

Solar Geoengineering: Perspectives on Risks, Governance, and Political Challenges

Keynote Address by Hon. Ralph Regenvanu,
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Distinguished guests, fellow Pacific Islanders, and global citizens,

I stand before you today not just as Vanuatu's Special Envoy for Climate Change and Environment, but as a voice for the Pacific - a region on the frontlines of the climate crisis. Our islands, our homes, our very way of life are under existential threat from rising seas and intensifying storms. Yet even as we face these grave challenges, we find ourselves confronting a new and potentially more insidious threat: solar geoengineering.

Solar geoengineering, or solar radiation modification, proposes to artificially cool the Earth by injecting reflective particles into the stratosphere to block incoming sunlight. On the surface, it may sound like an appealing quick fix to our climate woes. But I am here to tell you that for Vanuatu, for the Pacific, and for vulnerable nations around the world, solar geoengineering represents an unacceptable risk that we cannot afford to take.

Let me be clear: the risks of solar geoengineering are profound and far-reaching. For island nations like Vanuatu, these risks are particularly acute. Our lives and livelihoods are intimately tied to natural systems that could be severely disrupted by solar geoengineering.

Consider our agriculture and food security. Pacific Island nations already struggle with food production due to limited arable land, soil salinization from rising seas, and increasingly unpredictable rainfall. Solar geoengineering could dramatically alter regional precipitation patterns, potentially devastating our fragile food systems. Models suggest it could weaken monsoons and disrupt weather patterns across the tropics. For nations that depend on subsistence agriculture and fishing, such changes could be catastrophic.

Our marine ecosystems, too, face grave threats from solar geoengineering. The Great Barrier Reef and coral reefs across the Pacific are already in crisis from warming and acidifying oceans. Dimming the sun will not solve ocean acidification, and could create new stresses on marine life adapted to specific light conditions. We cannot risk further damage to the reefs and fisheries that are central to both our economies and our cultural identities.

There are also profound concerns about solar geoengineering's impacts on human health. The sulfur particles most commonly proposed for injection are known to damage the ozone layer.

This could increase our exposure to harmful UV radiation - a serious health risk in our sun-drenched islands. We have also yet to fully study how these particles might impact air quality and respiratory health if they descend into the lower atmosphere.

But perhaps the greatest risk of solar geoengineering for the Pacific is the threat of termination shock. If solar geoengineering were to be suddenly stopped - whether due to unwanted side-effects, war, economic collapse, or shifting politics - it could lead to extremely rapid warming. Our islands are already struggling to adapt to gradual climate change. A sudden temperature spike could overwhelm our capacity to cope, leading to widespread ecosystem collapse and rendering many of our islands uninhabitable.

These are not abstract concerns. They strike at the very heart of our right to exist as Pacific peoples and nations. And yet, proponents of solar geoengineering argue that these risks are worth taking given the magnitude of the climate crisis. Or they advocate for investments in research, saying that we need to study all options.

To them I say: we in the Pacific are not your guinea pigs. We have seen this story before. For decades, colonial powers used our islands as testing grounds for nuclear weapons, leaving a legacy of contamination and health impacts that persists to this day. We will not allow ourselves to be subjected to another reckless experiment in planetary engineering.

Moreover, entertaining solar geoengineering as a climate solution creates a grave moral hazard. It offers high-emitting nations an excuse to delay the rapid emissions cuts and economic transformations that are truly necessary to address climate change. It is no coincidence that some of the loudest voices calling for solar geoengineering research come from countries with powerful fossil fuel lobbies.

This brings me to a crucial point: the issue of global justice and equity in climate action. Vanuatu, like most Pacific Island nations, has contributed negligibly to global greenhouse gas emissions. And yet we find ourselves on the front lines of climate impacts, fighting for our very survival. Now we are being asked to accept the unknown risks of solar geoengineering - a “solution” that once again puts the interests of major emitters ahead of the most vulnerable.

This is fundamentally unjust. It perpetuates a system where the Global North continues to exploit the Global South, using our lands and our atmosphere as a dumping ground for their pollution and their risky technological fixes. We reject this neo-colonial approach to climate action.

Instead, we in Vanuatu believe the only just and effective path forward is to address the root cause of climate change: greenhouse gas emissions. We need rapid, deep cuts in fossil fuel use coupled with massive investment in renewable energy and ecosystem restoration based on respect for Indigenous and human rights. We need a transformation of our global economic system to one that values sustainability and equity over endless growth and exploitation.

This is why at the recent UN Environment Assembly, Vanuatu and Fiji proudly stood with our African sisters and brothers in calling for a global governance mechanism to ensure the non-use of solar geoengineering technologies. We believe such a mechanism is essential to protect vulnerable nations and ecosystems from the risks of unilateral deployment.

But we are going even further. Vanuatu has proposed an amendment to the Rome Statute that would recognize “ecocide” as a crime under international law. This would create a legal framework to hold accountable those who cause severe and widespread damage to the environment - whether through reckless emissions or dangerous geoengineering schemes.

We have also led the charge to bring climate justice before the world’s highest court. In a grassroots initiative that has galvanized our nation, Vanuatu has spearheaded a successful campaign to request an advisory opinion on States’ responsibility for climate harm from the International Court of Justice.

Importantly, in these pending proceedings, Vanuatu is advocating for a ban or non-use agreement on solar geoengineering. We believe such an agreement is necessary to uphold the precautionary principle and protect the world’s most vulnerable peoples and ecosystems.

Some may say that our position is too extreme, that we are closing the door on potentially useful technologies. To them I say: the truly extreme position is to gamble with the future of our planet on unproven, high-risk interventions. The truly radical act is to continue business as usual in the face of climate breakdown.

What we propose instead is a recommitment to the principles of multilateralism, equity, and environmental stewardship that are at the heart of our international legal order. We call for a global effort to rapidly phase out fossil fuels, scale up renewable energy, and protect and restore natural carbon sinks. We demand that major emitters fulfill their moral and legal obligations to support climate adaptation and compensate for loss and damage in vulnerable nations.

This is the path of true climate leadership. It is a path that addresses the root causes of our crisis rather than merely treating the symptoms. It is a path that upholds the rights and dignity of all people, not just those with the technological and economic power to reshape our planet’s systems.

To the world’s richest nations, I say: we understand the allure of technological fixes. But we implore you to resist this temptation and instead redouble your efforts to transform your economies and societies. Invest in renewable energy, sustainable transportation, and regenerative agriculture. Put a price on carbon that reflects its true cost to our planet and people. And support us in the Global South as we build resilience and forge our own sustainable development paths.

To my fellow Pacific Islanders and to vulnerable peoples around the world, I say: we must stand united in opposition to solar geoengineering and in support of real climate solutions.

Our voices and our lived experiences are powerful. We must continue to bear witness to the impacts of climate change and to champion the rights of nature and future generations.

The road ahead is challenging, but we in Vanuatu and across the Pacific have never shied away from a fight when our survival is at stake. We are warriors and navigators, intimately attuned to the rhythms of our ocean and skies. We know that the solutions to climate change lie not in blocking out the sun, but in rekindling our connection to nature and to each other.

Let us move forward not in fear, but in hope and determination. Let us reject the false promises of solar geoengineering and instead build a future grounded in justice, sustainability, and respect for the natural world. Our islands, our ocean, and our planet deserve nothing less.

Thank you.