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SCHOLARSHIP EXEMPLAR



Mana Tohu Mātauranga o Aotearoa
New Zealand Qualifications Authority

Scholarship 2025 Geography

Time allowed: Three hours
Total score: 24

Check that the National Student Number (NSN) on your admission slip is the same as the number at the top of this page.

You should answer ALL the questions in this booklet.

Pull out Resource Booklet 93401R from the centre of this booklet.

If you need more room for any answer, use the extra space provided at the back of this booklet.

Check that this booklet has pages 2–24 in the correct order and that none of these pages is blank.

Do not write in the margins (XXXX). This area will be cut off when the booklet is marked.

YOU MUST HAND THIS BOOKLET TO THE SUPERVISOR AT THE END OF THE EXAMINATION.

INSTRUCTIONS

The materials in the resource booklet will enable you to become familiar with the theme and contexts of this examination: **extreme natural events in a global context**.

Information to answer any question can be taken from any resource.

Your answers to ALL three questions must include:

- specific information from the resource booklet
- knowledge and insight you have gained from your studies in geography
- relevant original and/or effective visuals, such as maps, graphs, and diagrams.

Space for planning has been provided on pages 4, 10, and 16 to help you prepare your responses. The questions on page 3 are repeated on their respective planning pages.

QUESTION ONE

Critically analyse the change over time in extreme natural events globally, and justify what is the most significant factor(s) causing the change.

Use page 4 to plan your ideas, and begin your answer on page 5.

QUESTION TWO

Perspectives are bodies of thought, theories, or world views that shape people's values.

On a global scale, critically evaluate through perspectives who is the most impacted by extreme natural events, and justify who is responsible for mitigating the impacts.

Use page 10 to plan your ideas, and begin your answer on page 11.

QUESTION THREE

Discuss to what extent technological advancements could resolve the impact of extreme natural events across the globe.

Use page 16 to plan your ideas, and begin your answer on page 17.

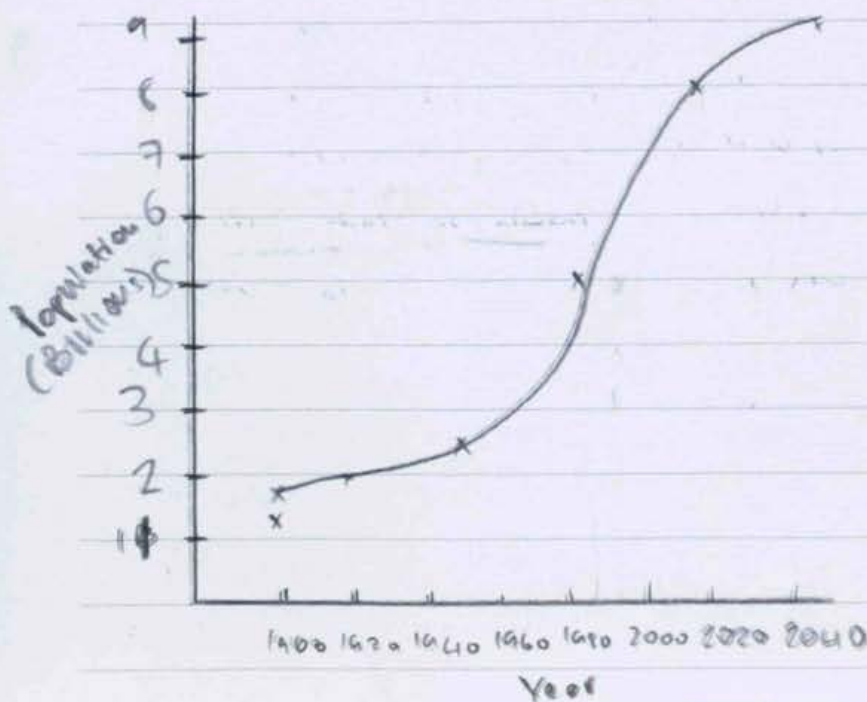
Begin your answer to **Question One** here:

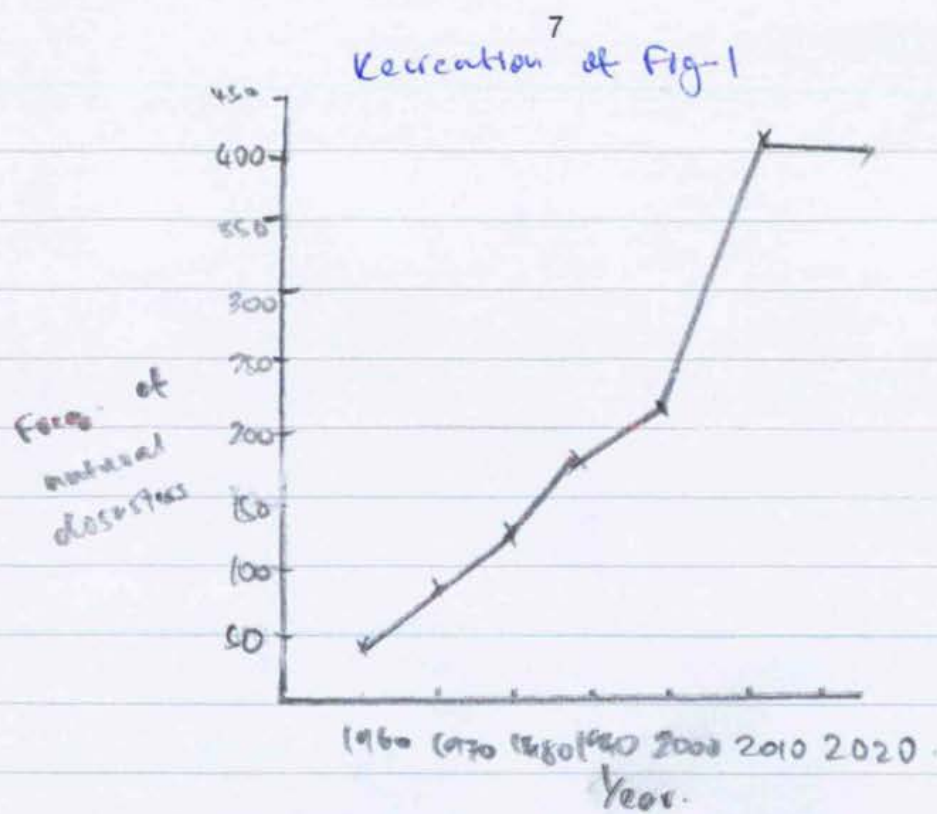
~~Global extreme~~ The trends in global extreme natural events have significantly changed ~~and those~~ in the last 50-90 years. ~~The Institute for Economics and Peace cited an increase in annual natural disasters from just 39~~
~~in the year 1960 to 396 in 2019.~~ These shifts in global trends can be highlighted in three key areas: frequency, ~~human vulnerability~~, human exposure, and death toll. There are a range of factors which contribute to these shifts, and their relative importance can be evaluated.

The predominant change in ~~the~~ global extreme natural events is frequency. The Institute for Economics and Peace cited an increase ~~from~~ in annual natural disasters from just 39 in the year 1960 to 396 in 2019. As seen in this data, the change in frequency has mainly taken place over the last 50-90 years. There are several ~~examples~~ at local examples of increased natural disasters, such as the increased economic impacts of storms in the U.S.A. since 1980. The economic cost of storms per decade has increased from \$216B in the 1980s to almost 1 trillion dollars in the 2010s, and just halfway into the 2020s, 70% of all natural disaster costs in 2010 have already been accumulated. Therefore, the increase in frequency of natural disasters is evident across the globe. Many debate the predominant cause of this increase in frequency,

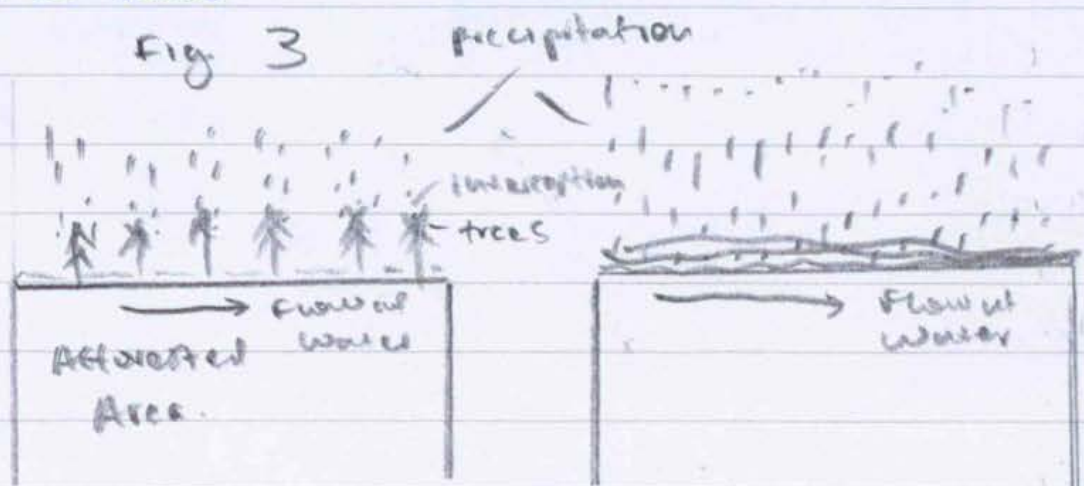
~~While some point to natural causes~~ however some points to the Earth's increase in temperature as a natural occurrence, similar to past events such as the end of glacial ice ages, and the evidence of crop growth in ~~cold areas~~ arid areas in the Northern United Kingdom in would suggest that the Earth has previously undergone significant warming. However, with all the recently collected scientific research, it is difficult to discount the human factor in Earth's climate change, which would identify human activity as the predominant cause behind the shift in frequency. This is evidenced initially by the Intergovernmental Panel on Climate Change's statements, asserting that global warming has been indisputably caused by human influence, this is backed up by correlations in the data in Figure 1 and Figure 5.

Recitation of Fig. 5





As seen in the two diagrams, there is a correlation between population growth and frequency of natural disasters, which would point to a link between human activity and the threat of natural disasters. This can be seen locally in Afghanistan, where deforestation has significantly exacerbated desertification and issues of floods.

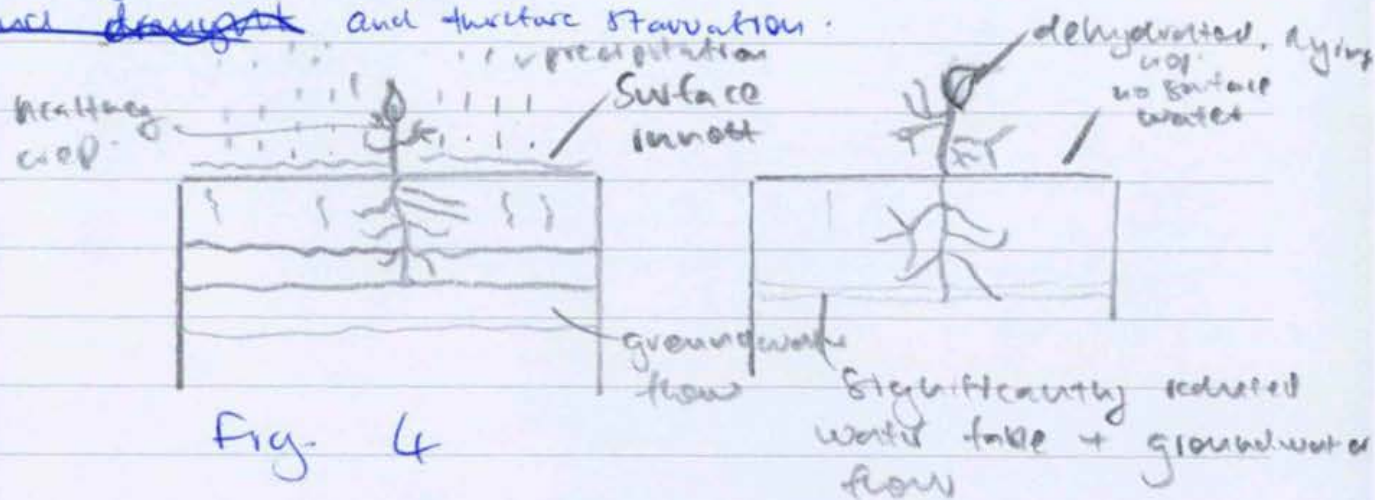


As seen in Fig 3, forest coverage can increase interception and slow surface runoff, both contributing to a decreased flood risk. This is another example

at the link between human activity and natural disaster frequency, as 12 million have been affected in Afghanistan by floods and droughts since 2012. Therefore, the link between human activity, global warming and the escalation of climate disasters points to human influence as the key driver behind increased frequency of natural disasters.

Another shift in trend has been the death toll at natural disasters. Deaths following disasters from flood and drought have significantly reduced since the early 20th century. While the 20th century often experienced ^{annual} natural disaster death tolls in the millions, today it is rare to see an annual death toll upwards of 20,000, with the most extreme years only reaching the hundreds of thousands. Thus, there has been a reduction in fatalities from natural disasters over time. This could be due to a number of reasons; firstly, natural disasters may have become less severe over time, however, there is almost no evidence to support this claim, as intensity and frequency has been proven to have increased, as evidenced in the multitude of disasters in 2023. National and international responses to disasters have improved, with globalisation allowing for an increase in international aid, and the increased availability of early warning systems. Such as those put in place in ^{countries} such as Indonesia.

for flooding mitigation. However, this increase in response may not be the primary cause of this shift. The reduction in famine ~~and a~~ globally can be seen to be the most significant factor in reducing natural disaster death toll. As seen in Figure two, floods droughts were by far the deadliest disasters at the 20th Century, primarily due to their causation of famine ~~and drought~~ and therefore starvation.



As seen in Fig 4, droughts lead to significantly lesser water sources for crops, leading to a removal of key food sources resulting in famine, this was the primary cause of fatalities in early 20th century floods and droughts. Since then, improvements in food security following increased globalisation and agricultural development have led to decreased impact of floods and droughts on food sources. Thus, food security has been the most significant factor in reducing natural disaster fatalities.

In conclusion, human activity and food security can be assessed to be the most important factors in the recent trends in global ~~natural disaster~~ ^{extreme natural} events.

Begin your answer to **Question Two** here:

By adopting three separate perspectives: economic, social/human, and global environmental, the relative impact on different populations can be ~~analysed~~ viewed through different perspectives. On a local level and an international level, it can be justified there are different levels of responsibility for different groups in terms of mitigating the impacts of ~~global~~ natural disasters.

Adopting an economic perspective, impacts are not predominantly viewed through death tolls or social impacts, but purely economic damages, as these will have knock-on effects throughout the wider area. Thus, through this perspective, measures such as the 'World Risk Index' are discounted, as they consider a country's ability to respond to natural disasters, which would bias against countries whose economies are much larger and therefore more vulnerable to economic damages. For instance, the Australian Bush fires of the 2019-2020 'black summer' possessed a relatively low death toll compared to its size at 17 million hectares of burnt land, however it caused a drastic economic disruption of ~~and~~ approximately AUD 82.8 billion. This would be assessed as not negatively impacted through a human perspective, however through an economic lens, this had a large impact on Australia. ~~Thus, through an economic perspective, those most impacted by natural disasters~~

~~Thus, through an economic perspective~~ Furthermore, South East Asian economies primarily focussed on agriculture experienced 60% of total annual average losses from all disasters only through drought. This evidence, alongside Australia's Bush fires, means that through an economic lens, those most affected by natural disasters are population's whose ~~an~~ economies are at risk from natural disasters.

Conversely, through a social / human perspective, economic loss is largely ignored, instead, the most affected can be assessed to be those areas with high risk of death and also a ~~for~~ ~~com~~ intangible impacts such as connection between land and culture. Areas on plate boundaries can be especially at risk of ~~fatal~~ high-fatalities disasters, such as earthquakes and volcanoes.

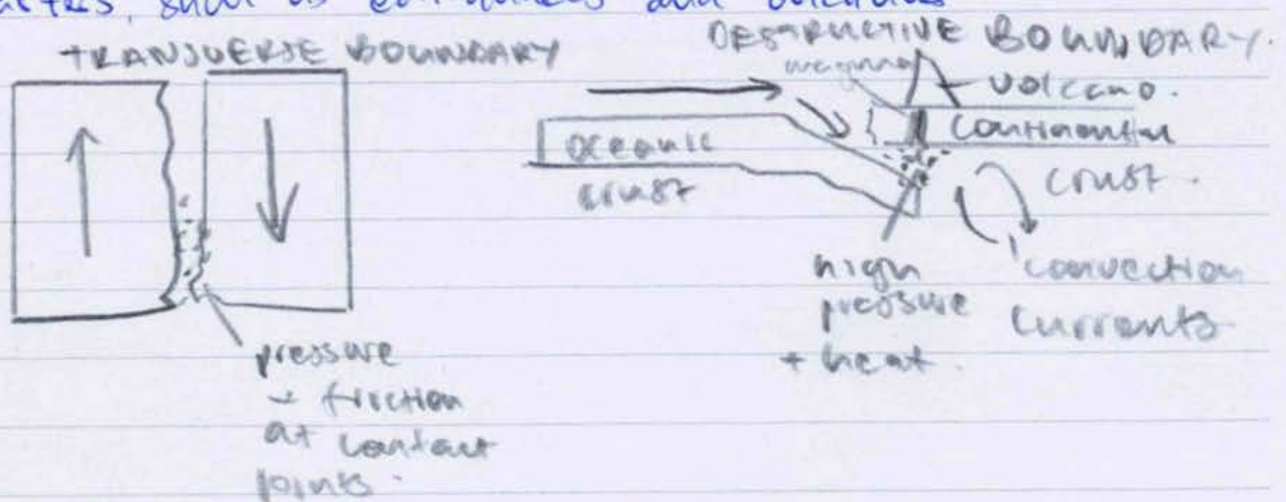


Fig. 1

As seen in Fig 1 above, different types of plate boundaries can contribute to fatal natural

disasters, putting countries ⁱⁿ ~~with~~ specific tectonic areas at higher risk. This can be seen in Vanuatu, which experiences volcanic and earthquake activity along with cyclones, which lead to a multitude of fatalities and injuries. Similarly Bangladesh, whose low-lying topography and funnel-shaped coastal inlets make it extremely prone to flooding through storm surges, and the 6th riskiest country to live in globally according to the World Risk Index. In Australia, the bush fires ~~lead to~~ ~~for~~ at 2019-2020 lead to another element of social focus which connected to intangible damages. The Aboriginal population experienced disproportional impacts during the event due to their connection with the bush environment and traditional practices. Therefore, it can be assessed through a social human perspective, that those at risk of high fatalities and intangible cultural damage are the most impacted by natural disasters.

A global environmental perspective takes a very different approach. Instead of placing different weights on different populations impacted by natural disasters, it places equal importance in all global impacts of natural disasters and their ~~not~~ ~~can~~ environmental impacts. Therefore, not one singular population is most impacted by natural disasters, rather, the global population are all equally impacted through natural disasters and their harm to the

environment.

In terms of responsibility of the mitigation of these impacts, it can be assessed that this varies between local and global mitigation.

Local impacts, such as economic damages, infrastructure damage, ~~death toll~~, fatalities and injuries should largely be mitigated through local authority. For instance, Australia initiated an in-depth review of disaster response systems and land management ~~these~~ practices at local and national level, in order to mitigate against future fires and repair the damage of the Black Summer event. However, Australia's ~~ability~~ ability to do this hinges on their status as an HIC, with strong government stability and funding. Smaller, lower-income countries, such as Vanuatu, might be less able to locally mitigate extreme economic and human damages. Therefore, there is a responsibility within the HICs of the world to contribute to foreign aid in order to assist these countries.

Global impacts, on the other hand, should be a joint global responsibility, as without a joint, cohesive world effort, the mitigation of natural disasters, especially those rooted in climate change, would be nearly impossible.

This is evidenced through the Sendai Framework and Paris agreement, both which target individual responsibilities of countries to contribute to a global effort to manage the impacts of climate change as well as the natural disasters it causes. Therefore, the global impacts of climate change and natural disasters are a ~~the~~ joint global responsibility.

In conclusion, three different lenses promote three separate interpretations of who is most impacted by natural disasters. However, the perspective with the most validity can be assessed to be the human/social perspective, as to truly preserve the global population, human endangerment must be prioritised. In the context of responsibility, global and local responsibility can be seen to be separate, as evidenced by Australia's response to the 'Black Summer' compared to broader frameworks, such as the Paris agreement and the Sendai Framework. However, this can be seen to have a responsibility to deliver foreign aid to countries who are less able to mitigate against the local impacts of foreign disasters.

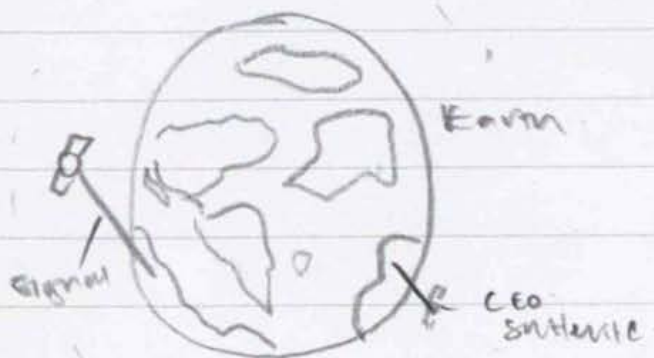
Begin your answer to **Question Three** here:

Technological advancements have been effective in mitigating the impacts of natural disasters, however they have not been implemented globally, and alternatives such as nature-based solutions as well as ~~environmental~~ global environmental intervention must also be considered.

Technological-based solutions have been implemented in different places across the globe and have been successful in mitigating the hazards of natural disasters.

~~For example~~ Technologies such as Cloud and AI, remote sensing and sensors and LEO Satellites have all improved global response to natural disasters through technological advancement. LEO satellites specifically have allowed internet access to previous dark zones.

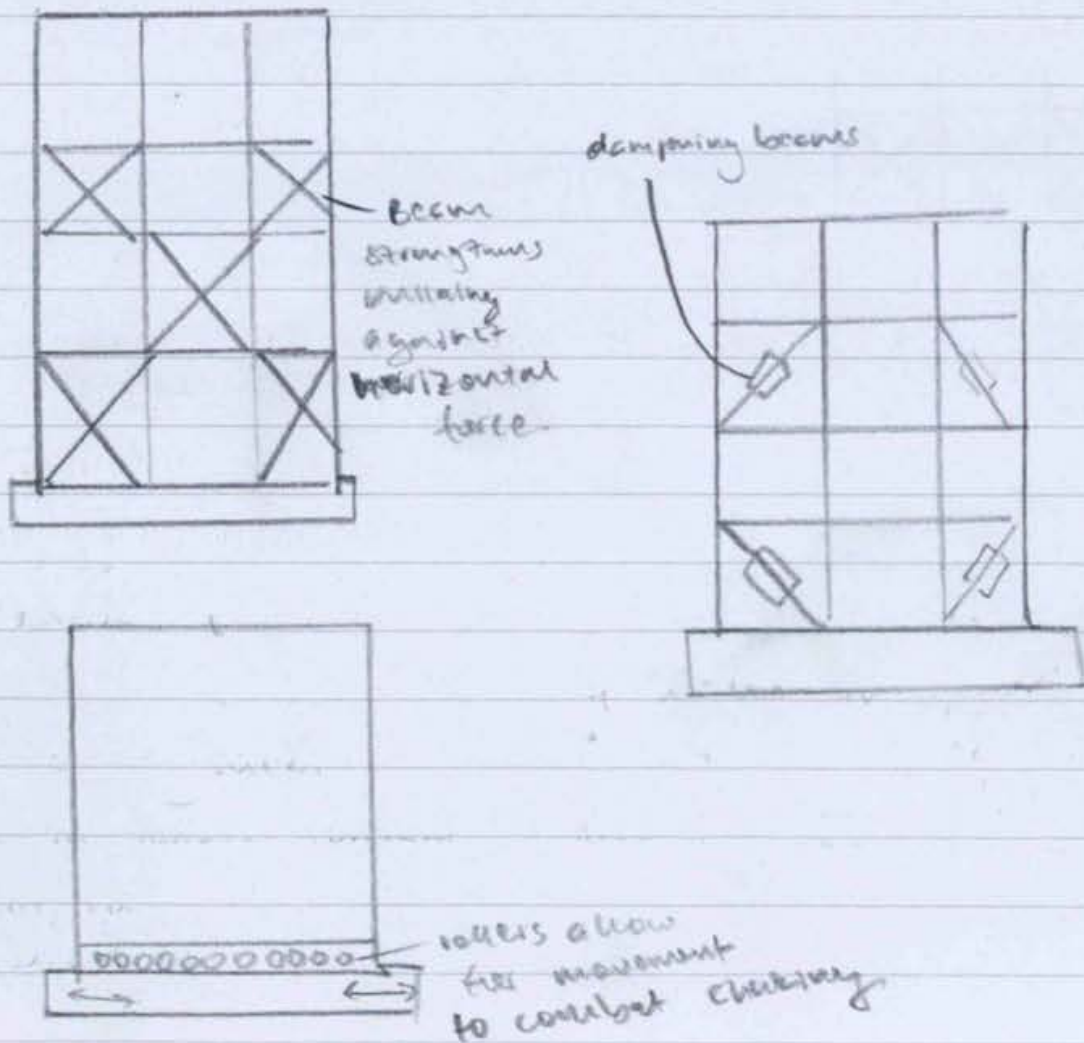
Fig. 1



As seen in Fig 1, this has the potential to allow for global access to internet and thus the improvement of

knowledge and education surrounding natural disasters. More ~~specifically~~ specific examples of technological advancements benefiting the mitigation of natural disasters include the ~~first~~ Early FEWEAS system in Indonesia. This is an internet-based application to predict and monitor rainfall ~~in~~ and flooding, and has been successful in mitigating flooding in the rivers of East and West Java. Similarly, building advancements, such as those in Japan, can allow for ^{the} reduced impact of earthquakes on buildings.

Recreation of Figure 20.



A combination of the proposed designs allows for safe building during earthquakes, and thus the mitigation of collapsing hazards. However, these technologically advanced interventions are costly, and primarily used in highly-populated HICs. Moreover, ~~the technology~~ is not the majority of this modernised technology is not available globally.

Therefore, the extent to which technological advancements can resolve the global impacts of extreme natural events is somewhat limited.

Alternatively, nature-based solutions should also be considered in the mitigation of extreme natural events. These methods can be cheaper, more accessible, similarly effective and ~~less~~ beneficial to natural ecosystems. Mangrove rehabilitation is a great example of how nature-based solutions can have multi-faceted benefits on the local environment.

Fig. 2

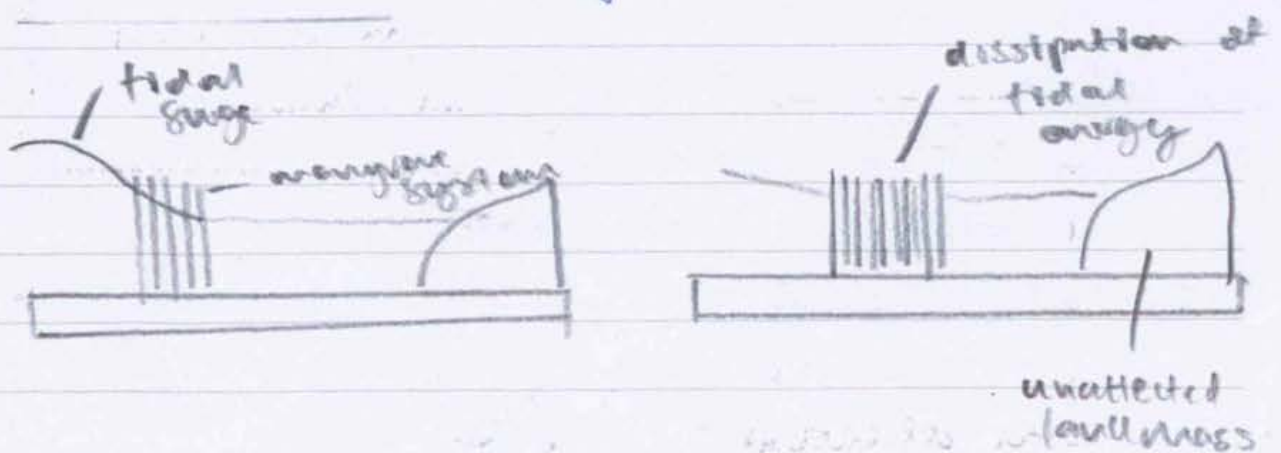


Fig. 2 depicts how mangroves help to disperse tidal energy in the event of a storm surge or flooding protecting the natural environment. This has been identified as an effective method of management for Indonesia, with the potential to protect 74 million coastal-dwellers and reduce local emissions by 16%, it has further benefits to the natural environment, such as improving water quality and providing a healthy habitat for fish and increased marine biodiversity.

Therefore, nature-based solutions can have multi-faceted benefits to natural environments while simultaneously mitigating against extreme natural events. However, while these solutions do somewhat address the global issue of climate change, they are not suitable for all forms of natural disasters, and thus are also somewhat limited in their ability to resolve global impacts of extreme natural events.

Environmental intervention is the key to global mitigation of extreme natural events. As discussed by the Intergovernmental Panel on Climate Change, "warming has been indisputably caused by human influence" and this 1.0°C rise in surface temperature since the 1850s has drastically influenced the frequency and intensity of global extreme natural events. It is thus a result of these effects

Which will be most impactful in mitigating global impacts. Joint global efforts to reduce greenhouse gas emissions, such as the Paris Agreement, will assist in reducing the enhanced greenhouse effect which traps heat and contributes to the rises in global temperature which underlie the increased presence of extreme natural events. Reducing emissions and other destructive activity such as oil extraction, deforestation and mining is key to protecting the global environment, and thus mitigating against the global impacts of extreme natural events.

Therefore, technological-based and nature-based management, while effective in its mitigation of local areas, are somewhat limited in ~~their~~ resolving global impacts of extreme natural events. It is therefore a combination of these two strategies, alongside environmental intervention to combat climate change that will be most effective in reducing the impact of extreme natural events across the globe.

Scholarship

Subject: Geography

Standard: 93401

Total score: 17

Q	Score	Marker commentary
1	06	The response provides a clear and perceptive analysis of temporal change, demonstrating strong critical engagement with both the nature of the shift and its underlying causes. There is effective synthesis of a wide range of supporting evidence, and the integration of visual material meaningfully enhances the argument rather than simply illustrating it.
2	06	This response shows a high level of critical evaluation, drawing on multiple perspectives to address the complexity of who is impacted and who holds responsibility. Evidence is purposefully selected and well integrated, and the visuals are used analytically rather than descriptively. The argument is communicated with clarity and control.
3	05	While not as consistently strong as the first two responses, this response still demonstrates clarity of thinking in evaluating the extent to which technological solutions may mitigate impacts. Critical awareness is shown by discussing both the limitations of technology and the necessity of broader, multi layered approaches. The line of reasoning is logically developed.