

COMMITTEE: Environment

QUESTION OF: Addressing the thawing permafrost and its impact on the environment

SUBMITTED BY: Brazil

CO-SUBMITTED BY: Mexico, Panama, Finland, Estonia

SIGNATORIES: Portugal, Israel, Argentina, United Kingdom, France, Japan

To the General Assembly,

Recalling the adoption of the “Decade of Action for Cryospheric Sciences (2025-2034)” resolution of August 13, 2024 by the UN General Assembly,

Keeping in mind the fact that permafrost covers 9 million square kilometers of the Earth’s total land surface, much of which is contained in the Northern Hemisphere, and is responsible in supporting many Arctic ecosystems and livelihoods,

Defining permafrost as ground that stays at or below 0 degrees celsius for at least two consecutive years and can be made of a mixture of rock, sediment, soil, and sand that can range in thickness from a meter to over 1,500 meters,

Distressed over the rapid thawing rate of the permafrost layer, especially in high density regions such as the Arctic Circle and the Antarctic, where roughly 7% of near-surface permafrost has been lost in the last 30 years,

Recognizing that a portion of permafrost melting has transformed into a positive feedback loop due to self-induced thaw, and that the cycle must be interrupted before a runaway effect of extreme conditions and possibly, self-destruction of the environment occurs,

1. Urges for direct preventative measures against permafrost melting through naturally based infrastructure:
 - a. Crushed rock, such as gravel, can be used as thermal insulation blankets to create a reflective effect and natural cooling system over permafrost hotspots, thereby minimizing melting due to sunlight absorption and cooling the ice five times faster,
 - b. Cultivating layers of vegetation such as soil, moss, and fertilizer on top of layers of permafrost to expedite insulation,

- i. layers of algae will be incorporated between the permafrost and vegetation for the purpose of carbon capture and protection from UV radiation,
 - ii. fertilizer from the vegetation mixture will prevent algal blooms, while the algae's location between the layers mitigates the risk of absorbing sunlight;
- 2. Requests that countries who are less developed may not be able to afford such measures to stop permafrost, particularly those who may be less affected, and therefore will not be expected to produce results to the same extent as developed countries,
 - a. Countries that qualify for leniency are based on, but not limited to, a country's GDP, population, population growth, primary economic activities, and location.
 - b. Countries that are more developed are expected to help less developed countries financially, and work more on research and infrastructure development.
- 3. Emphasizes the importance of addressing the worsened atmospheric air quality due to carbon and methane release:
 - a. Establishing Direct Air Capture (DAC) machines in high density melting areas and industrial facilities to capture carbon from the atmosphere,
 - b. Employing the MethaneSAT, a satellite designed to monitor and quantify global methane emissions,
 - i. developed via a collaboration between the Environmental Defense Fund (EDF) and Harvard-based scientists,
 - ii. capable of contributing to currently missing emissions data regarding greenhouse gas emissions into the atmosphere,
 - iii. can modify its focus based on location of permafrost thawing,
 - c. Working with the non-governmental organization Arbor Day Foundation to plant more trees globally,
 - i. mainly focusing on tropical, subtropical, temperate, and boreal zones, as well as previously degraded land for both maximum carbon capture and restoration,
 - ii. would be able to produce more oxygen in the atmosphere to work in the carbon emissions cycle,
 - d. Utilizing other carbon removal methods which nations are economically suitable, including but not limited to biomass carbon removal and storage, carbon mineralization, and accelerating natural carbon cycles in the ocean via increased photosynthesis, electric currents, or mineral additives;

4. Suggests data and research collection regarding the general state of permafrost melting and all the environmental consequences through the UNEP and IPCC by:
 - a. Looking into reemergences of ancient bacteria with the help of researchers, with samples of these ancient viruses collected for the process of creating safe anti-viruses and anti-microbials,
 - i. These anti-viruses will be distributed throughout the water in permafrost melting regions to combat the effects of the bacteria,
 - ii. As scientific research is promoted within the Decade of Action, the anti-viruses will also be closely monitored in order to gauge effectiveness,
 - b. Carefully recording exactly how much carbon and other green house gasses get released as the permafrost melts;

5. Considers it desirable for the eventual adaptation of affected and associated regions and infrastructure against potential collapse due to thawing ice:
 - a. This initiative will focus mainly on the Arctic communities, mountain villages, and low-lying coastal communities and islands,
 - b. Will be a long-term plan to reinforce civilian houses, roads, general ground stability, septic systems, and pipelines while avoiding landslides and thermokarst lakes, funded by the UN Climate Action Account in affected areas,
 - i. Utilizing materials such as steel wire armor and high-density polyethylene (HDPE) to reinforce underwater components,
 - ii. Modifying structures to contain mesh and stilt frames to allow for winter airflow underneath to maintain ground temperatures and fire-resistant building materials to avoid releasing additional methane,
 - iii. Installing thermosyphons near at-risk buildings to stabilize permafrost,
 - c. Implementing water filtration systems into pipelines near civilian communities and deploying temporary sea walls to decontaminate biomass and other substances from the water;

6. Recognizes the major effect that permafrost thawing has on the role and lifestyle of Indigenous populations within colder regions,
 - a. Developing a humanitarian aid response system for communities who have become food insecure,
 - b. Establishing Arctic Shelter Units (ASU) for communities who have had homelands washed away and destroyed, as well as those who face imminent displacement or relocation,
 - c. With the permission from the Indigenous groups, flood barriers will be established in their lands,
 - i. Particularly in flood and erosion prone areas near ancestral burial grounds and lands,
 - ii. Sandbags and pumps will also be provided to prevent further flooding in housing areas,
 - d. These groups will have the opportunity to instruct individuals from other nations on traditional ways of hunting and gathering local resources in order to preserve the environment, and raise awareness of their culture;
7. Suggests a public awareness campaign done by the IPCC or UNEP through television and social media to discuss and bring awareness towards:
 - a. what permafrost is and the role it plays in maintaining worldwide ecosystems
 - b. the amount of thawing permafrost and what is causing such a large scale thawing
 - c. how communities might try to help maintain permafrost through reducing emissions, restoring ecosystems, managing water, and protecting vegetation;
8. Requests the UNEP and the IPCC to create an international permafrost data-sharing platform to record locations, levels, and melting rates of permafrost around the world and to have this information be publicly available and included in climate reports and climate recommendations.