

Don't Geoengineer Africa: Hands Off Mother Earth! **Alliance Policy Brief**

March 13, 2024



This HOME! Alliance Policy Brief has been published by the HOME Africa working group on Geoengineering, and was distributed to delegates at the 6th United Nations Environment Assembly in Nairobi in February 2024. You can [download the briefing in English](#) (the French version will be available soon) or read it in full below.



Contents

- [Executive Summary](#)

- [What Is Geoengineering?](#)
- [Why Is Geoengineering Dangerous?](#)
- [How Is Geoengineering Being Normalised? Debunking The Myths](#)
- [What Is Happening In Africa And Other Parts Of The World?](#)
- [Geoengineering Links To Other Dangerous Distractions](#)
- [Africa As A Battleground](#)
- [The Battle at UNEA 6: Africa Rejecting Solar Geoengineering](#)
- [Moving Forward: The Call For Non-use Agreement](#)
- [What Needs To Be Done Instead](#)
- [Questions That Should Be At The Fore For Africans](#)
- [Conclusion](#)
- [Endnotes](#)

Acknowledgments

With support from Rockefeller Brothers Fund (RBF), this Policy Brief was produced by the collaborative efforts from the organizations whose logos are listed below. *The contents of this publication are the sole responsibility of the Working Group and do not necessarily have to reflect the views of donors.*

Executive Summary

African peoples are deeply concerned about harmful proposals to advance geoengineering technologies — large-

scale technological interventions in the Earth's oceans, soils and atmosphere, with the aim of tinkering with some of the symptoms of climate change rather than addressing its root causes.

Geoengineering technologies represent a grave, existential threat to people and the environment in both Africa and globally. As Africans, we unequivocally reject all forms of geoengineering and efforts to realise them in Africa or elsewhere.

Yet, we see Africa is being targeted by various actors to advance some of the most controversial technologies ever conceived. We see geoengineering proponents increasingly attempting to normalise geoengineering and confusing the public debate, while attempting to take advantage of African policymakers before they are fully informed.

We reject the narrative that Africa should be at the forefront of geoengineering research, and recognise this as a neo-colonial effort to co-opt African countries into supporting an agenda that is fundamentally against our interests.

Geoengineering represents a continued effort by rich countries, corporations and elites to:

- Evade their own responsibility for causing climate change, and their obligation to drastically reduce their excessive consumption and dangerous climate pollution;
- Continue to exploit Africa for fossil fuels and other resources for their own benefit;
- Shift the burden of climate change and risky technologies further onto Africa, the most vulnerable continent, which has done the least to cause climate change;
- Distract Africa from its focus on climate finance, adaptation and real solutions, and to skew finance away from African priorities towards the priorities of rich countries and corporations;
- Turn Africa into a testing ground for the most dangerous means of manipulating the atmosphere, land and oceans, and in doing so persuade Africans that these approaches are in their best interest and should become their own agenda; and
- Launch yet another attempt at controlling and recolonising Africa.¹

We urgently call on African governments to uphold the precautionary principle by enacting outright bans on all geoengineering technologies in African countries. In addition, African countries should support and strengthen current global agreements against geoengineering-related research, development and deployment, such as those agreed within the Convention on Biodiversity, London Protocol, and other international fora relating to nature,

human rights and sustainable development.

We strongly support the call for a global governance mechanism for non-use of solar radiation management by all African Ministers at The African Ministerial Conference on the Environment (AMCEN) 2023, and expect further African leadership towards the establishment of such an International Solar Geoengineering Non-Use Agreement.

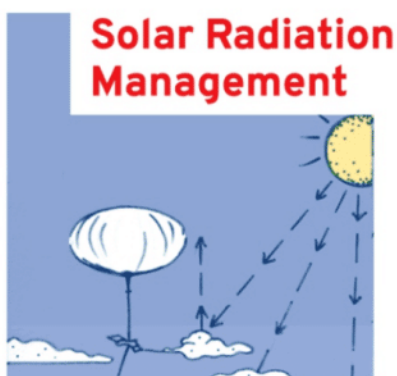
We insist that attempts at legitimising the notion that geoengineering technologies can have a role to play be effectively countered and exposed in all relevant fora. This includes the proposed resolution on Solar Radiation Modification (SRM) at the United Nations Environment Assembly (UNEA) in Nairobi in February 2024, which presents dangerous openings for normalisation of solar geoengineering, and should therefore be rejected in its present form.

We also call on our fellow activists in social movements and civil society organisations across all sectors and issues to join us in our mobilisation against geoengineering and for genuine and just transitions.

What is Geoengineering?

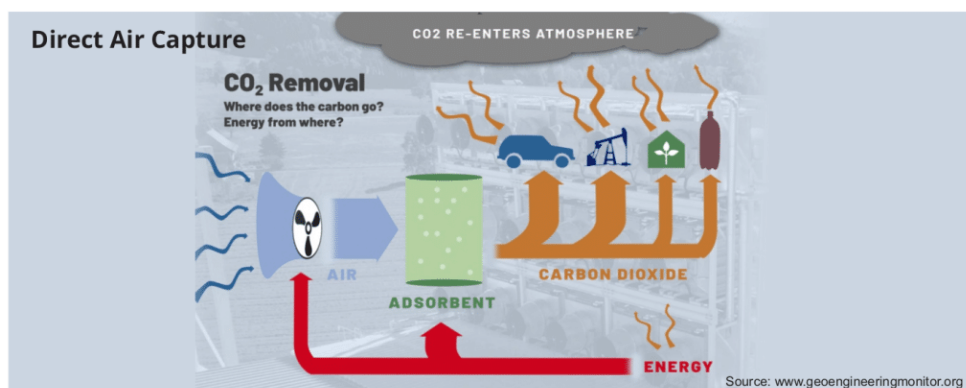
Geoengineering refers to the intentional manipulation on of the environment at a global scale in order to affect the climate in ways that limit or reverse some of the effects of global warming. Climate geoengineering encompasses highly speculative large-scale schemes for intervention in the earth's oceans, soils and atmosphere, usually temporarily and without addressing the root problem of emissions from fossil fuels and changing land use.

Geoengineering technologies include, for example, proposals for spraying sun-dimming pollutants into the atmosphere to hinder the sun's rays from reaching the Earth (Stratospheric Aerosol Injection) injecting large volumes of iron filings into the oceans to create enormous algal blooms with the hope that when the algae die carbon will be transported and buried at the bottom of the sea (Ocean Fertilisation), and large-scale interventions into farmlands or forests to draw down carbon- dioxide into plants, to be burned with the CO 2 then somehow captured and injected into the ground (Bioenergy with Carbon Capture and Storage (BECCS)).



Africa is also becoming increasingly targeted for propositions to commercialise Direct Air Capture (DAC) – the idea of constructing gigantic and highly energy intensive fans using toxic chemicals to suck up carbon dioxide directly

from the ambient air. The proposal is to store the carbon underground. But the business model often includes offsets, the production of petrochemical products from the captured carbon, and / or enhanced oil recovery - basically turning an already absurd proposal into an even bigger climate problem. Big polluters like DAC as a cover up for expansion of production of fossil fuels.



Most geoengineering-related interventions in the atmosphere, on land and in the marine environment fall under two categories:

A. Geoengineering-scale Carbon Dioxide Removal (CDR):
Large-scale schemes to remove carbon dioxide from the atmosphere.

- Direct Air Capture (DAC)
- Bio-Energy with Carbon Capture and Storage (BECCS)
- Ocean Fertilisation (OF)
- Biochar
- Algae-based CDR

B. Solar Radiation Modification (SRM): Schemes to reduce warming by reflecting sunlight

- Stratospheric Aerosol Injection (SAI)
- Marine Cloud Brightening (MCB)
- Surface Albedo Enhancement
- Space-based Shading

www.geoengineeringmonitor.org provides more detailed briefs and explanations of the different geoengineering techniques.

Behind all geoengineering schemes is a hubristic presumption that humans are capable of precisely managing the unprecedented, complex and inherently unpredictable global climate and environmental impacts of these technologies, including when wielded by totalitarian governments and unaccountable corporations. Geoengineering proponents commonly justify their work as an effort to gain time on and de-escalate the climate crisis, while in reality geoengineering will simply further destabilise already dangerously destabilised planetary systems.

SRM would impact global and regional climate and weather systems at their core, with consequences that could simultaneously trigger devastating impacts across several continents. Modelling has suggested that Stratospheric Aerosol Injection could for example unsettle the Indian monsoon and exacerbate droughts in large parts of Africa with devastating consequences for millions or even billions of people.²

For **carbon dioxide removal** technologies such as Bio-Energy Carbon Capture and Storage (BECCS), Direct Air Capture (DAC) or Ocean Fertilisation to have any theoretical impact on the global average temperature their scale would need to be enormous.³ Geoengineering-scale CDR would unavoidably cause severe disruptions to ecosystems. Some climate models have assumed creation of BECCS plantations as large as a third of the entire landmass of Africa. In fact, a certain global land gap report estimates that it would require 1.2 billion hectares of land to effectively fulfil governments' pledges for all land-based CDR techniques.⁴

The impacts of vast algal blooms resulting from Ocean Fertilisation would likely cause severe ripple effects on ocean ecosystems.

Why is Geoengineering Dangerous?

Climate change is one of the most dangerous and pressing challenges facing humanity, but responses that may be as or even more dangerous cannot be justified. Geoengineering technologies are either highly speculative or have been debunked, and each presents numerous risks that justify their rejection. Here are some of the risks:

Providing the fossil fuel industry and big polluters excuses

As people are starting to realise that society can and must decarbonize to real zero emissions as quickly as possible, and that we already have the technologies to do so, geoengineering provides fossil fuel and other polluting industries with yet another excuse to delay taking the action required. This may cause us to miss the opportunity we have for genuine and timely societal transformation.

Direct impacts on livelihoods and ecosystems

All forms of geoengineering would have direct dangerous impacts on both communities and ecosystems. Their very scale makes them inherently problematic and challenging, and even impossible to control. They are based on a hubristic mindset that humans are able to precisely manage global-scale systems despite their vast complexity and unpredictability.

Exacerbating Neo-Colonialism, Inequality and Climate Injustice

All forms of geoengineering are likely to favour those in power, whether corporations or governments of wealthy countries. These technologies provide business opportunities for a small elite, and an excuse for maintaining the present, deeply unjust model of development and excessive consumption by the few, to the detriment of large parts of the African⁵ population. As attention is directed towards investment in geoengineering technologies (largely by outside interests), there is also a risk that resources and support will be redirected away from mitigation, adaptation and loss and damage in Africa.

Solar Geoengineering: The Threat of Devastating Termination Shock

Solar geoengineering would rely on continuously loading sun-blocking particles into the stratosphere in order to mask the warming impacts of greenhouse gases. If the injection of particles were to be suddenly stopped – due to war, geopolitical disputes, devastating impacts on weather systems, or societal collapse – temperatures would quickly spike when the sun-blocking particles fell to the ground. Such a ‘termination shock’ would likely rip ecosystems and societies apart.⁶

Solar Geoengineering: Impossible Governance and Risks of War

Beyond its direct impacts and immense risks, many scholars of peace and conflict and environmental governance also fear that disagreements over how, when and where to apply solar geoengineering could cause new conflicts and wars, and that the technology could even be used as a weapon of mass destruction in its own right. There is no evidence from human history to suggest that solar geoengineering deployment could be governable.

Carbon Dioxide Removal: Land Grabs and Destruction of Livelihoods

There is already immense pressure on land in the Global South, and CDR at the scale needed to impact global heating would exacerbate land grabbing and human rights abuses. Geoengineering technologies such as BECCS and DAC would add considerably to these pressures, with grave consequences for both people and biodiversity.⁷ Women are at particular risk as their lack of land rights often make them more vulnerable to commercially-driven land dispossession. DAC would also put huge additional indirect pressure on lands in that it would require 100% renewable energy to make any sense climate-wise. The harnessing of this additional solar and wind energy would require vast additional land areas and critical minerals – much beyond the current, unmet needs by African people.

Geoengineering Threatening Human Rights

Geoengineering is clearly not compatible with human rights. The UN’s Human Rights Council Advisory Committee states in its report on the ‘Impact of new technologies intended for climate protection on the enjoyment of human rights’ (A/HRC/54/47, 10 August 2023), that because such technologies “are meant to be applied on a global scale, [they] have the potential to affect everyone indiscriminately. They could seriously interfere with the enjoyment of human rights for millions and perhaps billions of people.”

How is Geoengineering being Normalised? Debunking the Myths

Despite these threats, several actors are attempting to normalise the idea of geoengineering. For geoengineering-scale CDR, this is already far underway, to the extent that several geoengineering technologies are being discussed within the UNFCCC and even being incorporated into offsetting schemes and carbon markets – another set of dangerous distractions.

For SRM, the normalisation is still at a nascent phase, but with evidently well-resourced and networked actors trying hard to advance their pro-geoengineering agendas. Attempts to normalise geoengineering are based on a number of myths that need to be exposed:

“Plan B”

While many geoengineering proponents are advocating for geoengineering-scale CDR as a major component of ‘Plan A’, few are currently advocating for SRM to be deployed immediately – it is rather presented as a ‘Plan B’. However, research into it and the development of SRM technologies makes eventual deployment more likely. Once the technology has been developed it will be very difficult to ensure that it isn’t used, especially once actors other than the scientific community take control of its deployment.⁸

The Battle over Terms

As Africans, we must effectively see through the many traps and illusions surrounding geoengineering, including the misleading use of terms. As ‘geoengineering’ is becoming increasingly tainted, geoengineering proponents are inventing new terms that sound more benign. Examples include:

“Climate Altering Technologies and Measures” or “CATM”

“Climate Protection Technologies”

“Climate Intervention Technologies”

“Climate Restoration Technologies”

It’s Only Research

Geoengineering proponents argue that the more research the better, and that this is a neutral and impartial approach, while those rejecting geoengineering are often portrayed as anti-research and anti-science. In reality, no research is impartial, and the objection is to particular kinds of research. In the case of SRM, real-world research and experimentation would also serve to normalise and legitimise the technology, and put the world on a slippery slope towards deployment.⁹ Rather, SRM must be treated in similar ways as other areas that the international community has deemed no-go, such as eugenics, chemical weapons and human cloning: real-world experimentation must not be allowed.

As a climate expert, I consider these environmental manipulation techniques extremely risky. And as an African climate expert, I strongly object to the idea that Africa should be turned into a testing ground for their use.

Chukwumerije Okereke.

My Continent Is Not Your Giant Climate Laboratory

New York Times April 18, 2023

Appropriating climate justice narratives

Geoengineering proponents seem to have adopted a strategy of attempting to co-opt the climate justice narrative of social, climate and youth movements. Their attempts to frame solar geoengineering as a matter of climate justice claim that the countries and communities that are most vulnerable to climate change will have the most to benefit from such technologies, and that future generations need to demand these technologies as future options. Conveniently, they fail to highlight what research and modelling already show us: that those that are the most vulnerable to climate change would also suffer the ecological, climate and social impacts of geoengineering the worst.

Neither do these narratives acknowledge how the kind of research and technology development they promote consolidate vested industry interests and lock-in effects that both makes SRM deployment more likely and result in a closing of opportunities for transformative systems change – the only way towards genuine climate justice and well-being for vulnerable countries and future generations.

‘Impartiality’ and ‘neutrality’

It is impossible to be impartial and neutral when it comes to geoengineering. It is also revealing how in most cases the so-called ‘neutral’ position is in fact an extreme position, due to the fact that it enables research and development of geoengineering technologies, while the precautionary and common sense positions of restricting, banning and enacting strict moratoria are regularly portrayed as extreme or marginal positions, and often not even represented in spaces hosted by geoengineering proponents. African civil society and governments have an important role to play in asserting the mainstream position that dangerous geoengineering technologies must be banned as a matter of common sense and precaution.

The article “The Oversight Commission’s Veneer of Neutrality is Solar Radiation Modification by Stealth”¹⁰ strikingly illustrates how the heavily criticised, privately-run and self-mandated Climate Oversight Commission has attempted to normalise solar geoengineering under the pretence of neutrality. The Commission, under the guise of multilateralism, argues for a solar geoengineering moratorium, but its version of this would allow and even encourage expanded real-world research and is significantly weaker than the existing moratorium under the Convention on Biological Diversity (CBD).^{11,12}

The so called “Risk-risk Framework”

While there is a recognition that there are severe risks associated with geoengineering technologies, the counter-argument of geoengineering proponents is that there are also severe risks associated with worsening climate change.¹³ Particularly, vulnerable countries,

i.e. most of Africa, are therefore told to judge which may be worse – as if these are the only options. Africa rather needs to assert that the choices at hand are either for the wealthy (former colonisers) and their corporations to undertake the transformative changes that are possible and needed to effectively deal with the root causes of climate change, or to face a climate predicament with possibly as severe consequences for themselves as for Africa.

What is happening in Africa and other parts of the world?

Geoengineering Monitor hosts an interactive geoengineering map, which features over 1,900 known geoengineering projects and experiments around the world. The map provides up-to-date and extensive information on existing, planned, completed and cancelled geoengineering projects, experiments and research, including carbon dioxide removal, solar radiation management, weather modification and more. The map currently includes 94 projects on the African continent. A 2021 evaluation of known African geoengineering projects found that the majority of projects to date are research projects initiated and funded by public and private donors from North America, Europe and Australia. This trend is continuing in the field of marine geoengineering, through actors such as OPR Alaska, and solar radiation modification research through the DEGREES Initiative. While these projects are often communicated as the Global North supporting Africa to contribute to climate-related research, the

agendas behind them are questionable to say the least. Another trend that has emerged over recent years is the increasing number of projects seeking to profit financially by selling carbon credits.

Geoengineering links to other dangerous distractions

The threats of geoengineering are closely related to other dangerous distractions, including:

1. Carbon Markets and Offsets

Carbon markets operating in combination with geoengineering will seriously aggravate the problems that each distraction brings. Offsets are in reality 'pollution permits' allowing actors (generally corporations and wealthy countries) to continue polluting while others (generally in the Global South) commit to reducing /avoiding emissions, or removing already existing greenhouse gases from the atmosphere.

Offsets are in reality 'pollution permits' allowing actors...to continue polluting while others (generally in the Global South) commit to reducing /avoiding emissions...

At best, this amounts to shuffling emissions around with no net reductions. In practice, offsets provide allow big polluters to delay and evade climate action, and also invite fraud, deception and human rights violations. Offset projects are notoriously exposed as being double-counted, non-permanent and involving activities that would have happened anyway, the result being a net increase in emissions overall.¹⁴

Offsets also commonly lead to land grabs and human rights abuses. Already, outright neo-colonial deals are being advanced where foreign firms are seeking to appropriate huge swathes of land for emissions offsetting schemes, including a mind-blowing 10% of Liberia's and Zambia's land masses, and 20% of Zimbabwe's.¹⁵ Offsets are also being developed for marine-based carbon removal schemes, and the combination of geoengineering-scale CDR schemes with the new offset mechanisms currently being negotiated under Article 6.4 of the Paris Agreement (with heavy lobbying by the removals industry) points to worsening impacts.

Alarmingly, offsets are already also creeping into the realm of solar geoengineering. US company 'Make Sunsets' – a rogue actor, has begun marketing 'cooling credits' which promises to compensate for people's emissions by selling the release of a few grams of supposedly sun-blocking sulphur dioxide from stratospheric balloons as offsets. It is hard to imagine anything more worrying than SRM deployed by private commercial interests combined with offsetting.

2. Carbon Capture and Storage (CCS)

Carbon Capture and Storage (CCS) is a key component of several geoengineering-scale CDR techniques. Both BECCS and DAC require CCS technology to inject captured CO₂ into underground formations.¹⁶ CCS is highly controversial in that it has become a key loophole enabling the fossil fuel industry to continue producing fossil fuels with the empty promise that CCS will at some point in the future be capable of capturing and safely storing the CO₂. CCS has consistently failed to deliver on these claims, and diverts focus away from the rapid and equitable

phase out of fossil fuels. It also introduces new risks such as explosions and leakage from underground storage areas and the enormous system of pipelines and other infrastructure that is required.^{18,19}

The very limited number of commercial-scale CCS schemes in operation today are also often combined with 'enhanced oil recovery', a practice which has been employed for decades by the industry and that reinjects the captured CO₂ into old oil and gas fields to increase their production, thereby increasing emissions overall.²⁰

Africa as a Battleground

As Africans, we can immediately spot when centuries-old patterns of colonialism repeat themselves, when the African continent is over and over again being used as a site of extraction, dumping ground and experimentation by wealthy countries and former colonial powers, often in collusion with domestic elites. Geoengineering is the latest of such attempts.

The Africa Carbon Market Initiative (ACMI) – which could allow offsetting through Direct Air Capture (DAC), Biochar and (Bioenergy with) Carbon Capture and Storage ((BE)CCS) – is currently being heavily promoted through a collusion of consultancy firm McKinsey, foreign interests, African entrepreneurs and the Kenyan president.^{21,22}

In terms of solar geoengineering, Africa is being targeted by a number of attempts to undermine the current, strong rejection of such technologies. Geoengineering proponents are visiting African capitals seeking access to Heads of State, ministers and high-level officials to convince them that Africa is falling behind and needs to catch-up and become a player in geoengineering-related developments.²³ The 'Degrees Initiative' cleverly funds young researchers to build their careers around geoengineering, thereby laying the ground for cohorts of African scholars predisposed to advancing the technologies and nudging the continent towards the edge of the deployment abyss. Well-resourced 'youth' organisations are being set up to portray the impression that African youths see these technologies as potential solutions to climate change.

Regardless, advocates have tried to entice African governments by offering to fund research projects, claiming that more research will shed more light on the dangers and benefits of the technology. One such organisation, the Degrees Initiative, says its mission is to put "developing countries at the centre" of the discussion around solar radiation management. But this just appears to be a way of trying to make Africa a test case for an unproven technology. Indeed more studies into this hypothetical solution look like steps toward development and a slippery slope to eventual deployment.

Chukwumerije Okereke

My Continent Is Not Your Giant Climate Laboratory

New York Times April 18, 2023

The Battle at UNEA 6: Africa Rejecting Solar Geoengineering

At the UN Environment Assembly (UNEA 6) negotiations in Nairobi, February 2024 the group of all African countries together with several other developing countries demonstrated major leadership that helped reset the debate around solar geoengineering.

Switzerland had tabled a resolution that would provide UNEP a mandate to set up an expert panel to assess

“benefits” and “risks” of solar geoengineering and author a report. Aware of the pro-geoengineering bias such a group and report would likely get, African negotiators re-framed the conversation by arguing that solar geoengineering should solely be discussed in terms of risk and pollution, not as a ‘climate solution’ and insisted the African Ministers (ACMEN) call for an International Solar Geoengineering Non-Use Agreement be recognized in the resolution.

Their clear and strong position was not acceptable for the US, Saudi-Arabia, Canada and Japan who wanted the resolution to instead open up for more research and further normalization of the technology. Switzerland in the end had to withdraw the resolution in the absence of any prospect for consensus. This was a victory for common sense, and set the ground for further promotion of a Non-Use Agreement and a strong rejection of solar geoengineering as several other developing countries, including Mexico, Colombia and Pacific islands joined and supported the African position during the negotiations.²⁴

Moving Forward

The Call For A Non-use Agreement

Fortunately, Africa is resisting, particularly on solar geoengineering. The AMCEN decision by all African Environment Ministers from August 2023 provides global leadership in its clear call for “a global governance mechanism for the non-use of solar geoengineering”, laying the groundwork for widespread adoption of the International Solar Geoengineering Non-Use Agreement. This significant decision by African ministers was followed by a similar resolution by the European Parliament in November 2023 calling on the EU Commission and its Member States “to initiate a non-use agreement at international level, in accordance with the precautionary principle and in the absence of evidence of its safety and a full global consensus on its acceptability.”

African countries are well-placed to play a leading role in building political momentum alongside for example similarly-critical European countries and Mexico (which recently banned all forms of solar geoengineering following the Make Sunsets commercial and unauthorised release of SRM particles from its territory).

5 Core Measures in International Solar Geoengineering Non-Use Agreement

- No public funding
- No Support in international institutions
- No patents
- No deployment
- No outdoor experiment

Many scholars, experts and activists have concluded that such technologies cannot be managed equitably and safely. Advancing solar geoengineering assumes the existence of stable global systems of governance that could function without failure for hundreds or thousands of years – an impossible requirement.

The Climate Book

THE INTERNATIONAL SOLAR GEOENGINEERING NON-USE AGREEMENT (SGNUA)

The call for a global Solar Geoengineering Non- Use Agreement is supported by more than 500 academics, including some of the world's leading scholars of global environmental governance. The initiative is rapidly gaining traction with both the African Union and the European Parliament calling for its adoption. Numerous civil society organisations are also backing the call, including members of African civil society, climate justice organisations and Climate Action Network International, representing 2000 organisations across all continents.

The SGNUA recognises the many risks associated with SRM, and concludes that the use of the technology is ungovernable. It would not be possible to ensure functional governance of deployment over many generations, and African countries would be allowed little input when disputes and conflicts over its use escalate. To ensure non-use, it follows that measures that facilitate the development and deployment of the technology must not be allowed. SGNUA therefore calls for provisions that reject deployment as well as all real-world experimentation, public funding, patenting or support in international organisations.

www.solargeoeng.org

STRENGTHENING EXISTING AGREEMENTS

As well as championing a Non-Use Agreement, African countries also need to protect and strengthen already significant international agreements on geoengineering, including the 2010 de facto moratorium on geoengineering at the Convention on Biological Diversity (CBD), the bans on marine-based geoengineering technologies under the London Convention/London protocol and the Precautionary principle set out in the 1992 Rio Declaration.

What needs to be done instead?

Climate change poses an existential threat to both Africa and the world as a whole. We must succeed in tackling it. In doing so, we must understand that climate change is only an expression of a set of intertwined, deeper, underlying problems that has to do with power structures, development, inequality, patriarchy and colonialism.²⁷

It will not be possible to successfully address climate change without also tackling these structural issues. Large-scale techno-fixes such as geoengineering cannot 'solve' climate change, and would only introduce new impacts and injustices.

If you accept the severity of climate change but are not willing to accept the necessity for systems change and profoundly addressing the underlying root causes, only existentially dangerous techno-fantasies remain as options to square the equation. The current normalisation of dangerous distractions such as solar geoengineering is likely as dangerous and severe a threat as climate change itself.

Ignoring wishful thinking that technofixes such as geoengineering will come to the rescue, climate change does, on the other hand, provide momentum and imperative for real, transformative change, since we simply cannot compromise with nature.

Fortunately, real solutions abound, including through the use of technologies that are proven and can be safe and democratically controlled. Africa, and the rest of the world, has every possibility of embarking on a just transition and new development trajectories that are truly people-centred, ecologically sound and grounded in local realities, cultures and ecology.

The *Just Recovery Renewable Energy plan for Africa*²⁸ and the *Just Transition: A Climate, Energy and Development Vision for Africa*²⁹ reports are two of many inspiring visions for how African societies can follow new paths that are both climate compatible and can ensure well-being for all. The Just Transition report for example shows how genuinely pan-African, South-South cooperation that puts agroecology and people-centred renewable energy at its heart can result in environmentally-sound new industrialisation in order to meet the continent's own needs.

Some of the key areas of action that need to be undertaken include:

1. Renewable energy and an equitable fossil fuel phase-out

A rapid and equitable phase-out of all fossil fuel production is essential for tackling climate change – there is no alternative. No technologies can justify the prolonged production and consumption of fossil fuels. Fortunately, Africa is endowed with the most abundant renewable energy sources, particularly solar and wind potential. Africa can clearly cater to all of the needs of its growing population through 100% renewable, people-centred and environmentally and climate-sound energy generation. African countries can simultaneously advance the calls for a Fossil Fuel Non-Proliferation Treaty and the Solar Geoengineering Non-Use Agreement as two, complementary treaties.

2. Ecosystem restoration: Sequestering carbon within the limits of what is socially and ecologically possible.

We are now at an atmospheric CO₂ concentration of 420 ppm, while many scientists put relatively safe levels at 350 ppm. Therefore we need to urgently stop emitting greenhouse gases and also remove CO₂ from the atmosphere. Many ecologically sound and important activities also prevent emissions and absorb and store carbon dioxide, including the restoration of ecosystems and wetlands, allowing forests to grow old and agroecological farming. These are things that are desirable in themselves and need to be promoted and enabled to their fullest potential. They have considerable potential in removing large amounts of CO₂ in ways that are not harmful. This is significantly different from large-scale CDR involving technological removals, where lands, livelihoods and ecosystems are directly threatened as a consequence.

3. Civil society, academic and government mobilisations: Don't Geoengineer Africa!

Africa needs to strengthen its mobilisation against geoengineering through continent-wide efforts across all countries and with involvement of civil society and social movements, Indigenous Peoples, academia and governments. While a rejection of geoengineering requires global approaches, individual countries and the continent as a whole can take unilateral measures immediately. African countries can continue to act on the AMCEN decision and legislate for domestic geoengineering bans, while at the same time working together for the advancement of international agreements such as the Non-Use Agreement, which needs to start with a coalition of front-runner countries.

4. Precaution and technology assessment

With the push for geoengineering on land, in the oceans and in the atmosphere, there is evidently a strong need to develop guidelines and tools for assessing all kinds of new and emerging technologies in Africa. Africans need to be able to decide on which technologies they need, how they apply them and when, and should not in any way be tricked, pressured, or cajoled into accepting technologies that are contrary to the well-being of their peoples. Mechanisms to enable the application of the precautionary principle, such as The African Technology Assessment Platform (AfriTAPS), need to be further strengthened and expanded.

Questions that should be at the fore for Africans

- Why is this technology being developed now?
- Who is behind its development?
- Who will benefit from this technology?
- What are the likely negative impacts of this technology and
- how widely-felt will they be?
- Who will be impacted most by this technology?
- Are there other alternatives to this technology?
- How will this technology be deployed and governed?
- Will the impacts of this technology spread beyond humans
- to other beings?
- Where will the technology be deployed?

Conclusion

The dangers posed by geoengineering are real, and Africa is currently one of the key battlegrounds. It is imperative for African civil society, academia and decision-makers to take action to ensure that Africa and the world do not slide into a future with geoengineering in it – and that real solutions for genuine climate action that ensure well-being and ecosystem health are implemented.

While the lobbying power and media presence of well-resourced geoengineering proponents have clearly increased over the last few years, it is important to bear in mind that these have always been and remain fringe ideas and extreme positions. Calls for the non-use and rejection of such dangerous technologies are getting louder by the day, and constitute the common-sense, mainstream view. Africa can and must be at the heart of efforts to reject geoengineering and embrace real and just solutions.

Endnotes

¹ Building on statement in 'Don't Geoengineer Africa' letter sent by 38 HOME Africa members and allies to AMCEN, 12 September 2022.

² Jones, A.C., et al., 'Impacts of hemisphere solar geoengineering on tropical cyclone frequency'. Nature Communications, 8, 2017:1382, <https://doi.org/10.1038/s41467-017-01606-0>

³ "Dykes, James, Watson, B and Knorr W. 2021. Climate scientists: concept of net zero is a dangerous trap". The Conversation (22 April 2021). <https://theconversation.com/climate-scientists-concept-of-net-zero-is-a-dangerous-trap-157368>

⁴ Oliver Perkins et al (2023) 'Toward quantification of the feasible potential of land-based carbon dioxide removal'. On Earth (15 December 2023). <https://www.sciencedirect.com/science/article/pii/S259033222300547X>

⁵ Stephens and Surprise (2019) The hidden injustices of advancing solar geoengineering research, in: Global Sustainability, Vol. 3: 1 – 6, <https://doi.org/10.1017/sus.2019.28>

⁶ Ray Pierrehumbert and Michael Mann. 2021. "Some say we can 'solar-engineer' ourselves out of the climate crisis. Don't buy it." The Guardian, (22 April 2022). <https://www.theguardian.com/commentisfree/2021/apr/22/climate-crisis-emergency-earth-day>

⁷ Direct Air Capture: Big Oil's Latest Smokescreen. Geoengineering Monitor (29 November, 2023). <https://www.geoengineeringmonitor.org/2023/11/direct-air-capture-big-oils-latest-smokescreen/>

⁸ Corry O. 2017. The international politics of geoengineering: The feasibility of Plan B for tackling climate change. Security Dialogue. 297-315 48.4 <http://journals.sagepub.com/doi/10.1177/0967010617704142>

⁹ What's Wrong with 'It's Just About Research'?. Interview with Professor Raymond Pierrehumbert, University of

Oxford. 1 June 2021. https://stopsolargeo.org/?page_id=253

¹⁰ Klönne, Uta, Schleusser, Carl-Friedrich and Hare, Bill. 2023. The Overshoot Commission's Veneer of Neutrality is Solar Radiation Modification PR by Stealth. Climate Analytics. <https://climateanalytics.org/comment/overshoot-commissions- veneer-of-neutrality-is-solar-radiation-modification-pr-by-stealth>

¹¹ See also Solare Geoengineering Non-Use Agreement Team. 2023. Response to Overshoot Commission Report. <https://www.solargeoeng.org/response-to-overshoot- commission-report/>

¹² Farand, Chloé. 2023. The Overshoot Commission is Talking About Solar Geoengineering. Not Everyone Thinks It Should. Climate Home News (12 June, 2023) <https://www.climatechangenews.com/2023/06/12/overshoot-commission-solar- radiation-management/>

¹³ One of the major players in efforts to normalise geoengineering, including the risk- risk narrative, has been the Carnegie Climate Governance Initiative (C2G). Its representatives consistently claim they are 'impartial' in publications and in their extensive interactions with decision-makers, but have in reality heavily impacted the discourse towards normalisation. It's own Impact and Learning report reveals with clarity its working methods, with conclusions such as "C2G commissioned a report using a 'risk-risk' framework for comparative analysis of use or non- use of SRM, which has emerged as a helpful framing for policymakers grappling to understand the implications and potential options available to respond to a world with continued rising temperatures and worsening climate impacts. This framework was consequently used in the 2023 UNEP "One Atmosphere" report, which was produced by some of the same authors." <https://www.c2g2.net/wp-content/uploads/C2G-Impact-and-Learning- Report-Final-Nov-Pages-and-spread-small.pdf>

¹⁴ Lakhani, Nina. "Revealed: top carbon offset projects may not cut planet-heating emissions". The Guardian (19 Sept 2023). <https://www.theguardian.com/environment/2023/sep/19/do-carbon-credit-reduce- emissions-greenhouse-gases>

¹⁵ Pearce, Fred. 2023. In New Scramble for Africa , an Arab Sheikh is Taking the Lead. Yale Environment 360. <https://e360.yale.edu/features/al-maktoum-uae-dubai-africa- carbon-credits>

¹⁶ Center for International Environmental Law. 2023. Direct Air Capture: Big Oil's Latest Smokescreen.

https://www.ciel.org/wp-content/uploads/2023/11/Direct-Air-Capture_Big-Oils- Latest-Smokescreen_November-2023.pdf

¹⁷ <https://climatenetwork.org/resource/carbon-capture-and-storage-dangerous-distractions/>

¹⁸ Over-Promising and Under-Delivering for Half a Century: CCS is Still a Risky and Unproven Technology. Geoengineering Monitor (18 January, 2024). <https://www.geoengineeringmonitor.org/2024/01/geo-map-ccs-jan-2023/>

¹⁹ Center for International Environmental Law. 2023. Carbon Capture and Storage (CCS) Frequently Asked Questions <https://www.ciel.org/wp-content/uploads/2023/02/Carbon-Capture-and-Storage-FAQ.pdf>

²⁰ Over-Promising and Under-Delivering for Half a Century: CCS is Still a Risky and Unproven Technology. Geoengineering Monitor (18 January, 2024). <https://www.geoengineeringmonitor.org/2024/01/geo-map-ccs-jan-2023/>

²¹ Power Shift Africa et al. 2023. The Africa Carbon Markets Initiative: A Wolf in Sheep's Clothing. https://www.powershiftafrica.org/storage/publications/The_Africa_Carbon_Markets_Initiative_Final_1701685468.pdf

²² Farand, Chloé. 2023. Leaks Reveal how McKinsey Drives African Climate Agenda. Climate Home News (27 November, 2023). <https://www.climatechangenews.com/2023/11/27/leaks-reveal-how-mckinsey-drives-african-climate-agenda/>

²³ Okereke, C. 2023. My Continent Is Not Your Giant Climate Laboratory. New York Times (18 April 2023). <https://www.nytimes.com/2023/04/18/opinion/geoengineering-climate-change-technology-africa.html>

²⁴ African Ministerial Conference on the Environment (AMCEN), Decision 19/5 Climate Change (p.32) <https://wedocs.unep.org/bitstream/handle/20.500.11822/43789/K2316003E-AMCEN-19-6-ADVANCE-REPORT.pdf?sequence=3>

²⁵ European Parliament resolution of 21 November 2023 on the UN Climate Change Conference 2023 in Dubai, United Arab Emirates (COP28) https://www.europarl.europa.eu/doceo/document/TA-9-2023-0407_EN.html

²⁶ Biermann, Frank. 2023. Mexico Bans Solar Geoengineering Experiments. <https://www.solargeoeng.org/mexico-bans-solar-geoengineering-experiments/>

²⁷ <https://www.theguardian.com/world/2024/feb/15/end-fossil-fuel-era-to-address-colonial-injustices-urges-prominent-historian?>

²⁸ Friends of the Earth Africa. 2021. A Just Recovery Renewable Energy Plan for Africa. <https://www.foei.org/wp-content/uploads/2021/08/Friends-of-the-Earth-Just-Recovery-Renewable-Energy-Plan-for-Africa-2021.pdf>

²⁹ Independent Expert Group on Just Transition and Development. 2023. Just Transition: A Climate, Energy and Development Vision for Africa. www.justtransitionafrica.org

³⁰ <https://www.handsoffmotherearth.org/>

