategy	do not support the strategy
plant more trees	nature-based	41	9	32	18
promote green walls and green roofs	nature-based	30	20	29	21
create more green spaces and parks	nature-based	35	15	39	11
build extensive network of cycling lanes	policy-based	23	27	12	38
provide subsidies for electric cars	policy-based	39	11	42	8
introduce car free days on weekends	policy-based	21	29	9	41

(i) To what extent does the data in Table 1.2 support the students’ hypothesis? [4]

- The data supports the students’ hypothesis to a **large extent**.
- From Table 1.2, nature-based strategies garnered a **higher** level of support, with a total of **206** responses compared to policy-based strategies which had a lower level support at a total of **146** responses.
- A **larger** number of **74 people** are also supportive of nature-based strategies like ‘create more green spaces and parks’ compared to a **smaller** number of **35 people** who are supportive of policy-based strategies such as ‘build extensive network of cycling lanes’. OR A **larger** number of **73 people** are supportive of nature-based strategies like ‘plant more trees’ compared to a **smaller** number of **30 people** who are supportive of policy-based strategies such as ‘introduce car free days on weekends’.

- However, there is an exception. A **large** number of **81 people are supportive of policy-based strategies** which is to 'provide subsidies of electric cars'. This is higher than any other nature-based strategies.

(ii) With reference to Table 1.2, explain some factors which could have influenced how supportive respondents are of the various strategies.

[3]

- One factor is **age**. Older people are mostly not in favour of strategies that could be physically more demanding such as cycling.
- Another factor could be concerns about **cost**. The approach of 'provide subsidies for electric cars' received strong support because it lowers the cost of purchasing a car.
- Another factor could be **lack of convenience**. Many people were not supportive of 'car-free days on weekends' because it would require them to walk, take public transport, or cycle which could be troublesome and time-consuming.

(d) Evaluate the data collection methods used by the students.

[6]

For:

- Their sample size of **100 people** is large enough to **conduct a reasonable analysis of data**.
- The use of a **close ended questionnaire** with **pre-defined responses** makes it **easy for respondents to complete the survey**.
- Collecting quantitative data makes it **easier** for students to **analyse data** to better **draw conclusions / see patterns**.
- Students included a **wide range** of nature-based and policy-based **strategies** and classified them, which could help **gain a better understanding** of residents' opinions on strategies to reduce air pollution in their city area.

Against:

- Showing respondents photographs of how other cities implemented these strategies could possibly **sway / influence their decision to be supportive** of the strategy. This could have led to higher scores for 'plant more trees'.
- The use of quota sampling / convenience sampling to select respondents introduces **bias** and **may not accurately represent the views of various groups within society**, such as those of different genders and ethnicities.
- Students **could have interviewed the same person more than once** at the busy bus station.
- As students conducted their survey at the entrance / exit of a bus station, most of their respondents would be people who are **taking public buses**, and it **may not represent the views of others** who take private transport or use other forms of public transport such as train / rail.

(accept any 6 valid points with at least one point on each side)

[Total: 20]

2 Cluster 2: Tourism

(a) Study Fig. 2.1, which shows tourist arrivals to Thailand from 2015 to 2023.

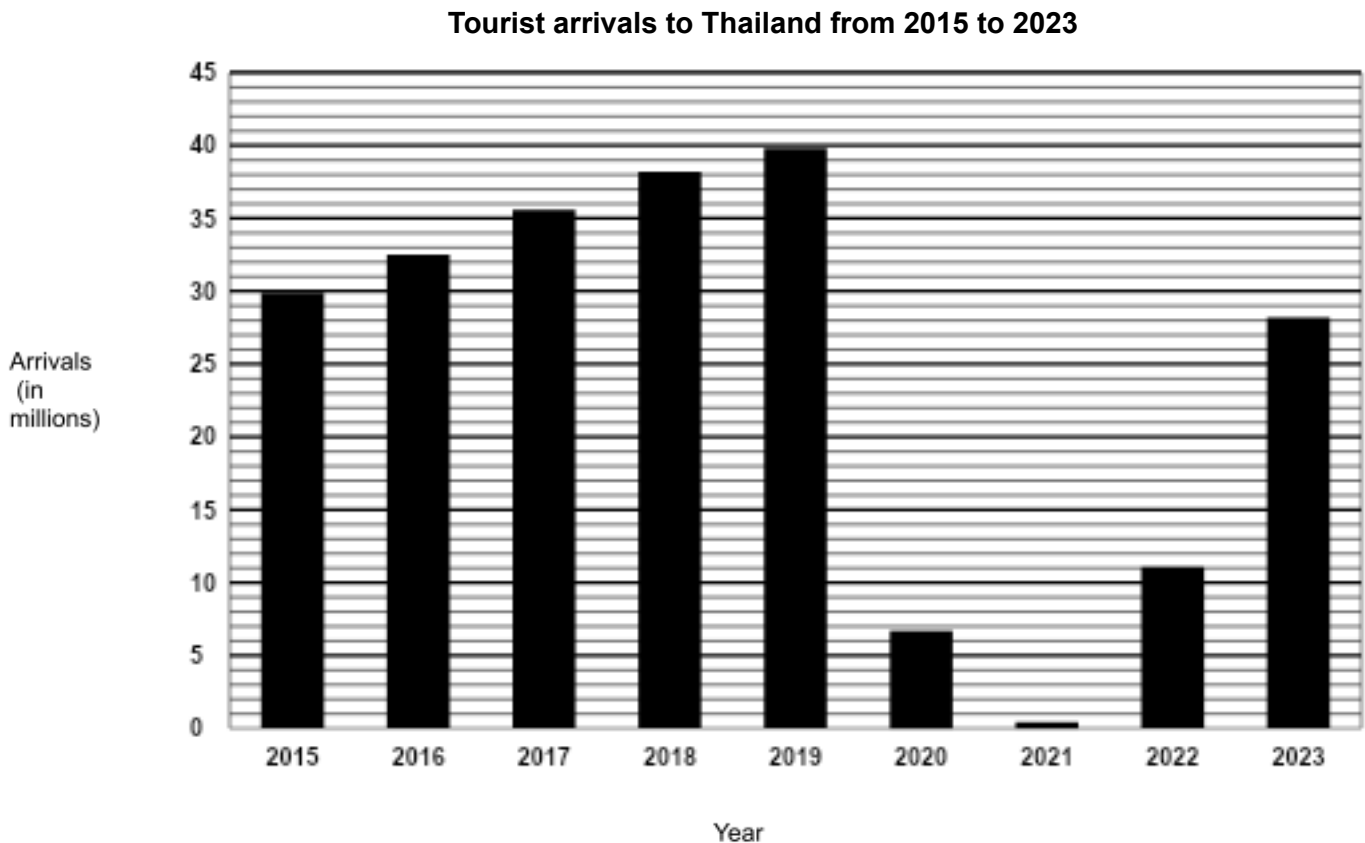


Fig. 2.1

Using Fig. 2.1, describe the trends in tourist arrivals to Thailand from 2015 to 2023.

[4]

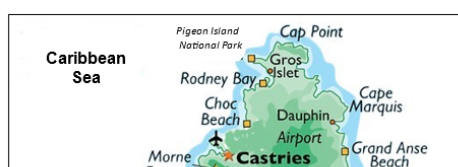
- Overall, there is a decrease in tourist arrivals to Thailand from 30 million in 2015 to 28 million in 2023, **a decrease of 2 million tourist arrivals.**
- From 2015 to 2019, tourist arrivals increased gradually. From 2015, tourist arrivals increased from 30 million to 39.8 million in 2019, **an increase of 9.8 million.**
- However, from 2019 to 2021 there was a steep decrease in tourist arrivals. Tourist arrivals decreased from 39.8 million in 2019 to 0.4 million in 2021, **a decrease of 39.4 million.**
- From 2021 to 2023, tourist arrivals increased sharply from 0.4 million to 28 million in 2023, **an increase of 27.6 million.**

(b) Study Fig. 2.2A (Insert), which shows the location of hotels in Saint Lucia, a country in the Caribbean, and Fig.

Fig. 2.2A for Question 1
Location of hotels in Saint Lucia



Fig. 2.2B for Question 1
Other information about Saint Lucia



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2.2B (Insert), which shows other information about Saint Lucia.

(i) Using Fig. 2.2A, describe the location of hotels in Saint Lucia. [2]

- Most hotels are located at the **north / northwestern coast** of Saint Lucia such as **Bay Gardens Beach Resort**.
- Some are also located at the **southwestern coast** such as the **Anse Chastanet hotel**.

(ii) Using Figs. 2.2A and 2.2B, account for the location of hotels in Saint Lucia. [3]

- Most resorts are found at the **North / northwest** coast of Saint Lucia as it is **near the Vigie Airport** which makes it **accessible** to tourists.
- There are also many **beaches / bays** at the northwestern coast which allow tourists to **engage in beach activities / diving / snorkelling**.
- It is also near the **Pigeon Island National Park in the North** which would appeal to tourists who are keen on **nature walks / hiking / bird watching**.

(c) Describe how online media has influenced the rise of niche travel. [2]

- Online media has helped to **market** the **services of specialist tour operators** who provide tourism experiences for niche travel.

- Online media also creates interest in niche travel by **raising awareness of specific destinations** that mass-market tour operators typically do not offer, and which are less commonly chosen compared to standard package holidays.

(d) Describe how tourism can result in positive environmental impacts.

[4]

- **Degraded** aquatic and terrestrial ecosystems can be **restored**, and this can be done by stopping or **reversing** degradation.
- Tourism revenue can be used to **fund the protection** of aquatic and terrestrial ecosystems, protecting biodiversity.
- With the rise of tourism, local authorities in tourist destinations may **establish protected areas or National Parks** where development is restricted in order to ensure that habitats are undisturbed.
- In addition, **environmental education programmes** can be set up for tourists to encourage them to care for these ecosystems.

[Total: 15]

3 Cluster 3: Climate

(a) Explain why corals and mangroves are important coastal ecosystems.

[3]

- Mangroves are important as they **absorb and store greenhouse gases** in their soil up to four times as much as forests. They function as carbon sinks and help reduce carbon dioxide levels in the atmosphere, thus mitigating global warming.
- Mangroves **filter pollutants in rivers** and prevent them from reaching the oceans and harming corals and aquatic life.
- Corals are **home to millions of aquatic species like fish and seahorses**. When corals die, these species lose their food source and habitat. Their populations may decline, affecting other species that depend on them. Thus, the entire ecosystem is affected.
- Mangroves and corals offer **protection against coastal floods** by acting as natural barriers. They break the force of incoming waves and reduce their energy before they reach the shore.

(accept any 3 valid points)

- (b) Study Fig.3.1A (Insert), which shows the population density of the Netherlands and Fig. 3.1B (Insert), which shows a simplified relief map of the Netherlands.

Population density of the Netherlands



Fig.3.1A

Simplified relief map of the Netherlands

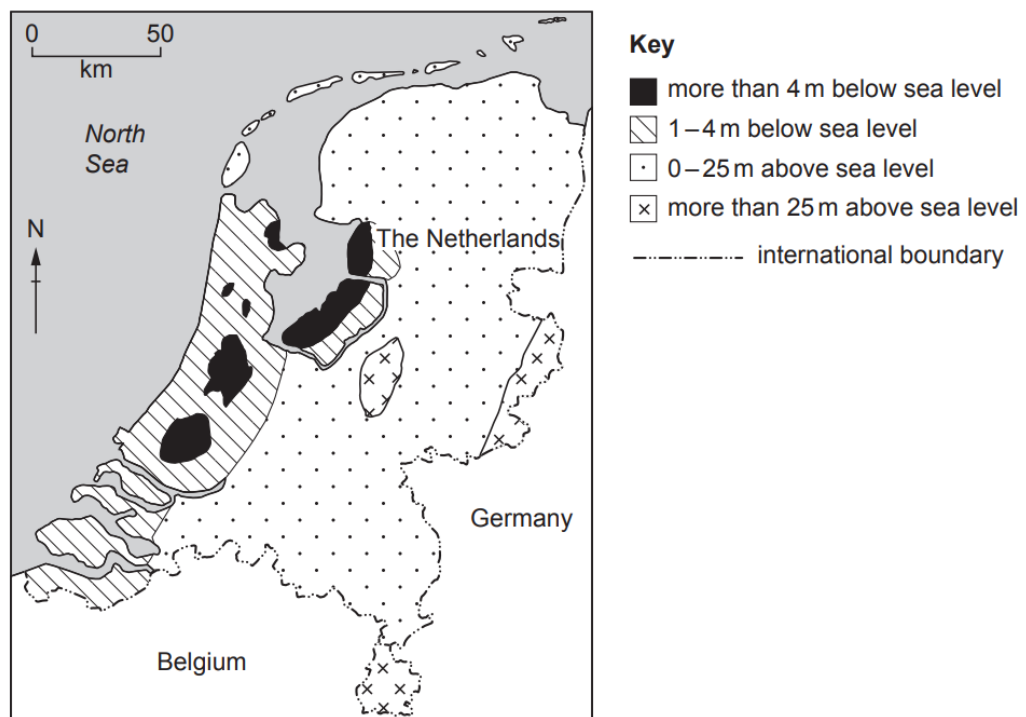


Fig.3.1B

Using Figs. 3.1A and 3.1B, explain why the Netherlands faces severe threat from climate change.[3]

- The Netherlands faces severe threat of climate change as it has a **very long coastline** (about 350km), facing the North Sea, which makes it vulnerable to flooding / sea level rise.

- About one-third of The Netherlands is also **low-lying** at more than **4m below sea level and 1-4m below sea level**. These areas face the threat of being **submerged** when sea levels rise.
- **Population density** is the **highest** at more than **1000 people per km² in areas along the coast**. People living at these coastal areas are more likely to be exposed to hazards such as storm surges and sea level rise. This can lead to **flooding**, resulting in extensive damage to property and infrastructure, as well as loss of lives.

(c) 'Structural adaptation strategies are more effective than social adaptation strategies in building community resilience to climate change.'

How far do you agree with this statement? Explain your answer.

[9]

Structural adaption strategies include **seawalls**, where a wall is constructed along the coast to prevent the sea from advancing onto the land. It protects people, properties and environments from coastal floods. For example, seawalls are constructed at East Coast Park in Singapore to protect the coastline from sea level rise. **Polders** can also be constructed at coastal areas. Low-lying land in the polder is surrounded and protected by barriers known as dykes. Excess water is then pumped out from the polder and this method protects people, properties and environments from sea level rise and coastal floods. For example, polders have been constructed in The Netherlands to protect communities from river and sea flooding. **Water storage tanks** can be built to store excess rainwater during periods of excessive rainfall to slow the water from rushing into canals and drains. This prevents flooding in the canals and drains. For example, the Stamford Detention Tank built in Singapore allows excess water to flow into the detention tank and be stored there temporarily. When sensors detect that water levels in drains have fallen, water in the detention tank will be released back into the drains.

Social adaptation strategies include **raising awareness and educating communities** on how to respond to impacts of climate change. These allow communities to be aware of the warning signs of possible climatic hazards and take appropriate steps to protect themselves and increase community resilience. **For example, in Nepal, to cope with prolonged drought, communities are taught that they can plant more drought-resistant crops such as apples.** In Singapore, the public is educated on what to do when a flash flood occurs, or how to prevent heat stress injuries during warm weather. For instance, during periods of hot weather, people are advised to **keep hydrated** and watch for early signs of heat stress. This reduces injuries and economic losses.

I agree with the statement to a **small extent** as while it is true that structural approaches are effective in offering immediate protection of the low-lying areas from coastal floods, **climate change can result in other risks other than just coastal flooding.** These risks include **droughts** which will result in famine, higher incidence of insect-borne diseases and **heat waves**. **Structural approaches will not be able to protect communities from such risks.** Social approaches can raise public awareness of what people can do in the event of hazards, such as heat waves, which can be caused by climate change. **The effectiveness of strategies also varies depending on the specific context and conditions of each location.** Hence, a **combination of both approaches will be crucial** to build community resilience to climate change.

Level	Marks	Generic Level Descriptors for 9-Mark AO3 Questions
3	7 - 9	Develops arguments that supports both sides of the discussion clearly using a range of points with good elaboration. Examples used demonstrate a comprehensive understanding of the issue or phenomenon. Evaluation is derived from a well-reasoned consideration of the arguments.
2	4 - 6	Develops arguments that support one side of the discussion well using one or two points with some elaboration. Example(s) used demonstrate a good understanding of the issue or phenomenon. Evaluation is well supported by arguments.
1	1 - 3	Arguments are unclear with limited description or may be listed. No examples provided or examples are generic, demonstrating a basic understanding of the issue or phenomenon. Evaluation is simple, missing or unclear.
0	0	No creditworthy response

[Total: 15]

Copyright Acknowledgements:

Question 1(a)	Figure 1.1	© http://www.cambridgeinternational/igcse/2024
Question 1(b)	Figure 1.3	© http://www.cambridgeinternational/igcse/2024
Question 1(c)	Figure 1.4A	© https://www.theguardian.com/environment/2023/feb/01/planting-trees-cities-cut-deaths-summer-heat-study
Question 1(c)	Figure 1.4B	© https://www.stefanoboeriarchitetti.net/en/project/vertical-forest
Question 2(a)	Figure 2.1	© https://www.statista.com/statistics/994693/thailand-number-international-tourist-arrivals/
Question 2(b)	Figure 2.2A	© https://www.pinterest.com/pin/pinrepincom--1829656091200542/
	Figure 2.2B	© https://www.worldatlas.com/maps/saint-lucia

Question 2(c)	Figure 2.3	© https://www.huawei.com/en/tech4all/stories/restoring-mauritius-coral-reef-ecosystem
Question 3(b)	Figure 3.1A Figure 3.1B	© http://www.cambridgeinternational/igcse/2023 © http://www.cambridgeinternational/igcse/2023

Additional page

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