United Nations Office on Space Affairs

Sebastián Ávila Cabal & Gabriela Klinger Alvarado

2024

COMMITTEE GUIDE

UNOOSA

CCBMUN XXII

Contents

1. Presidents' Letter

Dear Delegates,

We would like to give you a warm welcome to the UNOOSA (United Nations Office for Outer Space Affairs) at CCBMUN. Primarily, we will introduce ourselves as your chair: Sebastián Ávila Cabal, and Gabriela Klinger Alvarado from Gimnasio la Colina. We can proudly say that we have been part of the MUN for several years, fulfilling the role of delegates and presidents. During these past months, we have worked extremely hard to prepare a committee in which every member will be able to play a crucial part and to deliver an exceptional performance so that you have a challenging and interesting experience.

This year, we decided to be presidents of the United Nations Office for Outer Space Affairs (UNOOSA), because we believe that this model is an opportunity for all of you to be aware of the current situations of outer space. In addition, we believe that activities like this strengthen social and critical thinking and are a unique opportunity to learn about the current issues affecting society, whilst obtaining skills that will serve you in your academic and personal lives. We want this model to be an unforgettable experience, in which you can learn about the different characteristics of your delegation, the worrying situation of Outer Space problems, and the solutions that can be found. We have chosen these topics so that you will not only be informed and discuss current problems, but you will also become aware of the great changes that must be generated today in order to safeguard humanity's future. We want you, at the end of these days of debate, not only to develop a passion for the Model UN, but to develop a genuine interest in transforming your environment.

We understand that this may be your first UN model so we want to encourage you to approach us if you have any questions and need help with any of the preparation. We also want you to feel confident and to trust your skills and abilities. We also had our first model, and we know it is not easy, which is why we will do everything we can to help you, both with your portfolios and when debating. Remember that if you have any questions you can write to us at the committee's email (unoosa@ccbcali.edu.co) so that we can help you. We have high expectations for this model, and we are confident that they will be met.

Yours sincerely,
Sebastián Ávila Cabal and Gabriela Klinger Alvarado
Presidents of UNOOSA

Topic 1: *Regulation of Space Tourism*

I. History/Context

Whilst space exploration goes back to the past century, with the launching of the first artificial satellite in 1957 to the moon landing in 1969, the beginning of space tourism is marked by Dennis Tito's trip to outer space on April 28, 2001. He negotiated with Russia for 10 years and finally paid USD $20M to accompany Russian astronauts to the International Space Station on a supply mission. Space tourism can be defined as recreational space travel on established government owned vehicles or vehicles fielded by private companies. Since that time, various space tourists have paid to go beyond the Earth's atmosphere, with Virgin Galactic recently completing its fourth sub-orbital space flight for tourists.

Suborbital space tourism: the rockets do not go very high or fast and will not complete an orbit around the Earth. Passengers will see the Earth from afar and will experience a few minutes of weightlessness. The rockets usually reach a height of 100 km above the ground, and the flight usually lasts up to a few hours. This is the most common form of space tourism at present.

Orbital spaceflight: spacecraft orbit around a star, planet, or moon. Passengers may spend up to a week orbiting the Earth. This market is expected to grow in the future.

A New Frontier

77 countries have their own space programmes, but not all of them cover space tourism, which is often developed by private companies. Some of these private companies include Blue Origin, SpaceX, Virgin Galactic, Boeing, Axiom Space, Space Adventures, Sierra Nevada Corporation, Zero 2 Infinity, Bigelow Aerospace, Northrop Grumman, Orbital Sciences Corporation, Rocket Lab, World View

Enterprises, Armadillo Aerospace, Orion Span, Space Tourism, United Launch Alliance and Origin Space.

As space tourism is a relatively new industry, companies say that they are on the bridge of technological development and innovation, therefore they cannot be stopped with regulations. For these reasons, in 2004, a phase called the learning period was implemented, during this time companies involved in space tourism could have the freedom to explore without having regulations. The learning period has now been extended more than four times, and questions are being asked in the USA about whether it is time for the FFA (the Federal Aviation Administration) to begin controlling space tourism and start protecting individuals planning on going to outer space. For this reason, the FFA came up with a 25-member committee named the Human Space Flight Occupant Safety Aerospace Rulemaking Committee.

Currently, there are multiple problems that have arisen from space tourism since it needs to be regulated. However, the companies that are getting involved in space tourism have a lack of knowledge on the appropriate regulations needed to make sure it is safe. They justify this lack of knowledge by comparing space tourism to aviation and stating that when aviation and commercial flights first started to take place there were no regulations; these started developing over time. However, there need to be laws established that protect individuals being sent into space. Presently, only lift-off and entry are being protected, but they don't guarantee the safety of those individuals in the spacecraft; the laws only protect individuals on the

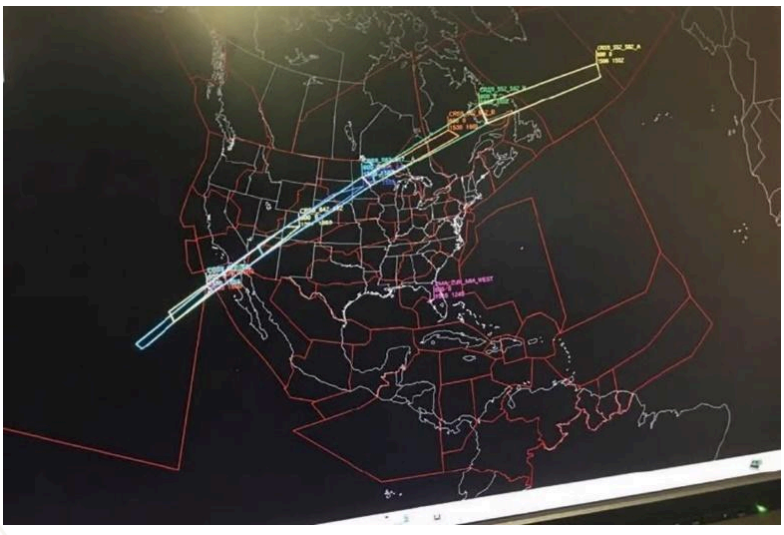

Figure 1: FAA. (2021). The Space Data Integrator tracks commercial space launches and reentries].

ground from falling debris. Crew members of the spacecraft, and individuals who plan on making the trip to outer space, need to sign a waiver that recognises the risk of going to outer space.

The Federal Aviation Administration (FAA) plays a crucial role in the United States, establishing safety standards and licensing procedures for commercial spaceflight. They constantly have to balance the risk of disaster with the need to allow for innovation.

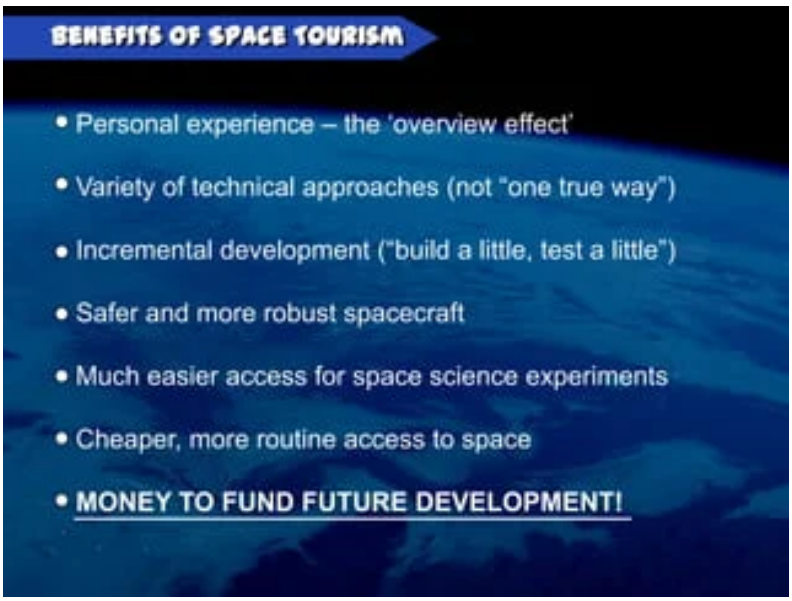

Figure 2: Evangelist. (2013). Space Tourism Benefits

Supporters of space tourism say it has multiple positive impacts that can help support the world economy. These are three advantages of space tourism:

- Boosting scientific research. Currently companies that are already part of the market of space tourism and companies that are interested in space tourism have started searching for ways to reach space in a more cost-effective way. New space technologies and methods to manage the space tourism industry generate new developments which may also benefit world development as a whole. They will also be important for

development in other sectors of the space industry, helping the world's economy.

- Rising public awareness of space science. Space is becoming more accessible every day and this is due to the current investment being made in the space industry. Public awareness of the importance of outer space is rising, and people are becoming aware that access to space should be equitable.
- Advancing spacecraft innovation. Companies are searching for efficiency in the space tourism industry. This implies that there will be faster and better ways to reach space because of constant development across multiple companies. In the future, it will be easier for people to reach space for different reasons, such as carrying out scientific research in space.

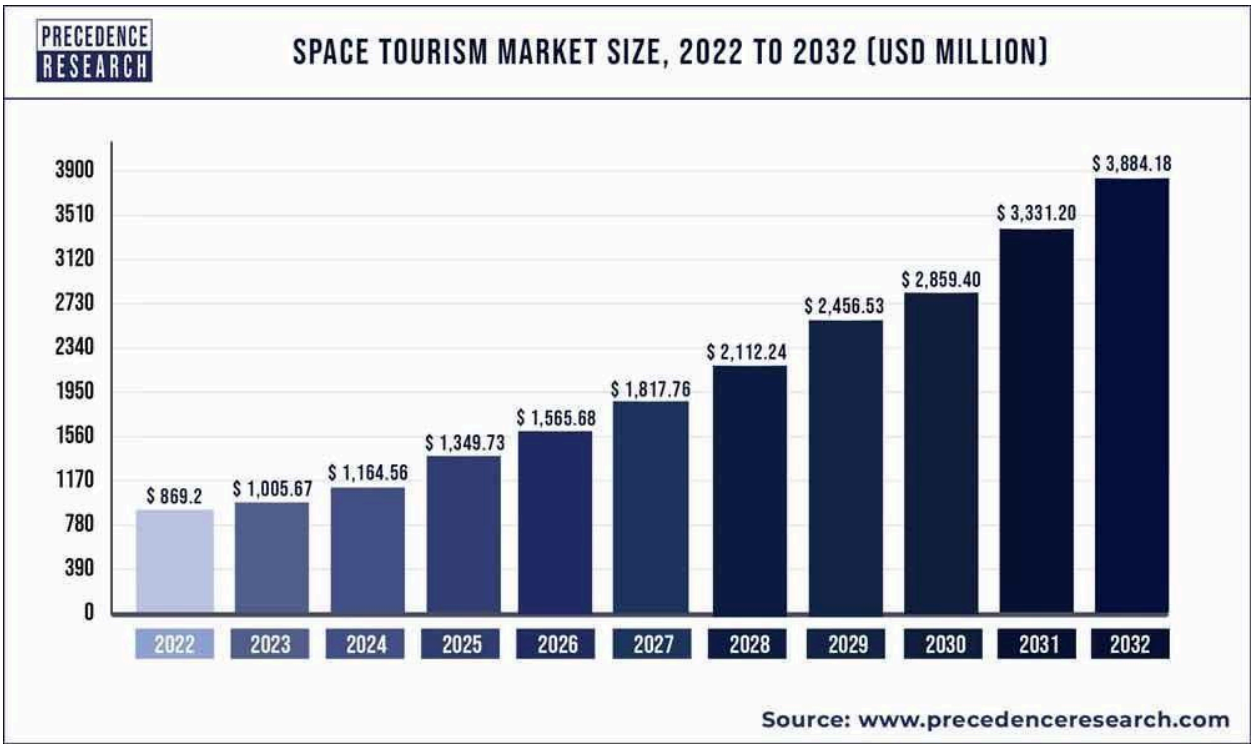

Figure 3: Projected market size for space tourism

International cooperation between countries is essential to harmonise regulations across borders and to ensure seamless operations for space tourism. There is a need to start discussions about space tourism between nations as some countries, including the United States, have been developing space programmes on a large scale for several years. As of 2023, only 77 countries in the world had access to space programmes, which means that, with space tourism development, countries that do not have sufficient monetary resources to develop space programmes are at an even greater disadvantage. A higher demand for aerospace activity could also mean that countries start a space tourism race, which could harm their relationships and affect the development of outer space activities in the near future.

II. Current Situation

Currently, the space market is worth over USD 400 billion (World Economic Forum, 2024), and the industry is constantly expanding, as more private companies start to invest in space activities. According to Forbes, (2021), there are: more than 10,000 space-focused companies globally; 5,000 significant investors; 150 research and development hubs; 130 governmental organisations; and 30 business sectors, from navigation and mapping to space medicine. Space is now one of the newest sectors of the economy, but there's no specific regulation on how the space industry is supposed to address space tourism.

Figure 4: Fox News. (2022). Nearly half of Americans want space travel.

Another concern regarding space tourism nowadays is the rise in space junk due to human activity. There is already a huge problem with the amount of junk flying around in outer space from satellites and rockets, and space tourism will only increase the problem. Additionally, the spacecraft necessary for both suborbital and orbital space travel for space tourism cause excessive emissions such as black carbon, just like any other rockets that are sent into space. Black carbon is the fine soot or dark matter that is released from vehicles, most commonly from cars. It can also be released from space rockets, causing problems for individuals and for the environment, as it can provoke lung disease, infiltrate the atmosphere and the ozone layer, and harm ecosystems. Therefore, space tourism not only poses a security issue for humans, it also contributes to outer space contamination.

Recently it has been proven that space tourism is potentially worse for the environment than air travel, because rocket launches and the spacecraft that will be used for space tourism emit black carbon directly into the stratosphere. At present, there is a higher level of air travel than space tourism, but if the demand for space tourism increases over the years, it will pose a bigger threat of contamination than air travel, and it will rapidly pollute the atmosphere. Addressing these environmental concerns requires the adoption of sustainable practices, such as developing eco-friendly propulsion systems and implementing debris reduction strategies to reduce the negative impacts on the environment that space tourism poses.

For this reason, as stated by the Space Generation Advisory Council, astronauts train for years to go to outer space while space tourists are barely prepared and in most cases they go to space for entertainment. With space flight becoming more accessible and people with minimal training being able to access space, there is the need to raise the question of whether the world is prepared for a large space tourism economy and, most importantly, is the world ready from a safety and sustainable standpoint.

UNOOSA holds a liability convention where the harm done to potential passengers is not discussed, and there is only a focus on objects in outer space or on the ground. The US Federal Aviation Administration explicitly warns that they have not certified any launch and reentry vehicle for carrying people, except SpaceX's Dragon 2 capsule. That is not to say no attention is paid to it. The only deadly crash in commercial space flight testing, involving test pilot Michael Alsbury flying Virgin Galactic's SpaceShipTwo, has been thoroughly investigated by US safety bureaus. The accident was deemed a human error and a set of safety recommendations was made to avoid similar problems in the future. In the end, companies themselves are responsible for safety, but if space tourism is not regulated, people's lives may be at risk as a result of physical dangers to the people who travel, and environmental dangers for those who live near launch sites.

There is also a need to implement regulations to avoid contamination of outer space. These regulations include developing greener rocket launches. In order to do this, the space industry should seek to develop a cleaner source of energy to develop more sustainable rocket fuel that could include biofuels (a fuel derived immediately from living matter) that would avoid hefty amounts of black carbon from entering the atmosphere.

Some of the companies involved in space tourism are continuously refining their technology to enhance reliability and reduce costs of space travel, thereby making it more accessible to the masses. SpaceX's reusable rocket technology, for example, has significantly lowered launch costs, laying the groundwork for more affordable space tourism experiences. At the moment one trip can cost up to USD 1 million (Queen City News, 2023), so it is unlikely that space tourism will become a regular event for most people in their lifetime. However, if regulations are not put into place now, the effects of unregulated space tourism in the future may be catastrophic.

Controlling space tourism

Space tourism must be controlled and carried out with proper regulations if it is to achieve success as a new industry. There is also a need for transparency and international treaties in order to prevent an arms race, and to protect both our planet and other places in outer space. It is essential to produce an inclusive framework for space governance that ensures all nations have a voice in shaping regulations and policies related to space tourism, not just the ones that currently have the technology to be able to offer this type of experience.

Through the years different regulations have been implemented to protect outer space that include regulations such as the ones being taken by The United States Federal Aviation Administration (FAA) that has taken a leading role in regulating commercial spaceflight activities through its Office of Commercial Space Transportation (AST). AST oversees the licensing and permitting process for commercial space launch and reentry operations, assessing the safety and risk factors associated with each mission. Companies looking to conduct space tourism flights must obtain a launch licence from the FAA.

However, even before the FFA started implementing this regulation, the Outer Space Treaty was established in 1967. It states that outer space should be free for exploration and use by all nations, but it does not offer direct regulations for commercial activities and space tourism. In 1971 and 1976 two regulations were implemented, the Liability Convention and the Registration Convention, that are treaties which outline liability for damages caused by space objects. These treaties require states to register their space objects.

Nonetheless, these regulations lack comprehensive environmental regulations concerning space tourism, and they do not consider risks such as Radiation Risks. Radiation Risks have become a concern because radiation exposure can be dangerous for space tourists, more so if commercial spaceflight takes place during solar events. Regulations do not sufficiently address these risks, and there is a call

for more adequate guidelines to protect passengers from high radiation levels during flights. This is concerning due to the fact that the commercial spaceflight industry is rapidly increasing whilst regulations to deal with problems that arise from space tourism are not advancing at the same pace.

To conclude, space tourism is an exciting innovation with great potential for the future of humankind. However, it may cause multiple problems in the future if it is not regulated. There is an urgent need for countries to come together and cooperate at an international level to implement laws which will prevent space tourism from harming individuals, having a negative impact on the environment, or affecting countries' relationships regarding space affairs.

III. Key points of the debate

- The innovation that has been made by private companies, focused on space tourism, and their repercussions on the world economy
- The lack of knowledge companies that are exploring space tourism have towards protecting the safety of space tourists
- The lack of control over the businesses that are investing in space tourism
- The problem of controlling private companies which are functioning in outer space
- The negative effects space tourism poses for the environment on Earth and in outer space
- Inequalities between countries that arise as a result of space tourism
- The need to implement international laws and regulations to control space tourism
- The need to ensure that advances in space tourism are beneficial for all countries

IV. Guiding questions

1. Does your country currently have any space tourism programmes or companies, and how are these entities regulated by the government?
2. What specific international agreements or frameworks to do with outer space has your country supported or ratified?
3. What safety standards and protocols should be established for space tourism operators to ensure the safety of passengers and crew?
4. What environmental effects would an increase in space tourism have on your country? What measures need to be taken to ensure that space tourism does not have negative impacts on the environment?
5. What measures should be proposed to ensure that the economic benefits of space tourism are shared equitably among nations, and how does your delegation (if it's the case) plan to include developing countries in these benefits?
6. Does your country have its own specific laws about what can be done in outer space? How does the Outer Space treaty need to be changed to cover space tourism in particular?

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Figure 1: US FAA expands air traffic control to include commercial space tourism. (2021, July 22). New Atlas. https://newatlas.com/space/us-faa-air-traffic-control-space-tourism/

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Topic 2: *Access to space technology for disaster-prone regions*

I. History/Context

The foundations of space technology date back to the 9th century, when the Chinese developed the first known rocket. Rockets were developed in different countries over the centuries for purposes of warfare, but it was the German V2 rocket technology in WW2 that facilitated the possibility of launching rockets into space. In 1957, the Soviets launched the first artificial satellite, Sputnik 1, into space, and four years later the Russian Lieutenant, Yuri Gagarin, became the first human to orbit Earth in Vostok 1.

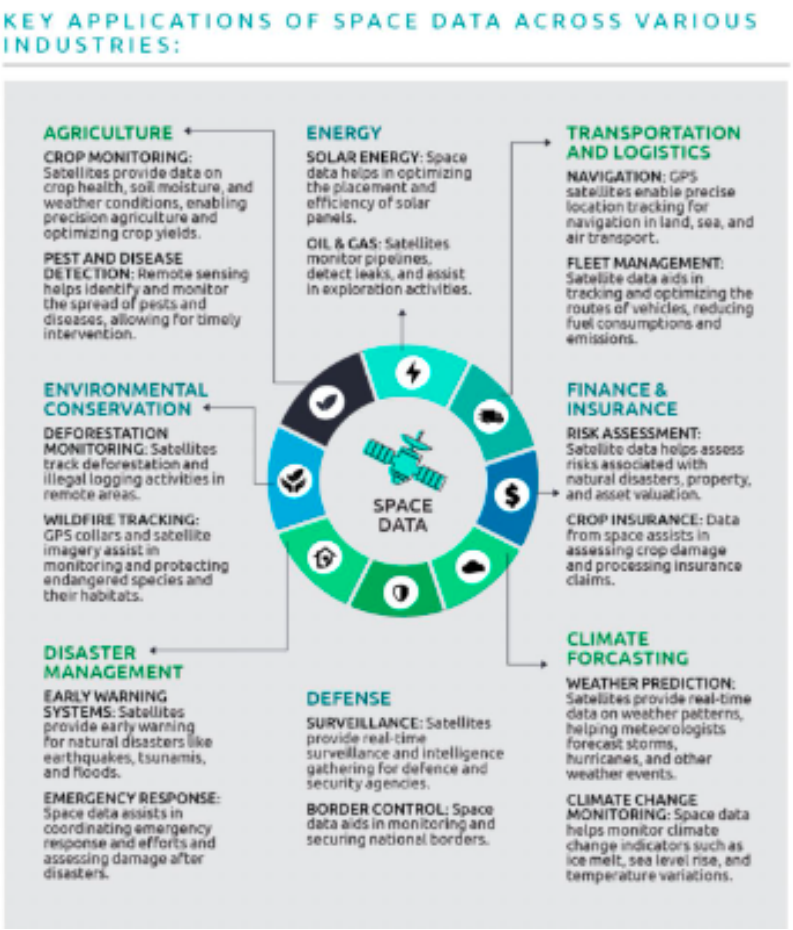

Figure 1: SRON. (n.d.). Space Data across industries

Gradually more and more countries started developing their own space technology. Satellites are now used by all countries for many different purposes such as weather prediction, mapping and communication. One of the areas in which satellites are very useful is in the control and prevention of natural disasters. However, not all nations had the necessary resources to implement this technology, affecting their development rate.

According to the Cambridge online dictionary, a natural disaster is "an event caused by nature that kills people or causes damage" Earthquakes and hurricanes are examples of natural disasters. (Cambridge University Press, 2024)

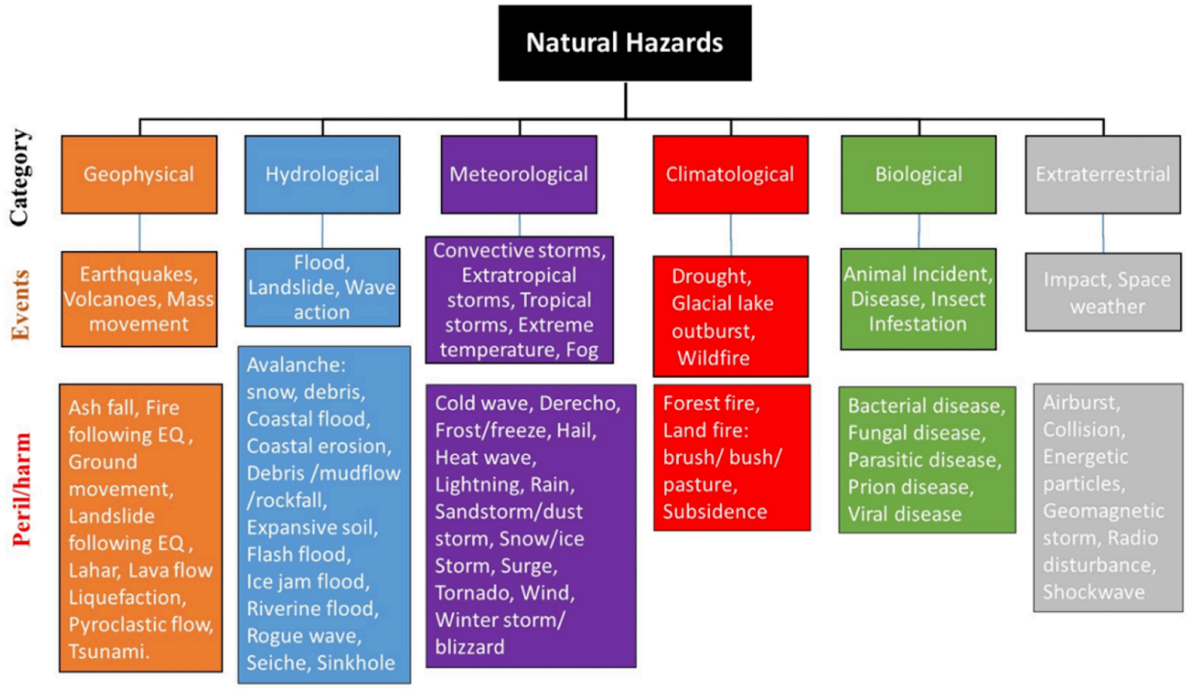

Figure 2: Classification of Natural Hazards

The Resolution of the United Nations General Assembly proclaimed the period between 1990 and 1999 as the International Decade for Natural Disaster Reduction. It called for a concerted worldwide effort to use existing scientific and

technical knowledge to implement public policy for disaster prevention, adding new knowledge as needed.

For this reason, the United Nations (UN) invented an International Strategy for Disaster Reduction that provides a framework for each country to fully utilise existing knowledge on the lithosphere, atmosphere, and biosphere and the information on disaster protection gained through several years of investigation, and to build effectively and creatively upon past accomplishments to meet the projected needs for safer communities.

According to the Planetary Health Alliance (n.d.), the main causes of natural disasters are tectonic shifts, lunar activities, deforestation, soil erosion, air pressure, ocean currents, pollution, global warming, mining, seismic waves, agricultural practices, mining and deforestation. According to Reliefweb, in 2023 there were 399 registered natural disasters which caused more than 86,000 deaths and affected over 93 million people around the world. The economic losses amounted to US$202.7 billion. (2023 Disasters in Numbers - World | ReliefWeb, 2024).

Satellites can be used to prepare for or to prevent natural disasters affecting countries in massive ways. Nevertheless, due to the lack of monetary resources in some disaster-prone countries, this technology is not always available. Nations with access to economic resources have the possibility to do better planning in prevention of and preparedness for natural disasters.

II. Current Situation

When a natural disaster occurs, it is critical to move people to safety before it occurs or to get them help as quickly as possible after the event. Countries such as Japan and the Philippines have used space technology to help in disaster areas and to prevent catastrophes. In Japan, there is a disaster management system

adopted by the national and local governments across Japan, giving authorities instant access to satellite data. In the Philippines, weather monitoring allows citizens to prepare for typhoons, whilst in Greece satellites have been used to monitor and control wildfires.

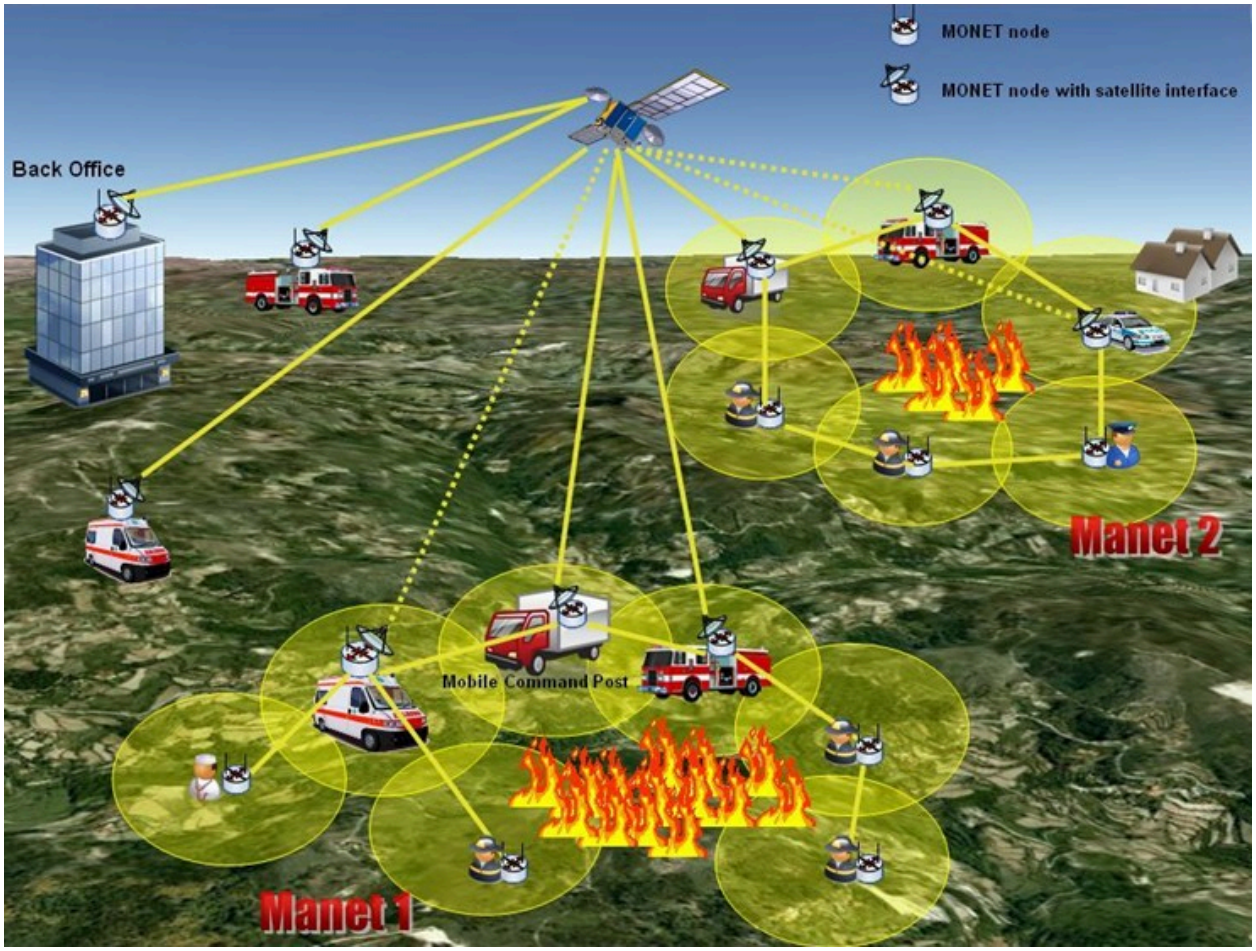

Figure 3: (Kumar, 2016) Disaster relief using satellites

Nations with more economic resources have a higher probability of spending their GDP on disaster preparedness to protect lives and infrastructure. Countries with greater access to expendable assets have more to invest in disaster preparedness. In the event of natural disasters, satellites are indispensable for effective communication and coordination. They enable first responders to access their location systems, transmit surveillance data, and send commands to rescue

teams, which is critical for swift and effective disaster response. Consequently, nations that do not have access to this kind of communication and monitoring technology will be worse off when natural disasters occur.

Figure 4: (Disasters: How Earth Observation Satellites Help Guide Emergency Workers, 2023)

Satellites not only provide help for disaster relief, they are also essential for monitoring environmental changes. They help scientists understand and track the changes in the atmosphere and processes on the ground such as desertification. This information is crucial for addressing changes that humans make on landscapes that may have serious consequences in the future. Thus, the role of satellites extends beyond immediate disaster response to include long-term environmental monitoring and management.

Developing countries do not always have access to satellite countries, and they rely on more developed countries to help them monitor the natural events that might happen. Small island countries such as Haiti and land-locked countries such as the Central African Republic have few resources to build up their own monitoring systems. Disasters in recent years had more serious effects due to the lack of satellite technology. For example, there were severe floods in Sudan in 2020 partly because the government did not have access to up-to-the-minute satellite data, meaning that they did not give evacuation warnings in time. In the

2019 earthquakes in Albania, there was no advanced ground to satellite monitoring systems so that communities were not prepared for the risk of an earthquake. In order to have good systems to prevent and manage natural disasters, it is important that countries have access to satellites and monitoring equipment on the ground. They also need a good level of infrastructure to ensure that information can reach communities quickly in the event of an emergency.

UN-Spider (United Nations Platform for Space-based Information for Disaster Management and Emergency Response) was established in 2006 in order to come up with solutions to fight the limited access that some countries have to satellite technology for disaster management. Other initiatives such as the European Union´s Copernicus Emergency Management Service (EMS) and NASA's SERVIR Programme have similar goals.

III. Key points of the debate

- The need for space-based early warning systems to predict and mitigate the impacts of natural disasters
- The deployment of satellite technology to monitor disasters in real time, enabling prompt and effective response efforts
- The international funding mechanisms or subsidies to make space technology more affordable for disaster-prone regions
- The effectiveness of cooperation between international space agencies and disaster-prone regions to share satellite data and technology
- The financial and technical support from international organisations like UN-SPIDER to enable access to space technology
- The possibility that heavy reliance on external satellite data and technology might undermine the development of local expertise and capacities in disaster management.

IV. Guiding questions

1. Does your country have disaster-prone regions that could benefit from access to space technology? What type of natural disasters does it suffer from?
2. What type of space technology is currently available in your country to monitor and prevent loss of life in disasters, if any?
3. Should space technology be accessible to all countries that have disaster-prone regions, regardless of who owns the technology? If so, who should bear the cost of this technology?
4. Has your country made use of the services for UN-SPIDER? If so, in what situations?
5. What needs to be done to ensure that all countries have equal access to space technology for disaster prevention?

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