Massachusetts Institute of Technology

Model United Nations Conference

Background Guide

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Letter from the Secretary General

Dear Delegates,

I am very excited to welcome you to Massachusetts Institute of Technology's 17th annual Model United Nations Conference - MITMUNC XVII! After months of planning, training and organizing, we hope this conference will be a new, challenging, and enriching experience for you.

With all the difficulties the world has experienced last year and is currently still experiencing, we still look forward to a brighter future. Building a sustainable future requires a lot of collaboration and effort and we are all hopeful to see that from you, the leaders of tomorrow.

This year, we decided to focus on technology and its impact on our societies and the whole world to test the pros and cons of technological advancement. Tech diplomacy is an important theme that defines MITMUNC XVII, especially with the prevalence of Artificial Intelligence. Technological advancements have paved the way for great and helpful solutions, yet they also opened up space for tech-abuse, which really makes us think, where are we heading? What's next? Dialogue, international relations and collaborations create the backbone of tech diplomacy and we are all looking forward to see your creativity spark during the conference to help implement tech diplomacy around the world, and fight technology-abuse that harms the international community.

Having experienced MITMUNC as a chair, then as a Secretary General, I am humbled and thrilled to guide MITMUNC into its best conference yet. Do not hesitate in contacting me or the secretariat team should you encounter any doubts along the way. I wish you the best of luck!

Sincerely,

Your Secretary General, Jad Abou Ali

For further inquiries, do not hesitate to contact us at sg-mitmunc@mit.edu.

MITMUNC XVII 2025

Letter from the Chairs

Dear Delegates,

Welcome to the 17th MIT Model United Nations Conference and the Economic and Social Council Committee! We're your chairs, Haylea and Andrew, and we have prepared two unique topics for you to address during the conference.

I'm Haylea, a sophomore from Kentucky studying Civil & Environmental Engineering with a minor in Political Science. This will be my second year as a MITMUNC chair, and I was involved in my state's Model UN during high school- on a topic about fighting desertification! I'm very passionate about anything related to sustainability, especially in connection with policy and international affairs. I'm so excited to be one of your chairs and see what you all can do with these topics!

I'm Andrew, a freshman, also from Kentucky, studying Physics and Mathematics with a minor in Astronomy. This is my first year as a MITMUNC chair, but I tagged along with Haylea defending against dreadful desertification back in the good ole days of high school. Tell me anything about education policy, space stuff, or about Stephen Wardell Curry on the side, or more importantly, tell me your passions about the environment and sustainability. I am thrilled to see Model UN from the other side, and I can't wait to hear all about your opinions and policies!

We are both looking forward to working with you all! The topics for this committee are about fighting desertification, especially in agricultural areas, and about sustainably meeting the growing demand for lithium and other critical minerals. We hope each one will allow you to learn–both from and with each other–and to engage critical thinking skills to propose solutions to these complex issues.

We look forward to seeing you in February and wish you luck as you begin preparations!

Sincerely,

Your Chairs: Haylea Brock & Andrew Pham

For further inquiries, do not hesitate to contact us at unea-25@mit.edu.

MITMUNC XVII 2025

Committee Introduction

The United Nations Environment Assembly (UNEA) is the United Nations' decision-making body for addressing environmental protection and sustainability, bringing together representatives from member states, international organizations, and businesses. Established in 2012 as part of the United Nations Environment Programme—or UNEP—UNEA serves as the world's foremost decision-making body on environmental issues (UNEP). It focuses on a broad range of critical issues, including climate change, biodiversity loss, pollution, and the sustainable use of natural resources, as well as addressing global environmental challenges. UNEA provides a platform to discuss and adopt resolutions aimed at advancing sustainability and environmental protection; during meetings, they evaluate progress and develop strategies to address environmental concerns. Through these efforts, UNEA works to promote global cooperation and actionable solutions to safeguard the planet's ecosystems; the issues that it addresses have far-reaching implications, demanding comprehensive and cooperative solutions to safeguard ecosystems and ensure a sustainable future

UNEA convenes biennially to discuss, evaluate, and adopt resolutions aimed at tackling pressing environmental problems. The Assembly's resolutions often influence international law, policies, and practices, providing a framework for member states to align their environmental initiatives. Since its creation, UNEA has solidified its role in fostering global cooperation to address challenges such as rising greenhouse gas emissions, deforestation, and plastic pollution.

As UNEA continues to shape international environmental policy, its work underscores the urgency of collective action. Climate change and environmental disasters are becoming steadily more pressing, especially in underdeveloped nations, so UNEA's role in promoting dialogue and ensuring that no country is left behind is indispensable. By fostering partnerships and developing actionable strategies, UNEA embodies the United Nations' commitment to achieving a balance between economic growth and environmental conservation.

Topic A: Desertification and its Effects on Key Agricultural Areas

I. Introduction

Land desertification is the severe degradation of land, often to a point where it can no longer hold water or adequately sustain life. This occurs as a result of factors like climate change, deforestation, and unsustainable agricultural practices. Desertification is common in areas where there is intense agriculture, which sometimes requires overirrigation of the soil and the use of harsh chemicals in pesticides and fertilizers. Because of this, in regions where desertification is rampant, food and water security are directly threatened; reduced crop yields and diminished water supplies create a cycle of poverty and hunger.

As the global population grows, the demand for food and water is projected to increase, further intensifying the pressures on agricultural systems already suffering from desertification. In many parts of the world, desertification has contributed to the migration of millions of people seeking arable land and access to fresh water, which in turn can spark regional conflicts over scarce resources. We have already altered 70 percent of all ice-free land, affecting over 3.2 billion people; At current rates, 90 percent of land will bear our imprint by 2050 (UNCCD). As this becomes less viable for agriculture, we face increasing food insecurity and reliance on already stressed water sources.

The United Nations Environmental Assembly (UNEA) recognizes desertification as a significant barrier to achieving sustainable development goals, particularly those related to food security, water access, and climate resilience. UNEA has emphasized the need for integrated policies that address both the prevention and restoration of degraded land, advocating for sustainable farming techniques, habitat protection programs, and efficient water management strategies. This background guide seeks to provide delegates with a deeper understanding of the multifaceted challenges posed by desertification, the connection between land degradation and

agricultural security, and the potential areas for solutions that can mitigate its effects on vulnerable populations worldwide.

II. History

A. Causes of Desertification

One of the leading causes of desertification is unsustainable agricultural practices. As crops are grown and harvested, the soil's fertility diminishes, reducing its ability to support crops and livestock. This often pairs with land overuse and excess pesticide/fertilizer use, meant to increase production and try to meet rising agricultural demands. The combination leaves the soil depleted and oversalinization by chemicals. Overgrazing and improper irrigation techniques exacerbate this issue. Livestock overgrazing depletes natural vegetation that serves as ground cover, which exposes the soil to wind and water erosion. In sub-Saharan Africa, over 60% of the land is at risk of desertification due to unsustainable grazing practices (Cherlet, 2018).

Irrigation practices, when not managed properly or taken too far, can lead to salinization and either water source depletion or waterlogging of the soil, rendering the agricultural land useless. Common agricultural practices like monoculture farming also play a role; excessive farming of one plant type can drain the soil of key nutrients and reduce its fertility over time.

Soil erosion is a significant contributor to desertification— around 24 billion tons of fertile soil are lost each year due to erosion (Cherlet, 2018), with agricultural activities being one of the major contributors. Erosion carries away viable topsoil, which is rich in nutrients necessary for plant growth. This process is made much worse by droughts and by the loss of protective vegetation, which connects deeply to the issue of deforestation.

Deforestation is a large problem that does exacerbate desertification. Between 2000 and 2010, the world lost an estimated 13 million hectares of forests per year, much of which was cleared for agriculture (Northoff, 2010). Clearing forested land for agriculture, urbanization, or other infrastructure development removes the vegetation that protects soil from erosion and

opens the ground to more sun exposure. Trees and other plants play a crucial role in maintaining soil structure and moisture levels-- mass deforestation accelerates soil degradation and increases the risk of desertification.

B. Climate Change

Climate change contributes to desertification by altering precipitation patterns and by increasing the frequency of droughts. Rising temperatures in many areas, coupled with changes in rainfall patterns, can lead to prolonged dry spells and lower water availability. As a result, arid and semi-arid regions experience intensified desertification. This leaves areas that were already vulnerable to desertification facing even greater challenges to sustain their agriculture. Changes in water availability, crop viability, and the spread of invasive species—all worsened by climate change— further complicate efforts to maintain agricultural productivity in these affected regions.

The relationships between desertification and climate change create a dangerous feedback loop. Healthy soil is a major carbon sink and is essential for controlling the natural carbon cycle. As land degrades, it releases that stored carbon and contributes to increased greenhouse gas emissions; this, in turn, accelerates climate change, which further worsens desertification. This feedback loop calls for urgent global cooperation to tackle both issues simultaneously, integrating desertification mitigation into broader climate strategies.

III. International Actions

A. United Nations Convention to Combat Desertification (UNCCD)

The UNCCD, established in 1994, is the only legally binding international agreement that focuses on land degradation and desertification (UNCCD). Its core objective is to combat desertification and mitigate the effects of drought through national action programs. The UNCCD established the Land Degradation Neutrality Target Setting Programme to

assist countries to achieve Land Degradation Neutrality, or LDN, by 2030 (UNCCD). The program takes countries through a structured process to help leverage, assess, measure and achieve their LDN commitments. To date, 131 countries have committed to setting LDN targets, and over 100 countries have already set those targets (UNCCD). The UNCCD is also working to establish an LDN fund and other global financial resources for countries to fight this issue.

B. The Great Green Wall Initiative

The Great Green Wall, launched by the African Union in 2007, aims to restore 100 million hectares of land of currently degraded land, both sequestering carbon and creating upwards of 10 million jobs (UNCCD). Eleven countries in the Sahel-Sahara region—Djibouti, Eritrea, Ethiopia, Sudan, Chad, Niger, Nigeria, Mali, Burkina Faso, Mauritania, and Senegal—have joined, attempting to restore native plant life and reduce the effects of land degradation (Schleeter, 2023). According to National Geographic, "the initiative uses an 'integrated landscape approach' that allows each country to address land degradation, climate change adaptation/mitigation, biodiversity, and forestry within its local context (Schleeter, 2023)." Over $14 billion has been raised to support the initiative (UNCCD).

IV. Projections and Implications

A. Agriculture and Food Insecurity

If desertification continues at its current rate, agricultural productivity will decline, leading to greater food insecurity and increased poverty in vulnerable regions. By 2050, the United Nations estimates that the global population will exceed 9.7 billion, with the majority of growth occurring in regions already struggling with desertification (UNDESA, 2019). This population growth will only increase the pressure on agricultural systems, compounded by further land degradation, will exacerbate food insecurity, poverty, and social instability.

In regions such as the Sahel—where the GGW Initiative is located—and parts of India, where agriculture relies heavily on rainfall, reduced soil fertility and water availability could lead to a 10-20% decrease in crop yields by 2050 (Cherlet, 2018). The production of staple crops such as maize, wheat, and rice may become less reliable, leading to food shortages and price spikes. This will increase food insecurity for millions of people, particularly in developing countries.

B. Technological Innovation Potential

While desertification is a very real threat, it also creates opportunities for technological innovation aimed at mitigating its impact. Advancements in technology—particularly in sustainable agricultural practices, water management, and land restoration—have the potential to transform how communities adapt to fight desertification.

Much of this can come from improving existing technologies or expanding their range of use. Practices such as precision agriculture, using advanced technologies like satellite imagery, sensors, and GPS mapping, enable farmers to optimize water and fertilizer use, monitor soil health, and enhance their crop yields. Implementing precision agriculture in dryland regions could increase crop yields by 20-30% while reducing water and fertilizer usage by up to 50% (Cherlet, 2018). The use of drought-resistant crop varieties, developed through genetic

engineering and selective breeding, is another potential area for innovation. These crops are designed to thrive in arid conditions, using less water and resisting salinity and pests.

Water scarcity, a primary driver and consequence of desertification, has spurred the development of innovative water management solutions. Technologies such as drip irrigation, which delivers water directly to the root zone of plants, can improve water efficiency by up to 90% compared to traditional irrigation methods (Cherlet, 2018). Solar-powered irrigation systems are also gaining traction, especially in regions with limited access to electricity, such as the Sahel and the Middle East (Cherlet, 2018).

V. Conclusion

Fighting desertification requires coordinated international action that must consider policy reforms, financial investments, and the adoption of more sustainable agricultural technologies/practices. The UN, along with national governments, must continue to work towards halting and reversing land degradation. Continued research and innovation, especially in water management, soil restoration, and agricultural techniques, will be essential in addressing the complex challenges posed by desertification. UNEA stands to make international changes that can be large steps towards all of these things, and that is where your task begins as a committee.

VI. Questions to be Addressed

1. What role can technology play in restoring degraded land and preventing further desertification?
2. How can countries balance economic growth with environmental sustainability to prevent desertification?
3. What are the most effective strategies for ensuring countries that suffer from desertification have the resources they need?

4. How can the international community collaborate more effectively to monitor and address desertification on a global scale?
5. How does water insecurity appear within your country? What policies has your country enacted to fight this issue?

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Topic B: How to Address the Growing Needs for Lithium and Other Critical Minerals Used for Technology, Both Ethically and Sustainably

I. Introduction

Critical minerals—such as lithium, copper, nickel, graphite, and rare earth elements—are essential components in clean and renewable energy technologies, including solar panels, wind turbines, and electric vehicle batteries. As the global community shifts toward greener energy systems to combat climate change, the demand for these minerals is rapidly increasing. Many minerals, such as lithium, are on pace for demand to reach more than double the available supply by 2050 (International Energy Agency, 2024). Furthermore, the extraction and processing of critical minerals poses significant environmental and social challenges, including issues of habitat destruction, water pollution, greenhouse gas emissions, and the exploitation of vulnerable communities. In fact, the processing of these critical minerals can release anywhere from 3 to 60 times their weight in carbon dioxide emissions and may pollute freshwater- accumulating in high, toxic concentrations (IEA, 2024).

The United Nations Environmental Assembly (UNEA) recognizes the challenges that the duality of critical mineral acquisition contributes to cascading negative environmental effects and the necessity of critical minerals to aid in the mass-production and development of clean, renewable energy technologies posits. This background guide aims to provide delegates with a comprehensive understanding of the issue and suggest further research avenues to resolve the imminent critical mineral catastrophe.

II. History

A. Lithium and Electric Vehicles

Electric Vehicles (EVs) have become increasingly prevalent in society, with sales growing more than sixfold over the five-year period from 2018 to 2023 (IEA, 2024). This surge in EV sales worldwide will undoubtedly drive up the demand for lithium, a critical part in EV batteries. During the same period, energy demand for EV batteries skyrocketed ninefold, rising from 100 gigawatt-hours (GWh) in 2018 to 900 GWh in 2023 (IEA, 2024).

As a result, lithium acquisition has significantly increased, with EV-related demand growing from eight kilotons in 2018 to 77 kilotons in 2023. This demand is projected to continue climbing, with experts estimating that by 2025, EV-related lithium demand will double the 2023 levels (IEA, 2024). Furthermore, leading analysts warn that within the next decade, lithium demand is likely to outpace supply.

However, this growing demand for lithium also brings serious environmental concerns. Mining lithium is a resource-intensive process that can deplete water supplies, degrade ecosystems, and release greenhouse gases. In some regions, particularly in arid areas where lithium extraction occurs, excessive water use for mining operations can lead to water scarcity, harming both local communities and biodiversity.

B. Critical Minerals in Other High-Demand Technologies.

Critical minerals such as copper, zinc, and silicon are essential for renewable energy technologies. While their demand is growing more gradually compared to lithium, the upward trend reflects increasing investment in technologies like solar photovoltaic (Solar PV) cells and wind turbines. In 2023, over three-quarters of renewable energy additions were Solar PV cells, and the International Energy Agency (IEA) projects that by 2050, half of all renewable energy will come from Solar PV. Wind energy is also expanding rapidly, with its capacity expected to double by 2028 (IEA, 2024).

This significant shift toward renewable energy, however, comes with considerable short-term environmental costs. For instance, silicon and copper account for nearly all the resources needed to manufacture Solar PV cells by weight, while copper and zinc dominate the composition of wind energy technology. Mining and processing these critical minerals can result in habitat destruction, soil and water contamination, and high energy use, which paradoxically contributes to greenhouse gas emissions.

Despite these challenges, critical minerals are indispensable for achieving a renewable energy future. The demand for these resources is intrinsically tied to the global transition away from fossil fuels, and their supply must increase to support the development of sustainable energy systems. Balancing the environmental costs of mining with the long-term benefits of clean energy is crucial to ensuring a sustainable energy transition.

III. International Actions

A. The UN Secretary-General's Panel on Critical Energy Transition Minerals

In September 2024, the UN Secretary General's Panel released a report outlining guiding principles as well as recommendations for sustainable and ethical transition to renewable energy. The report underscored the reality of human rights violations often occurring while mining for critical minerals (UN, 2024). It highlighted the abuses of Indigenous people's lands and exploitation of women and young children. While the world transitions to more environmentally conscious energy consumption, the UN maintains the emphasis for prioritizing the ethical and sustainable transition towards renewable energy.

B. China at the Forefront

Leading the way towards renewable energy, China has continually invested in it. The country also has a strong hold on critical minerals, being responsible for more than 50% of the world's lithium supply and nearly 90% of rare earth metals. While China is currently one of the leading emitters of greenhouse gases, it also makes up most of the world's investments into renewable energy. More than three-fifths of Solar PV added globally comes from China. This

trend continues with China being responsible for more than half of the global capacity of electrolysers (IEA, 2024).

IV. Projections and Implications

A. Demand

By 2050, the global demand for critical minerals is expected to skyrocket as the world transitions to renewable energy and electric technologies. The International Energy Agency (IEA) projects that demand for minerals such as lithium, nickel, cobalt, and copper could increase by as much as 500% compared to current levels. This surge will be driven by the widespread adoption of electric vehicles, battery storage systems, solar panels, and wind turbines. Meeting this demand will require significant investments in mining, recycling technologies, and sustainable resource management. However, without proper planning, the environmental and social impacts of increased mining activity could undermine the benefits of the clean energy transition.

B. Clean Energy Technology

By 2050, renewable energy is expected to dominate global energy production, with technologies like solar PV cells, wind turbines, and battery storage leading the way. The IEA predicts that solar energy will account for nearly half of all renewable energy generation, while demand for batteries expects to continue growing almost exponentially. Together, these technologies are expected to supply most of the global electricity, drastically reducing greenhouse gas emissions and reliance on fossil fuels.

V. Conclusion

The United Nations Environment Assembly (UNEA) is committed to fostering sustainable solutions to meet the rising demand for critical minerals while minimizing environmental and social harm. The world must continue to invest in renewable energy while also balancing ethical and sustainable responsibilities. It is now the duty of this committee to help consolidate the issues of

critical mineral supply and demand, ethical acquisition and consumption, and short- and long-term environmental effects.

VI. Questions to be Addressed

1. How can countries work to foster a more environmentally and ethically conscious transition to renewable energy?
2. How do the effects of mining critical minerals locally affect the world both economically and environmentally?
3. How does your country acquire critical minerals? Where do they stand in terms of investing in renewable energy?
4. What can countries do to work together and tackle the ever-present effects of global warming?

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