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Understanding the Future of Global Climate Movements

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Contents

01	Why Climate Sabotage Remains an Unlikely Strategy	1
	Noah Gordon	
02	The Growing Criminalization of Climate and Environmental Protests	9
	Oscar Berglund	
03	In Iraq and Yemen, Climate Activism Requires Both Defiance and Adaptation	15
	Issam Kayssi and Mohanad Hage Ali	
04	Women and Climate Activism in Morocco and Tunisia	25
	Sarah Yerkes and Natalie Triche	
05	Backlash Against Carbon Pricing in Australia and Canada	31
	Jasmin Logg-Scarvell	
06	Confronting Backlash Against Europe's Green Transition	39
	Erin Jones and Richard Youngs	

07	The Paradox in Southeast Asia's Decarbonization Agenda	47
	Debbra Goh	
08	Northeast India's Environmental Movements Have Taken a Climate Edge	55
	Daevan Mangalmurti	
09	For Arab Youth, Mass Mobilization Won't Fight Climate Change	63
	Valerie Boutros and Amr Hamzawy	
10	Climate Activism Across Urban and Rural Divides in the Middle East	69
	Amir Gohar	
11	Bipartisan Backlash Against Geoengineering and Carbon Removal in the United States	79
	Milo McBride	
	About the Authors	87
	Notes	89
	Carnegie Endowment for International Peace	119

Why Climate Sabotage Remains an Unlikely Strategy

Noah Gordon

Climate mitigation is not going well. Greenhouse gas emissions continue to rise, heat waves grow longer and deadlier, and extreme weather becomes more costly.¹ What matters to the atmosphere is not the rapid rise of clean energy technologies but the continued operation and even expansion of the fossil fuel infrastructure that is overheating the world.

What this means is that the member states of the UN have failed to address the climate problem in the thirty-plus years since they signed a treaty promising to do so, despite the efforts and urging of climate activists.² A pipeline cancellation here, a new solar power subsidy there: These victories for activists are only minor speed bumps for the runaway SUV that is the climate crisis.

A gap looms between the rhetoric and actions of global authorities. EU Commission President Ursula von der Leyen and former U.S. president Joe Biden both called climate change an “existential threat” in the early 2020s.³ Another world leader, UN Secretary General António Guterres, has spoken plaintively of politicians’ inability to get a handle on the challenge despite the demands for climate action. “Climate activists are sometimes depicted as dangerous radicals. But the truly dangerous radicals are the countries that are increasing the production of fossil fuels,” he has said.⁴

Other analysts or policymakers, from across the spectrum of climate politics, have raised questions about what type of activism would be appropriate in the face of catastrophe. There is the Republican member of the United States House of Representatives from the fifth district of California, Tom McClintock—a skeptic of the scientific consensus on global warming—who asks: “If the Earth truly hangs in the balance, well, then no measure is too

extreme. No cost is too great. . . . How much of a sacrifice is it if the alternative is a dead planet?”⁵ There is Andreas Malm, the professor of Human Ecology at Lund University in Sweden and the author of the book *How to Blow Up a Pipeline*, who has said:

“Were we governed by reason, we would be on the barricades today, dragging the drivers of Range Rovers and Nissan Patrols out of their seats, occupying and shutting down the coal-burning power stations, bursting in upon the Blairs’ retreat from reality in Barbados and demanding a reversal of economic life as dramatic as the one we bore when we went to war with Hitler.”⁶

This article asks what comes next for climate activists dealing with failure. As climate impacts get more severe, might climate activists become more inclined to take matters into their own hands, more willing to physically obstruct the workings of the fossil fuel machine or even to deploy violence against the people at the controls?

While the radical flank of the global climate movement is currently much smaller than headlines may suggest, these kinds of tactics may grow in popularity if decisionmakers continue to insufficiently address climate change. There is evidence of an overall intensification of climate activism, both of the actions of activists themselves, covered in this article, and of the backlash from civil society and leadership alike, covered by Oscar Berglund in an accompanying piece in the series. This article defines “climatage,” identifies trends in methods of activism, and explores what might come next for the radical flank of climate movements.

Defining Obstruction for the Climate and “Climatage”

This article is interested not only in property damage—often called “climatage,” a portmanteau of climate and sabotage—but also in occupations and blockades of infrastructure or key command centers, in which no property is damaged but the target is inhibited from taking action that exacerbates the climate crisis. The latter actions can be described as “obstruction for the climate.” This scope includes an occupation of a power plant that burns coal, or of a political building that approves new oil and gas pipelines, such as the U.S. Department of Interior headquarters, which protesters occupied in 2021. It does not include mainly symbolic actions that seek to garner media attention rather than disrupt fossil fuel—such as the throwing of soup on a famous Van Gogh painting in London by two Just Stop Oil activists in 2022. (The sociologist Dana Fisher calls such activists “shockers and disruptors”).⁷ This article also does not cover related but distinct forms of obstruction or violence for climate-related activism, such as physical actions that aim to prevent taxes on planet-warming fuels, like the Yellow Vest protests in France in 2021 or the farmers’ protests in Europe in 2023–2024; ecofascist violence; or land and environmental defenders’ obstruction of mining projects to protect their local ecosystems (when not explicitly linking their actions to climate change).⁸

What are some important types of climatage and obstruction? Activists often target coal infrastructure. In 2007, a group known as the Kingsnorth Six occupied the smokestack at a UK power plant in an attempt to shut it down. In a remarkable ruling, they were acquitted of property damage after turning to the “lawful excuse” defense in court, arguing that “by shutting down the coal plant for a day, they prevented greater damage to even more valuable property.”⁹ These activists later joined Greenpeace colleagues for further coal plant occupations in the UK to highlight the risks of carbon pollution.¹⁰

Coal blockades also took place in Australia in the 2000s and 2010s, as groups like Rising Tide used their bodies to try to slow the transport of the dirtiest fossil fuel.¹¹ In 2014 hundreds of protesters, many of whom were Indigenous people who called themselves Pacific Climate Warriors, attempted to use their canoes and kayaks to disrupt coal shipments from a Sydney port that they said was contributing to sea level rise. One activist from Fiji said, “We are not willing to drown because of climate change.”¹²

Further significant obstruction of coal infrastructure has come from the German group Ende Gelände, which roughly translates to “end of the line.” Since 2014 this group has occupied numerous coal mines.¹³ “By using our bodies to block the mining and by taking actions that break that law (with all the potential consequences),” said two members, “we point to the urgency of more effective action against climate change and halting lignite coal mining in Germany.”¹⁴ People have been hurt at some of these protests: In 2019 at a mine near Aachen, the police beat five protesters to the point of hospitalization, while four police officers suffered injuries, reportedly in connection with resistance from protesters.¹⁵ The group has also admitted to climatage in damaging machinery and pipes in an action at the Wilhelmshaven liquefied natural gas terminal in 2022.¹⁶

Oil and gas infrastructure is another common target. Activists with Climate Direction Action have temporarily stopped the flow of oil on the Keystone Pipeline in the United States.¹⁷ In Europe, protesters associated with Just Stop Oil and Extinction Rebellion have occupied oil terminals, obstructed pipeline construction, and disrupted fuel depots, airports, and government offices.¹⁸ Another mainly European group called Tyre Extinguishers prefers to target privately owned fossil fuel machines: The group says the aim is “to make it impossible to own a huge polluting 4x4 in the world’s urban areas.”¹⁹ Their fellow organizers in the Netherlands target an even more polluting type of transportation, the private planes at Schiphol Airport in Amsterdam: In 2022 hundreds of activists wearing white overalls sat in front of these planes’ wheels to prevent takeoff.²⁰

Nearly every aspect of modern industrial society contributes to the climate crisis, and recently some activists have taken climatage beyond the usual energy targets.

Nearly every aspect of modern industrial society contributes to the climate crisis, and recently some activists have taken climatage beyond the usual energy targets. In 2022, Swedish activists occupied a limestone mine in Gotland, complaining that the company running the associated cement plant was the country’s second-largest CO₂ emitter.²¹

Some groups take actions that could be understood as both climatage and sabotage to protect the local environment, sometimes called “ecotage.” In March 2022, the French group *Soulèvements de la Terre* built a wall to stop the construction of a new highway and built a camp to prevent the opening of a new reservoir, even firing improvised firework mortars at police officers.²² Their concern was that the giant reservoir represented the “privatization of water” and would damage the environment.²³ Days later, the group peacefully protested a nearby motorway project that one activist argued would entrench car culture and exacerbate global warming. In another instance in 2016, U.S. activists Ruby Montoya and Jessica Reznicek set fire to six machines constructing the Dakota Access Pipeline in Iowa.²⁴ In a statement before their arrest, they focused on the risk of oil spills and corporations “brutalizing the land, water, and people,” though their attorney did emphasize they felt a desire to halt climate change.²⁵ And they were part of a movement that did focus on climate impacts—indeed Greenpeace was found liable for \$650 million in damages for “defamation and other claims.”²⁶

Trends in Climatage

One thing that immediately stands out about these rare instances of climatage is where they have been recorded: predominantly in the rich countries of the so-called Global North. Investigating why can offer insight into the future of climatage and the climate fight in general.

The rich countries of the North Atlantic are where emissions are generally highest in per-capita terms, so there are plenty of targets for activists. But personal safety is also a factor. It is safer for three British citizens to spray-paint the UK offices of the corporation that insures the controversial East African Crude Oil Pipeline, which will run from Uganda to Tanzania, than it is to try to stop the pipeline on the ground in Africa, due to Britain’s stronger protections of civic freedoms.²⁷ In Uganda, activist Stephen Kwikiriza was allegedly abducted by national armed forces, beaten, and dumped on the side of the road as punishment for his campaign against the pipeline, whereas the British spray-painters were assigned community service.²⁸

The concentration of climatage and obstruction in rich countries may also indicate that considerable resources are required to engage in these activities.

That climatage and obstruction are concentrated in these rich countries may also indicate that considerable resources are required to engage in these activities. Even if an activist does not fear extrajudicial violence by the police, in order to engage in direct action they must have enough time to volunteer rather than work, enough money to contest a court case, and enough social connections to believe that a criminal conviction will not be the end of their career. As one study has shown, even within these wealthy countries, it is mostly educated members of the middle class who take part in climate protests.²⁹ The insidious nature of the threat has been a challenge for the

climate movement in general: Climate change is faceless; and its effects are gradual, indirect, and to some extent manageable for the world's richest and most influential, which means that society gets more animated about immediate problems like high prices or unwanted immigration.³⁰

Which protests are legitimate and who may take part? North Atlantic states and judicial systems display some implicit preferences. The contrast between how the media and courts treat protesting farmers and protesting climate activists is illustrative—for the latter, most face harsher punishment than community service. Five climate activists from the group Just Stop Oil were sentenced to four-plus years in prison for their role in blocking a British motorway in 2022³¹; the judge described them as “fanatics.” The long sentences fit a pattern of disproportionately harsh punishment for climate activists in wealthy European democracies.³² Germany and the Netherlands have even pre-emptively arrested activists before they arrive at protests.

On the other hand, protesting European farmers have often received gentler treatment from the authorities. The Dutch criminal lawyer Christian Flokstra, pointing this out, argues that “the sense of legal equality gnaws when police and the judicial authorities respond differently to civil disobedience or forms of activism. After all, the actions of climate activists did not endanger lives. Farmers’ actions did: they blocked highways, set fire to hay bales, and threatened politicians and journalists.”³³ In Belgium on February 26, 2024, farmers blocked the roads surrounding the European Commission with tractors and burning tires and threw objects at police officers, injuring three of them.³⁴ Only three protesters were arrested.³⁵ The angry farmers were back in force a month later.

Efficacy of Violence Versus Nonviolence

Another question concerning climatage is not whether it is morally justified or even legally justified, as the occupiers of the Kingsnorth coal plant successfully argued, but whether it works. Climatage is a tactic of the “radical flank,” which sociologists Brent Simpson, Robb Willer, and Matthew Feinberg define as a “discrete activist group within a larger movement that adopts an agenda and/or uses tactics that are perceptibly more radical than other groups within the movement.”³⁶ The radical flank effect can be positive or negative for a movement, either aiding it by making the demands of moderates appear more reasonable, or harming it by causing backlash against the movement as a whole.³⁷ For the climate movement, the idea is that radical sabotage can make politicians look more favorably on calls for moderate change by more institutionalized, formal climate organizations, just as the violent activity of the armed wing of the African National Congress eventually made the South African apartheid regime more willing to negotiate with Nelson Mandela.³⁸

A key text arguing against the use of violence in resistance movements comes from political scientists Erica Chenoweth and Maria J. Stephan, who found that nonviolent resistance movements since 1900 have been twice as successful as violent ones—though there are

challenges drawing parallels between this research and the climate struggle.³⁹ The scholars Ryan Gunderson and William Charles argue that nonviolent tactics will prove more effective in part because “(1) property destruction will likely decrease public support for climate activists and climate policy, [and] (2) property destruction will almost certainly increase state repression, a fight that climate activists will likely lose.”⁴⁰ These findings will encourage burgeoning groups like the Washington, DC–focused group Climate Defiance, which uses nonviolent direct action to “force [their] politicians to take action.”⁴¹

But nonviolent, disruptive tactics like blockades can similarly sour public opinion: One German poll found that street blockades reduced support for the climate movement in the country.⁴² However, other research has found that the nonviolent, disruptive campaigns of Just Stop Oil did generate support for moderate groups like Friends of the Earth.⁴³ Polling data can be useful, but it is difficult to get clear results about how climatage causes changes in public opinion, issue salience, and climate policy, given all the confounding variables. In their inventory of direct action tactics, the scholars Benjamin Sovacool and Alexander Dunlap argue that “unsavory” actions in some contexts do offer a chance of creating social change, although violence against humans would likely backfire.⁴⁴ As the philosopher Laurence Delina notes, there is a real risk of violent climate activism being branded as terrorism, and the movement being unable to rein in the activities of less principled members of their cohort.⁴⁵ If the movement did carry out radical violence against humans in service of political goals—like the Rote Armee Fraktion’s 1977 kidnapping of industrialist Hanns Martin Schleyer, a representative of a capitalist German state they felt was still infested with fascism⁴⁶; or Luigi Mangione’s alleged 2024 killing of a healthcare executive in New York City, meant to strike a blow against what he called a “greed fueled health insurance cartel”—it could backfire on climate activists at large.⁴⁷ The U.S. Federal Bureau of Investigations has long treated animal rights activists and environmental activists as terrorists.⁴⁸

On one hand, it is possible that the backlash against climate action could make some activists feel as if climatage or obstruction is their only option, as Oscar Berglund also notes. In the United States in 2025, for example, U.S. President Donald Trump’s administration has sought to reverse climate protection policies that it dismisses as a “Green New Scam,” removing pollution limits on power plants and subsidizing coal.⁴⁹ When the U.S. government threatens reprisals against peaceful protesters, as the Trump administration has threatened to deport noncitizens who speak up for Palestinians’ human rights, some activists may feel their only option is masked sabotage in the cover of night.⁵⁰ A number of U.S. states are also seeking draconian sentences for peaceful protests against oil or gas pipelines.⁵¹

On the other hand, the risks of sabotage tactics have likely increased as well. Trump and Attorney General Pam Bondi have said that direct action against allies of the president, such as against the Tesla dealerships of former Trump adviser Elon Musk, will be treated as “domestic terrorism,” with the president adding that perpetrators will “go through hell.”⁵²

Those who perceive climatage as the least bad option could be wrong. Climate activists’ challenge is distinct and perhaps even more daunting than the challenges previous activists faced in other contexts. In some social struggles, activists seek to influence the

decisionmaking of a relatively small set of actors. The Great Sit Down Strike of 1936–1937 at General Motors auto plants, for instance, helped force the company and other automakers to eventually accept the unionization of their factories.⁵³ Sabotage played a key role: Workers strategically occupied and shut down the few critical factories that produced car bodies, without which other factories could not operate.⁵⁴

But activists who want to stop the fossil fuel industry must change more than the behavior of a small number of firms or politicians. The fossil fuels, factories, and farms that cause the climate crisis are deeply ingrained in everyday life, all over the world, and the injustice and suffering they cause is indirect and diffuse. It would take sabotage on a tremendous scale to noticeably raise the costs of fossil fuel extraction and combustion, and doing so successfully could raise energy prices—a driver of much backlash protest in recent years—unless policymakers moved aggressively to blunt the effects of a fossil fuel scaledown.⁵⁵ Would-be saboteurs may be tempted to turn to direct action by the sense that the walls are closing in, and they need only temporarily step outside the democratic process until some emissions target is reached and they can pull down their barricades. Climate change, though, is an open-ended challenge, and climate action will require popular support to endure.⁵⁶

Activists who want to stop the fossil fuel industry must change more than the behavior of a small number of firms or politicians. The fossil fuels, factories, and farms that cause the climate crisis are deeply ingrained in everyday life.

And yet there is precedent for direct action against a small group of elites that sends a whole society over a tipping point and into reform. In his book *Abolishing Fossil Fuels: Lessons From Movements that Won*, the scholar Kevin A. Young argues that “the fundamental source of power” of the movements for the abolition of U.S. slavery, for labor rights, or for racial equality was the “direct threat they posed to capitalists through strikes, boycotts, and other mass disruption.”⁵⁷ For the climate movement, Young suggests, the path forward is not for climate-focused parties to win repeated large majorities, but rather for a sizable minority to apply “direct pressure on the elites who control energy-related investments.”⁵⁸

Where Are the Saboteurs?

Back in 2007, the writer John Lanchester commented that it was “strange and striking that climate change activists have not committed any acts of terrorism.”⁵⁹ Eighteen years later, with the climate crisis much deeper, the near absence of violence could be viewed as surprising. It is far from clear whether climatage would achieve its desired ends. But it is clear that as the climate crisis escalates, the conundrum of whether or not to resort to sabotage may gain increased urgency in parts of climate movements.

The Growing Criminalization of Climate and Environmental Protests

Oscar Berglund

The criminalization and repression of climate and environmental activists have intensified globally in the past few years.⁶⁰ These are forms of backlash against often impactful social movements. The repressive wave has sparked major concerns in many quarters, with the UN secretary general, the UN special rapporteur on environmental defenders, and many nongovernmental organizations (NGOs), politicians, and social movements speaking out against it.⁶¹ In this article I will draw on findings from a University of Bristol project that I led on this topic.⁶² Driven by a combination of state and corporate actors, the repression of climate and environmental protest is a truly worldwide phenomenon that takes place across the Global North and South.

The article first identifies five forms of criminalization and repression. These include using new legal measures, such as anti-protest laws, or misusing existing legislation to treat activists as terrorists or organized crime syndicates, as well as changing judicial processes to make sentences more likely. They also include a range of policing practices from legal (arrests) to extralegal (harassment and infiltration) and criminal (murder). These forms of repression are in turn fueled by the vilification of activists.

The second part of the article discusses how activists respond and adjust to repressive contexts. One long-used tactic is to counteract vilification by legitimizing activists as political actors. This includes bearing witness and calling out the use of extralegal and criminal repression used by state and corporate actors. Another, albeit sporadic, tactic is to engage in sabotage. Lastly, activists may focus on forms of disruptive protest that carry greater legitimacy, thereby making it more costly for state or corporate actors to repress them.

Criminalization and Repression

New Anti-Protest Laws

Such laws may create new offenses, extend maximum sentence length for existing offenses, give police more powers to stop protests and surveil activists, or stop NGOs from legally supporting activists. The UK's Police, Crime, Sentencing and Courts Act (2022), for example, allows police to restrict protests' starting and finishing times, as well as noise levels.⁶³ Likewise, various state-level laws in Australia and the United States expand the definition of "critical infrastructure" and target popular activist tactics, such as lock-ons.⁶⁴ Peru recently passed a law strengthening the ability of the Peruvian Agency for International Cooperation to repress NGOs. It stipulates that if an NGO receives funding from abroad, it cannot contribute to the legal defense of activists without state approval through the agency.⁶⁵ Many NGOs will now find it difficult to support those persecuted for widespread anti-mining activism in Peru.

Misuse of Existing Legislation

Second, existing laws are used in prosecutions and court proceedings to criminalize and repress climate and environmental activists. Anti-terrorism laws have been used in many countries against environmental activists who are definitely not terrorists. In the Philippines, authorities use a tactic called red-tagging to label activists as terrorists, thereby enabling more violent repression.⁶⁶ In France, the government sought to dissolve the environmental collective *Soulèvements de la Terre* using anti-separatism legislation originally intended to police so-called Islamic extremist groups.⁶⁷ In Germany and Spain, laws developed to deal with organized crime have been used against climate group *Letzte Generation* and vegan activist group *Futuro Vegetal*, respectively.⁶⁸ In the UK, courts have limited both the kind of defenses defendants can use and the kind of evidence that can be taken into consideration.⁶⁹ This has led to absurd situations where climate activists are on trial, but prohibited to speak about climate change.

Public and Private Policing

Policing is carried out not just by the police and other state actors but also by private security companies and corporations. Policing practices span from legal to extralegal to criminal. On the legal end, police arrest climate and environmental activists. Research from my project at the University of Bristol shows that Australia, Canada, and the UK exhibit the highest arrest rates at climate and environmental protests. Countries with lower rates of arrests often have higher rates of police violence, such as France, Peru, South Africa, and Uganda.⁷⁰ Climate and environmental activists are often exposed to surveillance, infiltration, harassment, threats, and assaults. In the UK, the *Spy-Cops* scandal revealed how undercover

police officers had infiltrated activist groups that were often not accused of wrongdoing. The most infamous case involved undercover officer Bob Lambert, who fathered a child with an unsuspecting activist.⁷¹ At times, states have condoned extralegal (and even obviously criminal) policing tactics. In a high-profile case in the Philippines, armed forces abducted environmental activists Jonila Castro and Jhed Tamano and tried to force them to make a false public statement admitting to being communists and terrorists. Instead, they told the public about the threats and harassment they had endured during their abduction.⁷² Around the world, including in the United States and the UK, private security companies have often been hired to help surveil or infiltrate activist groups.⁷³ In Peru, the police themselves act as a kind of private security company, as mining companies can pay the police force to provide them security and repress activists.⁷⁴

Murder of Climate Activists

The fourth and most serious kind of repression occurs when environmental activists are killed because of their activism. The NGO Global Witness conducts the best documentation of such killings, counting over 2,100 murders since 2012.⁷⁵ Most of these killings take place in resource-rich countries with high levels of foreign direct investment, including Brazil, Colombia, Mexico, and the Philippines.⁷⁶ It is nevertheless a global problem, since the killings are often connected to disputes involving corporations based in the Global North. The perpetrators of the murders vary between countries and cases, with police mostly responsible in India and Peru, armed forces in the Philippines, and hit men and landowners in Brazil.⁷⁷ Killings are often preceded by death threats and other kinds of harassment and carried out by the same actors who do the policing.⁷⁸

Public Vilification

Lastly, vilification processes—attempts to smear and discredit climate and environmental activists—feed all the forms of criminalization and repression discussed above. Politicians, media, corporations, and think tanks contribute to vilification by promulgating discourses that dehumanize activists and encourage and enable the other forms of criminalization and repression. They steer attention away from climate and ecological crises and vastly exaggerate the harm and disruption caused by activists. Swedish Prime Minister Ulf Kristersson and former Australian prime minister Scott Morrison have denounced climate activists as threats to democracy and civil liberties respectively.⁷⁹ In India and Peru, vilification of activists on social media has been followed by arrests and disappearances.⁸⁰ In the UK, some of the most high-profile and vilified activists have received the longest prison sentences, including Phoebe Plummer, who infamously threw tomato soup on the frame and casing of a Van Gogh painting, and Extinction Rebellion and Just Stop Oil co-founder Roger Hallam.⁸¹ Investigative journalists have published essays about how the same think tanks that promote the antagonization of activists have also helped draft anti-protest legislation.⁸²

An important discursive strategy in the vilification process is to separate the activists from their causes, because the causes that climate and environmental activists strive for are broadly popular with the public. Large majorities in most countries want to see bold action on climate change.⁸³ It is also easier to feel sympathy for local communities fighting against extractive industries than for the corporations who carry out the destructive extraction. Vilifying activists thus relies on convincing people who are broadly supportive of the goals of activists to nevertheless denounce the activists because of their strategies and tactics. This is achieved by separating the activism from the cause, as is often seen in media reporting. Research I helped to carry out in the Policy & Protest project shows that media reporting about Just Stop Oil in the UK was framed around criminal behavior and law and order.⁸⁴ It only rarely mentioned climate change or the oil and gas licenses that Just Stop Oil protested. This separation takes a particularly damaging form in court cases where defendants are prohibited from speaking about the climate crisis, despite this being their motivation.⁸⁵ In short, vilifying discourses are highly destructive and work in a symbiotic relationship with the very real repression of activists.

Responding to Repression

Legitimizing Climate Activism

One key response from civil society is to counteract a vilification process with a legitimization process. Politicians, NGOs, think tanks, academics, and journalists can support activists in this work. Indeed, this series and all of its contributors can be seen as part of a broader effort to legitimize climate and environmental activism and counteract problematic discourses targeting activists.

The legitimization process has two component parts. Firstly, it involves presenting climate and environmental activists as legitimate social and political actors who are fighting for the survival of civilization. One important way to do this is to avoid speaking about activism in a way that separates it from climate and environmental crises. Vilifiers often suggest that activists are selfish.⁸⁶ The role of the legitimizers is therefore to show that being an activist for a cause that most of humanity supports, and all of humanity would benefit from, is in

fact far from selfish. Rather, these activists are putting their bodies and liberty on the line for the greater good. This does not mean that legitimizers must endorse all tactics used by activists. It is perfectly possible to highlight the very worthy cause and the legitimacy of social and political actors without endorsing their tactics.

The role of the legitimizers is to show that being an activist for a cause that most of humanity supports, and all of humanity would benefit from, is far from selfish.

Secondly, the legitimization process involves highlighting, denouncing, and bearing witness to the repression and criminalization of climate and environmental activists. This is of course the mission of NGOs like Amnesty

International and Global Witness. Amnesty has long brought criminal state repression of activists to global attention as a way of protecting activists by mounting pressure on authoritarian state behavior.⁸⁷ Indeed, my very existence was made possible by Amnesty and others putting pressure on the Peruvian state in the 1960s not to execute, and then to liberate, my father.⁸⁸ Global Witness achieves its goals by mapping and telling the stories of persecuted environmental defenders.⁸⁹ In this case, choice of words is an important part of the protection. While the word “activist” is neutral in that the speaker may agree or disagree with the activist’s cause and method, “environmental defenders” leaves little room to disagree that these are important actors who ought to be protected.⁹⁰ Together, these acts of legitimization seek to create an environment that makes repression costly in terms of reputation. If this first response to repression, legitimization, is carried out by a coalition of actors who share the goals of climate and environmental activists, the following two are explicitly activist responses.

Sabotage

A second possible response to criminalization and repression is to go underground and pursue more sabotage-oriented tactics, as Noah Gordon explores in further detail in his contribution to this collection. The logic goes as follows: If nonviolent protests land people in jail for several years, then activists may as well carry out acts of sabotage that could cause greater disruption to the actors that drive climate change. One group that adopted this perspective, the UK-based Shut the System, saw some limited success trying to cut internet access to an insurance firm in London in January 2025.⁹¹ Similar undercover acts of sabotage, albeit with much lower stakes, have been intermittently carried out by Tyre Extinguishers around various cities as they deflate SUV tires with lentils.⁹² These acts of sabotage were encouraged by Andreas Malm’s book *How to Blow Up a Pipeline*, which critiqued the nonviolence of Extinction Rebellion and served as a kind of sabotage manifesto.⁹³ The book also inspired a film with the same title. However, despite the extensive attention given to Malm’s book, the film, and the small groups they have inspired, sabotage remains a rare practice. Researchers and observers should then be careful in giving it too much intellectual credibility, since it seems to be driven primarily by the sensationalism of the media and entertainment industries.

Changing Tactics

Lastly, activists in countries with quickly deteriorating protest rights will adapt to increased repression by using tactics with greater support and legitimacy, as a shield against repression. Unlike the legitimization carried out by a range of actors set out above, this last response refers specifically to social movement tactics and strategy. It means moving away from unpopular, disruptive protests toward more popular forms. Just because a state has laws, batons, and guns at its disposal to repress protest does not necessarily mean it will use them.⁹⁴ A key reason groups like Just Stop Oil have been criminalized into extinction is precisely that

they had so little legitimacy among the general population.⁹⁵ But draconian anti-protest laws cannot repress all protest equally. Since UK police were given powers to stop any demonstration that violated noise limits, all kinds of protests have continued to be noisy, but the police have only really used those powers against Just Stop Oil.⁹⁶ Hypothetically, if new draconian laws had existed in 2019 and broadly popular European youth climate strikers had blocked traffic, they would have been unlikely to receive prison sentences. Their popularity and public appeal would have acted as a shield.

There is nothing new in this lesson. Activists around the world know that it is harder to repress them if they are many and they are supported by many more. If that were not the case, there would not be protest in authoritarian settings—but there are, always have been, and always will be.

Conclusion

Across the world, state and corporate actors together have been driving a wave of criminalization and repression of climate and environmental protest. The best response is to focus on legitimacy. For social movements, that means acting in greater numbers and seeking support from sizeable minorities, if not outright majorities, of the population. Doing so makes it harder for state and corporate actors to repress activists. Broader civil society also has an important role to play in strengthening the legitimacy of activists and counteracting the vilification that they are subjected to. It can do this by connecting protests to the climate and environmental crises that spurred them and drawing attention to repression and criminalization wherever it takes place.

Broader civil society also has an important role to play in strengthening the legitimacy of activists and counteracting the vilification that they are subjected to.

This last point is the key message. Anybody who is concerned about the threat that climate change and environmental degradation pose to human civilization has an interest in defending climate and environmental activists and social movements. Criminalization processes are taking place practically everywhere, and they need to be contested everywhere. Each person has a role to play in that contestation.

In this series of articles, Carnegie scholars and contributors are analyzing varieties of climate activism from around the world, focusing on the intensification of activity both from the protesters themselves and from the authorities and forces who are the objects of their discontent.

In Iraq and Yemen, Climate Activism Requires Both Defiance and Adaptation

Issam Kayssi and Mohanad Hage Ali

In the Middle East, climate activism is often intertwined with public grievances over perceived governance failures and ongoing regional and national conflicts. Not only are Iraq and Yemen among the countries most vulnerable to climate change,⁹⁷ compounded by apparent endemic state corruption, but they have also become key arenas for the ongoing regional confrontation between Israel and Iran's axis that began in October 2023. In Iraq, for example, clashes between Iran-backed militias and U.S. and Israeli forces—a symptom of wider instability and governance failures—have enabled Türkiye and Iran to exploit the country's water resources.⁹⁸ In Yemen, Ansar Allah (commonly known as the Houthi movement) has disrupted international shipping in the Red Sea and attacked Israel, deepening the country's isolation and insecurity. Both countries also grapple with fragmented political authority: Iraq's federal structure includes a semiautonomous region, while Yemen remains divided among competing factions.

This ongoing armed conflict and political fragmentation shape the countries' experiences of climate change and how citizens respond to it. Iraq and Yemen face acute environmental crises, including soaring heat, vanishing water sources, and agricultural decline. But in the current context, climate change is not an isolated challenge—it collides with long-standing governance failures and unfavorable geopolitical shifts. Successive governments have failed to manage natural resources, invest in sustainable infrastructure, and protect vulnerable communities. In both countries, the effects of climate change have become intertwined with public discontent over perceived corruption, marginalization, and the erosion of state legitimacy.

In response, climate activism has emerged in Iraq and Yemen as a vehicle not just for ecological advocacy but also for political expression in the shadow of conflict and hegemony and as civic space shrinks. Environmental mobilization in the countries often doubles as a demand for accountability and reform, even when framed in technical or local terms. Activists and citizens navigate hostile terrain (facing repression, surveillance, or institutional collapse) and yet still organize. In Iraq, youth and civil society groups have linked environmental issues to broader protest movements challenging state corruption and militia impunity. In Yemen, where formal governance has largely broken down, environmental initiatives are sustained through informal networks, community education, and local relief efforts. These movements reflect a deepening connection between ecological survival and political voice.

Examining climate activism in these two fragile states provides insight into how environmental politics unfold under conditions of conflict and fractured governance. Rather than being marginal or apolitical, climate activism here represents broader struggles for dignity, livelihoods, and democratic participation—struggles that are increasingly central to the future of the Global South. When speaking about climate change, activists highlight a salient element of continuity with ongoing struggles against incompetent governance.

Iraq: Struggles, Strategies, and State Repression

From the drying of the Tigris and Euphrates Rivers to intensifying heat waves and saltwater intrusion in the south, Iraq faces an escalating environmental crisis that intersects with existing corruption, misgovernance, displacement, and violent repression. In the southern province of Basra, for example, increased salinity has devastated once productive palm groves and citrus orchards. In nearby Dhi Qar, the slow disappearance of the marshlands has destroyed traditional livelihoods, such as fishing and buffalo herding.⁹⁹ Almost 170,000 people in the country have been displaced because of climate-related causes as of October 2024, and desertification is costing the country roughly 250 square kilometers of arable land each year.¹⁰⁰

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In response, various types of environmental activists have begun organizing across Iraq, including some who may not necessarily identify as such. These actors include veterans of the 2019 Tishreen Uprising (which challenged entrenched corruption, sectarian politics, and foreign influence¹⁰¹), youth-led nongovernmental organizations (NGOs), scientists, heritage preservationists, and community organizers. Despite operating in a deeply repressive environment, they have become the most persistent voices advocating for environmental justice and climate adaptation in Iraq. A central theme of protests led by such actors is the demand to reestablish governance as a national priority,

particularly in areas such as public services and climate response, rather than continuing to prioritize sectarian competition and abstract anti-imperialist rhetoric, which has largely been shaped by Iranian influence in Iraq.

One well-known organization is Nature Iraq, established in 2003 to protect Iraq's unique ecosystems, especially the Mesopotamian Marshes. Another is Humat Dijlah (Tigris Defenders), a youth-led group focused on safeguarding Iraq's vital rivers from pollution, overuse, and infrastructural threats.¹⁰² Grassroots initiatives in southern Iraq have also mobilized to draw attention to poor water management, flaring from oil production sites, and the absence of serious pollution controls. Collectively, these groups have demanded better environmental legislation, the end of gas flaring, and more equitable and transparent water governance policies.

Many of today's climate activists were active participants in the 2019 protests against systemic corruption, unemployment, and lack of basic services. These young Iraqis, disillusioned by the failure of political reforms, turned their attention to climate issues, seeing environmental collapse as a symptom of Iraq's deeper governance failures. For them, clean air, potable water, and protection from extreme heat are not just ecological goals; they are rights and prerequisites for human dignity.

One key moment that illustrates this convergence of environmental and political demands came in 2018, when youth-led protests erupted in Basra following the collapse of the water system. Rising salinity and pollution in the Shatt al-Arab river had rendered the water undrinkable, leading to widespread illness. The protests quickly expanded into broader calls for political accountability, and their intensity foreshadowed the nationwide Tishreen Uprising the following year. This moment marked the crystallization of climate-driven mobilization as a form of political resistance.¹⁰³

Popular mobilization around climate-related grievances has not ceased since then. In May 2025, for instance, residents of Al-Madina, a district in northern Basra, escalated protests over the lack of clean water and deteriorating environmental conditions by shutting down the local district council building. Demonstrators cited pollution from nearby oil operations; delayed public works, such as a promised desalination plant; and the failure of local and federal authorities to respond to health risks. Security officers forcibly reopened the building, but protest leaders warned that unrest would continue unless their demands were met. As one resident put it, in reporting by Shafaq News, "Al-Madina fuels Iraq's wealth but receives nothing but neglect."¹⁰⁴ The protest reflected ongoing discontent over environmental injustice and mirrored earlier mobilizations in Basra and the southern marshes, illustrating how climate-related grievances continue to catalyze civic action.

For them, clean air, potable water, and protection from extreme heat are not just ecological goals; they are rights and prerequisites for human dignity.

Over the years, however, many Iraqi activists have pivoted toward quieter forms of advocacy. They conduct reforestation campaigns, monitor pollution, or tell personal stories from affected communities (in the hope of at least documenting the situation). Media platforms have become important tools, especially for amplifying voices from Iraq's marginalized south. Stories from displaced farmers, fishers, and marshland residents are documented and shared widely, raising awareness both inside and outside Iraq. In Basra, individual activists have focused on sharing knowledge, raising awareness through social media, and fostering networks of civil society actors, academics, and local activists.¹⁰⁵ These networks provide protective coalitions in a context where activism risks political scrutiny and personal danger. Visual artists lead cultural initiatives that document ecological degradation through storytelling and exhibitions,¹⁰⁶ subtly shaping public consciousness around Iraq's environmental crisis. In this way, activists have created a powerful narrative that links ecological degradation with economic collapse, displacement, and rights violations.¹⁰⁷ The rise of quieter advocacy is due, at least partially, to the fact that climate activism in Iraq comes at a steep price for many. The post-Tishreen crackdown dramatically shrunk civic space, and climate activists (especially those who were also politically active in 2019) are often viewed with suspicion by authorities.¹⁰⁸ This is compounded by the perception among Iraq's entrenched political and militia elites that environmentalists represent a threat to their interests, especially when their demands challenge oil-driven development or implicate the state in mismanagement. As a result, many climate activists face escalating repression, threats, and violence.

In one example, Salman Khairallah, co-founder of Humat Dijlah, was arrested and forcibly disappeared during the Tishreen protests in December 2019. He was eventually released, but continued threats forced him to flee the country.¹⁰⁹ Similarly, Jassim al-Asadi, an environmental expert known for his work protecting Iraq's southern marshes, was abducted near Baghdad in February 2023 by unidentified armed men. He was held for two weeks and reported being subjected to severe torture, including beatings and electric shocks, likely in an effort to silence his advocacy.¹¹⁰

Legal harassment is also common. Activists are routinely accused of having foreign affiliations or being backed by so-called outside agendas, charges that carry serious consequences in Iraq.¹¹¹ Raad Habib al-Assadi, the head of the Chibayish Organization for the Protection of the Marshes, has faced repeated legal and bureaucratic obstacles while attempting to organize environmental campaigns.¹¹² Activist groups often see their events shut down, funding blocked, or members surveilled and harassed by state-linked entities.¹¹³ Without institutional protection or sustainable sources of funding, even well-established organizations struggle to carry on long-term projects.

However, such work continues at both the individual and organizational levels, with environmental advocacy offering a rare opportunity to carve out civic space in an otherwise authoritarian system.¹¹⁴ Because officials sometimes perceive climate change as a technical rather than political issue, it sometimes allows for limited cooperation between activists and the government. Activists have used this ambiguity to push for reforms (however small)

and engage with international bodies in ways that might pressure the Iraqi state without provoking outright confrontation. This cooperation provides activists with a shield of legitimacy that Oscar Berglund conceptualizes in his article in this series. Tactics include lobbying for stricter emissions standards, pressing for the inclusion of environmental protection in development plans, or seeking international protection (for instance, because of UNESCO heritage status) for ecologically important areas. For example, the campaign to secure global protection for the marshlands in southern Iraq exists not only as a conservation effort but also as a lever to hold the Iraqi government accountable for environmental degradation.¹¹⁵ In addition, the launch in 2014 of Iraq's National Youth Climate Team under the Higher Youth Council speaks of a nascent, officially backed, but still limited platform seeking to engage young people in climate solutions.¹¹⁶

Nonetheless, entrenched systemic challenges continue to constrain the impact of these incremental forms of activism. Iraq's muhasasa political system,¹¹⁷ which allocates power along sectarian and elite lines outside formal institutions, often sidelines youth-led and civil society initiatives, making direct political engagement fraught. Political neglect, limited resources, and occasional intimidation further hamper efforts, highlighting the difficult context in which these quieter campaigns operate. Political backing from reform-minded individuals would increase the prevalence of institutional success. Sustaining spaces where young activists and reformists within government can build trust and jointly address systemic barriers is essential, as is the independence and accountability of youth and civil society platforms.

The situation in Iraq today illustrates how climate activism can operate simultaneously as a flashpoint and a conduit for broader civic engagement. On one hand, it can be a deeply risky endeavor. On the other, it serves as a rare opening for young Iraqis to articulate visions of dignity, rights, and a livable future. Whether through institutional engagement, quiet advocacy, or public protest, Iraq's climate activists have found ways to adapt, endure, and continue their work in the face of profound adversity.

Yemen: Activism Navigating Collapse and Conflict

Yemen faces one of the most acute climate emergencies in the world. Climate change in the country manifests in increasingly severe droughts, violent storms, desertification, and chronic water scarcity, all compounded by a decade of war and state collapse. The average Yemeni today has access to just 74 cubic meters of water per year (well below the threshold of absolute scarcity), making Yemen the most water-insecure country in the world.¹¹⁸ Temperatures are rising at twice the global average,¹¹⁹ while erratic seasonal rainfall has intensified. In July–August 2024, severe floods damaged or destroyed tens of thousands of shelters, affecting over 60,000 people. In Al-Hudaydah Governorate alone, there were thirty-one deaths, and Al-Mahwit faced home losses, crop and livestock damage, and the destruction of roads and bridges.¹²⁰

This environmental degradation is closely intertwined with political dysfunction. The country's already fragile, war-battered water infrastructure can no longer provide for the population. Over half of Yemen's land is classified as desert; decades of groundwater overextraction (including for qat fields), deforestation, and weak regulation have intensified desertification and water scarcity.¹²¹ With agriculture and herding providing the backbone of rural livelihoods, ecological degradation is deepening food insecurity and economic precarity.¹²²

Local climate activism has responded to these overlapping crises of climate stress, infrastructure collapse, and institutional breakdown. Youth volunteers, civil society organizations, environmental researchers, journalists, and educators have stepped into the void left by the state, developing grassroots solutions and sounding the alarm on Yemen's climate vulnerability. One clear example came in response to the 2020 floods in Aden. After successive rounds of flooding devastated the Crater neighborhood, youth-led groups organized their own relief operations, as the government failed to offer extensive support. (Aden's Civil Defense Authority operates with just a few firefighting vehicles and has no capacity to carry out evacuations.) Lacking access to public resources, the youth-led groups solicited donations from local philanthropists to rent vacuum trucks to clear floodwaters.¹²³ During that same period, angry residents confronted officials over repeated flood damage and the failure to restore water or electricity. These reactions captured a broader truth: As climate shocks grow more severe, they intensify public frustration with states that are unable (or unwilling) to respond.

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Climate inaction is a symptom of not only war but also structural dysfunction. Yemen is divided among the Houthis in Sanaa, the internationally recognized government based in Aden, the Southern Transitional Council, and other Gulf-backed forces, including Salafist militias. Neither the internationally recognized government nor the Houthi authorities have the capacity or political will to enact or enforce green policies. Groundwater depletion, overfishing, and land degradation continue unchecked. Environmental law is outdated and unenforced, and no agency has the power to coordinate a national response. As a result, citizens and activists have had to step in, offering both practical solutions and political critique.¹²⁴

In Al-Mahra Governorate, the devastation wrought by Tropical Cyclone Tej in 2023 laid bare this institutional vacuum. Neighboring Oman mobilized shelters and evacuations in advance,¹²⁵ while in Al-Mahra the response relied heavily on humanitarian partners and local authorities amid limited national capacity.¹²⁶ Roughly 22,000 people were displaced, and the flooding destroyed infrastructure, livestock, and crops. With no disaster preparedness plans in place, communities were left to fend for themselves.¹²⁷ For activists and local observers, this episode was not simply a weather event but also a demonstration of the deadly consequences of Yemen's fragmented and under-resourced governance.

Despite these challenges, some civil society organizations and researchers are working to reframe the national conversation on climate and environmental governance. One prominent organization, Holm Akhdar for Environmental Consultancy, highlighted that more than half of Yemen's internally displaced people have been forced to adopt harmful coping mechanisms (such as selling livestock or reducing food intake) because of worsening extreme weather.¹²⁸ The group called for the establishment of a national disaster response plan and greater international engagement. Environmental researcher Maha Al-Salehi has issued similarly ambitious proposals, advocating for the revival of Yemen's suspended Water Law, modernization of irrigation techniques, and the declaration of a national climate emergency.¹²⁹ She points to the collapse of groundwater systems as a case study in institutional failure, emphasizing the lack of regulatory oversight and the disappearance of state authority.

Other experts, such as an agricultural engineer based in Aden, have explored how environmental degradation is contributing directly to violence and conflict. They link the rise in land disputes to the erosion of customary conflict resolution systems and the near-total collapse of judicial institutions.¹³⁰ Droughts and floods have blurred property boundaries, destroyed farmland, and triggered disputes over access to water. In some cases, individuals have taken up arms to defend their land against encroachment from militias or neighboring communities, illustrating how climate impacts can fuel insecurity in the absence of state protection.

In Lahij Governorate, as a 2023 ARK Group survey found, 50 percent of rural respondents saw desertification as one of the greatest threats to their communities.¹³¹ Yet these fears have not translated into regional or national policy.¹³² Filling this gap, a young generation of activists has led autonomous initiatives to educate, organize, and respond to environmental breakdown. In Taiz, a short film featured at the Women Deliver 2023 festival documented grassroots pollution control campaigns led by local women, including engineer Irtifa Amin al-Qubati.¹³³ The film captured how communities were improvising small-scale solutions to manage waste and mitigate health risks in the absence of public services. In Sanaa, youth activist Ishraq al-Suwaidi launched an educational campaign to integrate climate literacy into local schools, using monthly student competitions and interactive activities to raise awareness.¹³⁴ In Aden, activist Ithar Fare'ah spearheaded a UN project to transform organic waste into compost, promoting both food security and sustainable agriculture.¹³⁵

Other responses have taken shape in the media sector. In 2023, the Climate and Energy Transition Journalism Network was launched by the Studies & Economic Media Center,¹³⁶ headquartered in Taiz, to strengthen local reporting on environmental issues.¹³⁷ The network connects journalists, researchers, and experts to raise public awareness and document environmental harms. Its founder, Mustafa Nasr, describes the effort as a way to “build local capacity for climate adaptation.” Members of the network, including journalist Ihab Zidan, have highlighted the lack of training

Filling this gap, a young generation of activists has led autonomous initiatives to educate, organize, and respond to environmental breakdown.

in environmental reporting as a major obstacle to public engagement. Though limited in scale, initiatives such as these reflect how local actors collaborate in crafting solutions tailored to their contexts.

Still, the work of these activists and journalists carries risk, with environmental advocacy seen as potentially political. One member of the journalism network explained: “You always have to calculate what you’re saying . . . if the Houthis or the [Yemeni] government think it’s political, you could be in trouble.”¹³⁸ Surveillance, harassment, or even violence are not uncommon, especially when activists speak out about state negligence or environmental destruction in contested areas.

In one interesting example that came with the shield of legitimacy, local authorities in 2023 held a conference on climate-related challenges and solutions. Hosted in Mukalla, it brought together representatives from Yemen’s environmental protection authorities, agriculture and water resources offices, and local and international organizations from the southern governorates of Hadramawt, Al-Mahra, and Shabwa. They emphasized the lack of operational budgets, technical personnel, and coordination between agencies and developed a set of concrete recommendations.¹³⁹ Although not led by grassroots activists, these incremental, technocratic efforts reflect a quieter form of advocacy rooted in local governance that seeks to strengthen institutional responses to Yemen’s escalating climate threats.

Years of war have drained state revenues, and international donors remain hesitant to engage meaningfully with Yemen’s environmental collapse, focusing instead on short-term humanitarian relief. In this context, Yemeni climate activism functions both as a form of resistance and of resilience. It addresses immediate environmental harms while also restoring a sense of community agency. Whether in the classroom, on farms, or through emergency flood response, activists are filling the void left by state neglect. Their work is grounded in the daily realities of conflict and climate crisis.

Conclusion

Iraq and Yemen show how climate-induced degradation interacts with deep governance failures and protracted instability, compounding public suffering and fueling wider discontent. Despite these challenges, citizens continue to mobilize. Their responses reveal how climate activism can become a vehicle for broader demands for justice, accountability, and reform.

In Iraq, environmental concerns have become increasingly central to protest politics, especially in the post-2018 period. Activists have linked salinized (and poisoned) water, deadly summer heat, and mismanaged resources to the failures of a political system shaped by sectarian clientelism and militia dominance. In Yemen, where formal activism appears almost impossible in much of the country, a quieter but equally political form of environmentalism has emerged through community-based efforts to preserve agriculture,

manage water, and adapt to shifting weather patterns. What ties these two contexts together is the way that the climate crisis interacts with degraded forms of political authority. In both countries, those most affected by climate change are also those least able to influence how resources are managed or how decisions are made. Their vulnerability is not only ecological but political. And yet, this activism (whether in the form of public protests, grassroots organizing, or local resilience initiatives) suggests that meaningful mobilization can emerge even in the harshest of conditions.

Looking at Iraq and Yemen together challenges assumptions about where and how climate activism takes shape, even if this activism does not match the organizational level of established democracies. In other words, climate activism may not always be confined to strong states or liberal democracies, nor does it always take the form of visible mass movements. Instead, it can arise where governance is fragmented, where risk is highest, and where the stakes (access to water, health, and survival) are most immediate. In these contexts, activism becomes a way to contest not only ecological harm but also the structures of violence and neglect that allow it to persist.

Women and Climate Activism in Morocco and Tunisia

Sarah Yerkes and Natalie Triche

The Maghreb countries—Algeria, Morocco, and Tunisia—are facing a variety of acute climate change challenges. Water scarcity is on the rise, and dams are drying: On average, Al Massira Dam in central Morocco holds only 3 percent of the water it did nine years ago.¹⁴⁰ The Maghreb region’s coastlines are receding faster than nearly all others globally, and within the region, Tunisia’s 1,300-kilometer coastline is eroding the fastest.¹⁴¹ Temperatures are rising: Since 1950, Algeria’s mean temperature has steadily increased nearly every year.¹⁴² Climate change is also impacting traditions across the Maghreb. Farming methods have changed because of land desertification caused by cash crops and prolonged, persistent drought.¹⁴³ Government policies attempting to limit water usage have occasionally shut down North African bathhouses, called hammam in Arabic, that play significant cultural roles, including in pre-wedding traditions and religious cleansing rituals.¹⁴⁴ Migration induced by climate change is also on the rise, with the World Bank predicting that North Africa will have up to 19 million internal climate migrants by 2050.¹⁴⁵

These climate consequences disproportionately impact the women of the Maghreb because women bear the burden of domestic labor, including cooking, cleaning, and fetching water—activities impacted greatly by a changing climate. Furthermore, women in the Maghreb are significant contributors to the agricultural sector and make up over a quarter of agricultural workers¹⁴⁶ in an industry facing acute and urgent climate challenges.

Recognizing the crucial role women play in building resilience, each Maghreb country has tasked a woman to lead governmental efforts to mitigate climate change: Leila Rachel Benali is the minister of energy transition and sustainable development in Morocco, Fazia Dahleb is the minister of environment and renewable energy in Algeria, and Leila Chikhaoui is the minister of the environment and sustainable development in Tunisia. Nevertheless, women’s voices are often underrepresented in discussions around local climate adaptation

and mitigation. In Morocco and Tunisia, several civil society organizations are attempting to reverse this trend. They pay homage to the fact that women are disproportionately disadvantaged by climate change.¹⁴⁷ The intersection of gender and climate is worth policymakers' attention, as women's knowledge and experiences can be leveraged to develop strategies to mitigate the harmful consequences of climate change, including the aggravation of existing gender inequalities.

The Gendered Impact of Climate Change in the Maghreb

Gender roles in the Maghreb prescribe men and women to certain vocations and duties. The key climate-related challenges in the region—water scarcity, desertification, and extreme weather—primarily impact domains for which women are responsible. The tasks of laundry, cooking, cleaning, and childcare in most Maghreb homes fall to women. In rural farming communities, women are overwhelmed with work requiring water, arable land, and moderate temperatures.¹⁴⁸ Demand for female labor coupled with male control over the flow of money into households in rural provinces puts women in an incredibly vulnerable position. Climate change exacerbates such vulnerabilities.

Women in the Maghreb have engaged in activism around climate change for several years; however, their efforts are often either ignored by local and national officials or disconnected from their country's broader feminist movement. While some efforts aim to connect feminist climate activists who advocate for gender-sensitive climate policies, these efforts have proven to be largely inconsistent and ineffective.¹⁴⁹ There has been a great disconnect between climate activism and gender activism, despite the obvious interplay of the two issues. However, in both Morocco and Tunisia, there are examples of climate activism and gender activism coming together and working in tandem.

Morocco: Despite Occasional Protests, Climate Change and Gender Remain Disconnected

Almost a decade of drought has threatened Morocco's agricultural and livestock industries greatly. For the first time during his more than two decades in power, King Mohammed VI canceled the 2025 Eid al-Adha festivities, which typically involve the sacrifice of a sheep. The minister of Islamic affairs cited the drought-induced lack of livestock and climate change's overall strain on the economy as reasons for canceling the important religious holiday, revealing how pervasive climate change's impact is on Moroccan traditions.¹⁵⁰

Despite Morocco's image as one of the most climate-prepared countries in the world, adaptation programs are facing implementation challenges.¹⁵¹ Protests have cropped up as drought and climate change impact people's lives and as Moroccans feel dissatisfied with the policies of their government.¹⁵² Although the gender and climate activism movements have largely failed to recognize their shared interests, women have joined the climate movement and elevated their gender or gendered perspectives within the climate space. In the case of protest, women have drawn explicitly on their gender to justify their activism.

Over several months in 2024, residents of Figuig, a small town along the border with Algeria in central Morocco, protested a national water management plan that was intended to begin that year. The National Drinking Water Supply and Irrigation Program aimed to strengthen the supply of drinking water and ensure water security.¹⁵³ It would have transferred control over water systems from individual towns to a regional agency.¹⁵⁴ Water management in Morocco is steeped in tradition, with towns such as Figuig using centuries-old canal systems. Facing a threat to their traditions and anxious about a change in control, the residents of Figuig took to the streets. Women organized a protest on International Women's Day in support of the movement aiming to maintain local control.¹⁵⁵ This example illustrates a broader trend: Women are key participants in protests regarding issues related to water scarcity. Simultaneously, such gendered protests around climate change issues remain uncommon.

The fact that women are disproportionately disadvantaged by water scarcity's impacts on the agricultural industry helps explain their involvement in water scarcity activism. For instance, watermelon was introduced to rural, traditionally grazing lands around 2008, when the Moroccan government began assisting with irrigation.¹⁵⁶ A popular cash crop, watermelon has exacerbated water scarcity because of its high water demand. As lands have dried, rendering farming difficult and not financially prosperous, men have migrated to cities such as Rabat and Casablanca to seek work.

While men are gone, women take on additional farming responsibilities and simultaneously care for their families.¹⁵⁷ A gender scientist in a Moroccan agricultural organization said that "women, mainly because of their social responsibilities, are unable to use the coping mechanism of out-migration."¹⁵⁸ Despite women's workload increasing, "policies are not catching up," said the gender scientist.¹⁵⁹ Women only receive assistance from the government and nongovernmental organizations (NGOs) in very traditional industries, such as soap and carpet making.

Even when policies protecting women's rights exist, gender norms prevent Moroccan women from exercising their rights, most notably in the case of land ownership. Without owning land, the gender scientist indicated, women will not be able to make decisions to adopt climate-conscious irrigation methods. In the Middle East and North Africa generally, women's land ownership is the lowest in the world at only 5 percent of ownership.¹⁶⁰ Despite a successful melkinisation, a privatization of collective lands campaign led by feminist NGOs to grant women land ownership in Morocco in 2019, cultural gender norms have limited the implementation and scope, excluding climate change issues from the picture.¹⁶¹

Although not always explicitly gender focused, NGOs across Morocco work to create solutions for those who are impacted by climate change, especially women. Youth for Climate Morocco, one of the most prominent NGOs in the country working on climate change and whose board of ten has nine women, uses inclusive activism to improve the ways Morocco responds to climate challenges.¹⁶² Co-founder Fatna Ikrame explained:

Women are key participants in protests regarding issues related to water scarcity.

“Gender inclusivity is central to our mission. We intentionally create spaces for women and girls to lead, share their stories, and contribute to climate solutions. From training programs and community dialogues to national campaigns, we ensure that women are not just participants but active decision-makers.”¹⁶³

By raising women’s voices, the organization contributes to developing solutions to Moroccan climate issues that have long harmed women. Ikrame argues that “climate change has a distinctly gendered impact in Morocco,”¹⁶⁴ thus climate policy must consider gender. She pointed to the specific ways women are impacted:

“[Women are responsible for] managing household resources like water, food, and energy. As climate change intensifies . . . women’s daily responsibilities become significantly harder. . . . In regions experiencing water scarcity, women and girls are forced to walk longer distances to collect water, which not only affects their health but also limits their access to education and income-generating activities.”¹⁶⁵

Ikrame reveals exactly why a gendered lens in the climate space is vital: The burden of needing to handle climate change’s effects prevents women from actualizing their basic rights, including to education and health. By considering the cultural expectation that women be responsible for daily tasks requiring natural resources, Moroccan activists can push for policies that prevent women from experiencing disproportionate harm from climate change.

Tunisia: A Strong Foundation of Activism but a Lack of Results

Like other Maghreb countries, Tunisia is already experiencing several impacts of climate change, including rising sea levels and changing weather patterns. Climate change has also contributed to a multiyear drought and a water crisis that some experts date back to the 1990s.¹⁶⁶

As in Morocco, water scarcity has a disproportionate impact on women, who are traditionally responsible for water collection and food preparation. As one Tunisian woman put it, “Fetching water, once a routine task, has become arduous due to environmental changes. We spend hours seeking clean water sources, affecting our overall well-being.”¹⁶⁷ Access to water is not only a necessity for Tunisian women but also a right guaranteed in the constitution. Article 48 of the 2022 constitution states that “the State must provide potable water to everyone equally, and it must preserve water resources for future generations.”¹⁶⁸ However, in practice, the Tunisian state is increasingly failing to meet its obligation to provide access to water for women in particular.¹⁶⁹ This has led to protests in some areas, highlighting the intersection between climate activism and rights-based activism. A further challenge accompanies women on their way to access water: Development agencies have reported that women face “harassment and sexual assault” on their way to water standpipes.¹⁷⁰

Women also take on a disproportionate amount of agricultural work, again echoing issues in Morocco. Women in Tunisia make up 70 percent of the agricultural workforce, compared to only 8 percent of the total working population.¹⁷¹ Over time, women have also taken on more traditionally male responsibilities in the agricultural sector, including in irrigation, livestock grazing, and buying and selling in markets, in addition to their traditional workload, further increasing their exposure to climate-related challenges.¹⁷² Yet women have little access to resources and training to help adapt their agricultural work to the changing climate or address the negative impacts on their lives. This is due, at least partially, to the fact that only 5 percent of women farmers own land.¹⁷³

Tunisian climate activism has struggled to address these problems. Beginning with the Arab Spring protests in 2010 and 2011, Tunisian civil society has been globally lauded for its advocacy for change. However, despite a strong civic infrastructure and large amounts of foreign assistance to support Tunisian civil society efforts between 2011 and 2021, “civil society actors have consistently struggled to put environmental issues on the national agenda,” according to a report from the Center for Strategic and International Studies.¹⁷⁴ No major climate activism movement emerged in the post-2011 period, and under President Kais Saied, the civic sphere is becoming increasingly restricted. While there is more space for climate activists to operate in Tunisia than other types of activists (such as human rights and prodemocracy groups), the entire civic space is under threat because of a combination of state repression and donor withdrawal.¹⁷⁵

While there has been an uptick in protests related to water scarcity in both rural and urban areas,¹⁷⁶ the number of protesters has been quite small. This is especially true in the ecofeminist space, where few organizations have taken on climate from a gendered or intersectional perspective. Although gender-based climate activism grew in Tunisia following the negotiation of the 2015 Paris Agreement on climate change, which highlighted the importance of addressing gender in climate action on a global scale, a strong gender-based climate movement has not yet emerged in the country.

There are, however, some success stories of feminist climate activism in Tunisia. One female farmer started a women’s farmers group in 2016 that has grown to more than 200 members who help each other with technical training and promote each other’s agricultural products.¹⁷⁷ The founder, Rim Ben Soud, explains that rural women are “at the front-lines of the battle against climate change, social injustice and a patriarchal society.”¹⁷⁸

Another example is the Global Water Project’s pilot in Beja, Tunisia, which addressed climate change from a “gender transformative approach.” The project developed a working group, including representatives from civil society and the local and national governments, whose goal was to create a gender action plan. Participants worked on capacity building; awareness around gender, water security, and climate change; and implementation at the local level. For example, they had trainings about the legal system related to both gender equality and the right to water to help them better advocate for their rights and inform others of their rights.¹⁷⁹

But these positive examples belie a situation where climate activists are operating primarily at a small scale with little interaction across groups. Climate activists often form ad hoc partnerships that are short-lived and can be donor-dependent. Furthermore, there is a lack of coordination between feminist NGOs in Tunisia and climate activists.

Conclusion

Morocco and Tunisia present two similar landscapes of climate activism and gender activism. Their differing governance models—Morocco a constitutional monarchy and Tunisia a republic—result in differing approaches to climate adaptation policy. But women in both countries experience the disproportionate impacts of climate change. Morocco's civic space is currently much more free than Tunisia's because of significant democratic backsliding in the republic. But Tunisia's historic protection of women's rights provides a strong foundation for climate activism to intersect with gender activism. The recent focus in Morocco on land rights for women and the ongoing revisions to Morocco's family law, which governs women's rights, present the same opportunities in the kingdom.

To adapt climate policies in a way that pays tribute to women's experiences, the governments of Tunisia and Morocco should go beyond appointing women to lead their energy ministries. The governments could incorporate the ideas of women from across the country—particularly those hailing from rural backgrounds (who help feed the entire countries with their farms)—into their water policies. Furthermore, a government-led campaign to educate both men and women in rural areas regarding their rights to education, water, and safety would benefit existing climate adaptation programs. In both countries, expanding women's land ownership could allow women a greater say in how their households adapt to the consequences of climate change, thus helping to mitigate the disproportionate harms that women experience.

At the civic level, there is space to improve climate activism so that it has real benefit for women. Currently there is a disconnect between the work of climate activists and that of gender activists in the Maghreb. Marrying these activists' efforts would make their activism more effective. Better connecting the networks of existing climate activists within the Maghreb and outside the region could also improve the climate movement in Morocco and Tunisia. By joining with organizations from outside of their own contexts, all activists could learn lessons and tools for developing resilient climate policies that will ultimately help women reduce the undue burden of climate change.

In this series of articles, Carnegie scholars and contributors are analyzing varieties of climate activism from around the world, focusing on the intensification of activity both from the protesters themselves and from the authorities and forces who are the objects of their discontent.

Backlash Against Carbon Pricing in Australia and Canada

Jasmin Logg-Scarvell

Backlash is rising against climate policies in the West: Consider farmers' pushback against the European Green Deal, Yellow Vests protests against fuel taxes in France, and U.S. President Donald Trump's administration's stance on environmental laws. This backlash—widespread, sudden countermobilization against a policy—can arise from a combination of economic, social, or practical grievances and threatens the ambition and stability of climate policy.¹⁸⁰ One type of policy in particular, carbon pricing (which places a monetary cost on carbon emissions to encourage polluters to reduce their greenhouse gas output), is favored by Western governments because it is seen as the most efficient way to reduce emissions. Yet, carbon pricing also seems to be at particular risk of backlash due to its perceived unfairness, coerciveness, and association with elites.¹⁸¹ The puzzling contradiction between government preferences for carbon pricing and its high risk of backlash warrants analysis, as this could inform strategies for those seeking to promote pro-climate policies.

This chapter examines two prominent cases of carbon pricing backlash: Australia and Canada. The carbon pricing mechanism (CPM) introduced in Australia in 2011 faced strong conservative party and public opposition, leading to its repeal in 2013 and a decade of policy instability. Canada's two-part carbon pricing scheme, starting in 2018, encountered persistent pushback from conservative politicians and grassroots movements, resulting in its partial cessation in 2025. These cases demonstrate how carbon pricing implementation faced similar opposition (both led by elites, who spurred public discontent), but it unfolded differently due to unique national characteristics. A comparative analysis offers valuable, albeit sobering, insights into the challenges of ambitious climate policy in Western democracies.

Earlier in this series, Issam Kayssi and Mohanad Hage Ali analyzed climate activism in Iraq and Yemen, two countries where governance is fragmented and climate risk is most immediate. Their analysis highlights how civil society actors are representing direct public grievances and, as much as politically possible, trying to engage the state by relaying popular concerns. This is a contrast to the centrality of elite disputes in Western climate policymaking, where both pro- and anti-climate elites operate largely through formal institutional channels to drive the politics of carbon pricing, though with varied relationships to grassroots efforts.

Indeed, this article first unpacks how pushback against national-level carbon pricing emerged in each case, in both bottom-up and top-down ways. It explores the resilience of climate activism in the face of sustained opposition, including not just overt but also covert strategies employed by pro-climate actors to defend carbon pricing and advocate for greater climate policy ambition. Finally, it identifies common themes and unique differences contributing to backlash and, ultimately, policy failure in each case. While these failures raise questions about the viability of coercive climate mitigation policies, the sometimes-hidden battles involved still hold lessons for other pro-climate actors facing similar challenges.

Case Study: Australia

Australia's first national-level carbon pricing scheme, the CPM, began in 2012.¹⁸² A previous attempt at carbon pricing had failed to gain parliamentary support due to opposition from parties on both the left and right: The Australian Greens argued the policy was not ambitious enough, and the Liberal Party and the National Party contended it would hurt the economy.¹⁸³ This meant the CPM's introduction was met with immediate and strong pushback, occurring within an already politically divided landscape.

Backlash against Australia's carbon price manifested in interconnected top-down and bottom-up ways. From the top, conservative political elites, led by Liberal Party leader Tony Abbott, intensely criticized the CPM. Abbott campaigned to "axe the tax"¹⁸⁴ and made a "blood oath"¹⁸⁵ to immediately repeal the "great big new tax on everything"¹⁸⁶ if elected in 2013. After the conservatives were elected and repealed the CPM, climate action remained a political wedge issue, even within conservative ranks. The far right thwarted any carbon-pricing-like policies, even when proposed by their own leadership.¹⁸⁷ From the bottom, backlash emerged through protests and social media, often accentuated and steered by elites. This included heated public rallies, strong criticism from right-wing media figures, and industry-led lobbying campaigns.¹⁸⁸ Civic-level backlash peaked before the 2013 election, after which climate policy divisiveness largely remained in the political sphere.

Pushback against Australia's carbon price was driven by political, economic, and social factors. Given Australia's resource-intensive economy, fossil fuel interests and powerful lobby groups like the Business Council of Australia and Minerals Council of Australia actively fueled this opposition.¹⁸⁹ Their ties to both right-wing neoliberal and left-wing working-class

interests meant that neither political side could ignore industry concerns about the CPM's economic impact.¹⁹⁰ However, their strong opposition was primarily voiced through formal stakeholder consultations. In contrast, conservative political elites strategically mobilized more volatile public opposition through misleading arguments about the CPM's impact on everyday Australians. Abbott claimed it would wipe the steelmaking town of Whyalla off the map,¹⁹¹ and National Party leader Barnaby Joyce warned of a \$100 leg of lamb.¹⁹² By framing the CPM as a broken promise by then prime minister and Labor Party leader Julia Gillard, these elites also exploited existing distrust in government and entrenched misogyny to mobilize a small but vocal segment of the public.¹⁹³ These efforts culminated in 2011, with protests erupting in many state capital cities. Protesters were drawn from far-right members of the public, heavy industry (for example, trucking associations), and leading conservative shock jock radio broadcasters and elites. This so-called Convoy of No Confidence movement converged on Canberra, with thousands attending a rally outside Parliament House on August 22, 2011. Conservative elites such as Abbott, Joyce, deputy opposition and National leader Warren Truss, and shock jock Alan Jones made speeches against a backdrop of visceral protester placards (for example, "Ditch the Witch" and "JuLIAR—Bob Brown's Bitch" [Brown was the Greens Party leader]).¹⁹⁴ Smaller protests against the "toxic tax"¹⁹⁵ occurred when the CPM began in 2012, but the primary locus of opposition subsequently shifted back to the political sphere as the next federal election approached.

In response to the backlash, a broad coalition of pro-climate actors, including government politicians and officials, academics, and youth, defended carbon pricing in Australia. The Labor government attempted to mitigate pushback through policy design, compromises, and amendments. This included providing generous industry compensation, income tax cuts, and energy bill relief for vulnerable households, as well as trying to link the scheme to a lower, floating EU carbon price.¹⁹⁶ However, their failure to explicitly connect such benefits to carbon pricing revenue meant these efforts did not alleviate public concerns,¹⁹⁷ and in fact they fueled ongoing criticisms that the scheme gave industry too many concessions.¹⁹⁸ Academics and some think tanks advocated for the CPM through established channels, producing models and presentations to evidence its effectiveness.¹⁹⁹ Meanwhile, university students engaged in more activist methods, such as holding a protest during parliamentary question time where they unveiled a banner painted on their bodies proclaiming the CPM a "GR8 big new opportunity."²⁰⁰

In the unstable period of conservative government following the CPM's repeal, pro-climate actors inside and outside government continued to push for greater action. This involved both grassroots campaigns—such as Stop Adani, which sought to halt the development of a new coal mine due to concerns over its negative climate, ecosystem, and land right impacts—and participation in global movements such as the school strike for climate.²⁰¹

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Over the subsequent decade of conservative leadership, Australia's climate policy appeared increasingly unambitious. Events like the catastrophic 2019–2020 bushfires (coupled with the prime minister's decision to be in Hawaii at the time) further intensified domestic criticism of the conservative government's inaction on climate change.²⁰²

However, some pro-climate activism, particularly within the government, operated behind the scenes to subtly defend and expand climate policy. These covert, incremental efforts increased after the CPM was repealed. Some focused on promoting alternative policies with climate co-benefits but less risk of backlash, such as funding for hydrogen or renewable innovation.²⁰³ Others quietly laid the groundwork for a new carbon market through the Safeguard Mechanism. This mechanism, which set emissions baselines for large emitters, was initially left unused due to backlash concerns, but it stood ready to be strengthened when political conditions were favorable.²⁰⁴ It was not until a Labor government came to power in 2022 that the Safeguard Mechanism could be strengthened to become Australia's leading climate policy.²⁰⁵ Reflections on these times show that despite (and often because of) ongoing opposition to carbon pricing, government actors in particular reverted to more covert advocacy for climate action.

Case Study: Canada

Canada's Greenhouse Gas Pollution Pricing Act (GGPPA), passed in 2018, established a national carbon pricing backstop (starting in 2019) that kicked in when provincial schemes were insufficient.²⁰⁶ It comprised two parts: a consumer fuel charge (often called the "carbon tax") and an industrial pricing system based on emissions intensity.²⁰⁷ The scheme was developed during a rare period of pro-climate political alignment between the federal government and provinces. However, this alignment soon deteriorated, leading to significant provincial pushback against the GGPPA.²⁰⁸

Like in Australia, the backlash climate activism experienced in Canada emerged in an interlinked top-down and bottom-up manner. Interestingly, this opposition mostly targeted the consumer fuel charge (the carbon tax) and not the industrial system, which most big businesses came to accept. From the top, conservative political elites at both the national and provincial levels united against the consumer charge. The governments of Ontario and Alberta not only rejected the federal scheme but also rapidly dismantled complementary provincial policies from previous governments.²⁰⁹ Provinces' formal opposition culminated in a legal challenge to the carbon tax's constitutionality. At the civic level, public protests and other forms of mobilization were concentrated in key provinces and often stoked by conservative elites who opposed the tax. Protests inspired by France's Yellow Vests movement coalesced in late 2018 into the United We Roll convoy. Protesters lined highways, chanting "no surrender" and "resist" in opposition to the carbon tax (alongside broader grievances including delays in building oil pipelines and the Liberal government's relatively open immigration policy).²¹⁰

Despite the Supreme Court ruling carbon pricing constitutional in 2021,²¹¹ public opposition persisted. Small but vocal “axe the tax” protests against annual price increases caused significant disruption to highway and border traffic, especially in 2023 and 2024.²¹² National conservative leaders Andrew Scheer and Pierre Poilievre strongly championed the axe the tax campaign, and provincial elites (notably the premiers of Alberta, New Brunswick, and Saskatchewan) petitioned then prime minister Justin Trudeau about the carbon price’s impact on inflation and living costs.²¹³ The ideological and regional divide over carbon pricing only intensified over time. In late 2024, a leadership crisis within the Liberal Party government, driven by economic management concerns including the perceived costs of the carbon tax, culminated in Trudeau’s resignation.²¹⁴ The incoming Liberal leader, Mark Carney, deemed the consumer charge untenable, and it was quietly ceased in April 2025.²¹⁵ The era of assumed dominance for economy-wide carbon pricing has ended in Canada, with the country’s remaining targeted industrial scheme now more closely resembling Australia’s Safeguard Mechanism.

Top-down backlash in Canada exploited various social, political, and economic tensions. Political elites, especially provincial leaders, significantly shaped a frequently misleading narrative against carbon pricing. This narrative was strongly tied to public concerns about the cost of living, with conservative elites regularly labeling the GGPPA a “job-killing carbon tax.”²¹⁶ Scheer staged a social media campaign at gas pumps, urging people to fill up before the consumer charge’s first price rise and claiming the GGPPA would raise the cost of “everything from driving your kids to school, to heating your home, to your groceries.”²¹⁷ In Ontario, Premier Doug Ford repeatedly blamed the GGPPA for economic pressures, and his energy minister stated it “makes life more unaffordable and hits the wallets of Ontario families.”²¹⁸ Ford echoed that the tax would “drain resources from our police, firefighters, and paramedics.”²¹⁹ Ford even mandated gas pump stickers that erroneously claimed the GGPPA added 4.4 cents per liter to gas prices.²²⁰

This rhetoric exacerbated existing social, cultural, and economic regional divides in Canada. Residents in fossil-rich provinces (such as Alberta and Saskatchewan) and manufacturing-heavy provinces (such as Ontario) felt the carbon tax would disproportionately impact their cost of living compared to hydropower-rich provinces (such as Quebec and British Columbia).²²¹ The escalation of conflict to the Supreme Court amplified the link between carbon pricing opposition and provincial autonomy concerns. Even Quebec, a traditionally pro-climate province with its own carbon pricing scheme, intervened in the court case to support the opposition, demonstrating how strong concerns about sovereignty can override other differences and create unlikely alliances against climate action.²²²

Political elites, especially provincial leaders, significantly shaped a frequently misleading narrative against carbon pricing, strongly tied to public concerns about the cost of living.

Pro-climate elites responded to this well-anticipated backlash through various overt and covert strategies. Overtly, the government designed policies with long lead times and explicit benefits and compensation to mitigate pushback. Government bodies and key think tanks also presented modeling and analysis that projected carbon pricing to be the least-costly policy option.²²³ Behind-the-scenes efforts included advocating for an emissions intensity scheme (rather than a direct carbon tax) to alleviate industrial competitiveness concerns, and continuous reforms to how carbon pricing revenue rebates were paid out to improve public awareness of the scheme's benefits.²²⁴ However, unlike the minor bottom-up activism seen in Australia, no specific grassroots support or defense of carbon pricing emerged. While many Canadians readily advocated for more climate ambition and participated in general pro-climate protests, they also remained divided on carbon pricing.²²⁵ This indicates that while pro-carbon pricing advocacy persisted, it largely remained within the formal and political realms.

Lessons Learned: Countering Backlash Against Carbon Pricing

Australia and Canada both experienced carbon pricing backlash spearheaded by conservative elites using strikingly similar rhetoric. Slogans like “axe the tax” and emphases on cost-of-living impacts effectively mobilized concentrated yet vocal citizen groups who felt unfairly targeted by carbon pricing. While some elites may have genuinely shared these concerns, the highly polarized nature of the opposition in both countries suggests that political gain was a primary motivation.²²⁶ A key difference between the two countries was the geographic spread of public opposition and countering pro-carbon pricing efforts. Campaigns in Australia remained national, while in Canada, opposition was regionally divided, and pro-climate efforts were largely at the national level. In both nations, pro-climate elites, rather than citizens, led the most significant, often covert, efforts to defend and advance climate policies. However, Canadian policymakers were more effective at publicly communicating the benefits of carbon pricing than their Australian counterparts, contributing to the GGPPA's relatively longer durability. These similarities and differences offer crucial lessons for future efforts to counter carbon pricing backlash.

First, effective communication is crucial in linking carbon pricing revenue to tangible benefits and thoughtfully framing these to the public, but it is insufficient alone in countering opposition. In Australia, communication failures, particularly the lack of connection between carbon pricing revenue and compensation, were likely a major factor in its scheme's collapse. Canada's system, with its more transparent and explicit revenue neutrality goals, was more immune to pushback. However, in both countries, official communication about the policy ultimately failed to overcome the policy opposition's simplistic, often misleading, and emotionally charged messages about negative impacts. This is partly due to the inherent difficulty of explaining technically complex carbon pricing and revenue mechanisms. It also suggests that rational and economic arguments alone will not secure public acceptance for ambitious climate policies, especially when the underlying premises or ideologies are contested or the policy is perceived as enacting major economic transformation. In effect, policy supporters and activists, constrained by the need

for rational, evidence-based arguments, were on an uneven playing field against opponents. Irrespective of whether they genuinely held fears and grievances, opposing elites successfully leveraged this emotional dimension. This meant rational arguments were often ignored, while irrational ones gained traction.

One way for pro-climate actors to try to level the playing field is to build and strategically differentiate coalitions of policy supporters and opponents. Canada's longer-lasting carbon pricing policy arguably benefited from policymakers explicitly segmenting potential opposition through its design. By establishing a separate industrial scheme, Canada mitigated the influence of its powerful fossil fuel industry on general and more emotive anti-carbon pricing narratives aimed at consumers. The distinct industrial scheme also more explicitly addressed industrial competitiveness than Australia's CPM did, and additional amendments were made over time to further simplify compliance and thus reduce the likelihood of industry backlash. While it may have been at the expense of policy ambition, over time, many major industrial players not only accepted but even advocated for the policy certainty Canada's scheme provided. While the industrial scheme's long-term future is not guaranteed, Canada's relative success in isolating, neutralizing, and even gaining the support of such powerful industrial stakeholders likely extended the durability of the carbon pricing policy.

Another way to tackle the uneven playing field in climate backlash activism is to understand the intricate links between top-down and bottom-up opposition. It is often difficult to discern if climate policy backlash stems from genuine citizen discontent or from strategically framed, elite-led narratives designed to appear grassroots (that is, astroturfing). The Australian and Canadian cases are perhaps exceptional because it was clear that political elites played a central role in stoking backlash, to the point where their actions were more instrumental to policy outcomes and often preceded or even triggered broader civic opposition. Yet, elites' clear role does not negate the fact that the groundswell of public fears and grievances was also genuine in both countries. Policymakers and pro-climate actors should anticipate opposition from both levels and be prepared with specific strategies. For instance, clear communication about how carbon pricing revenue is recycled (for example, through rebates or investments) can somewhat help alleviate public concerns about cost burdens. This, in turn, would make tax grab rhetoric a less salient argument against carbon pricing.

Finally, climate activists must accept that any continued or future carbon pricing attempts will likely be linked, accurately or not, to diverse societal and economic concerns. This forces a critical look at carbon pricing's feasibility in achieving the West's decarbonization goals. Directly countering misinformation is increasingly difficult in polarized political systems where fake news (or even AI-hallucinated news) proliferates.²²⁷ Policymakers and pro-climate advocates are more constrained by the rules of the game than their opponents

Canada's longer-lasting carbon pricing policy arguably benefited from policymakers explicitly segmenting potential opposition through its design

are. Yet, deviating from these rules could be seen as contributing to the erosion of values that misleading rhetoric exploits (for example, evidence-based policymaking or democratic norms). This suggests that, even in robust Western democracies, the windows of opportunity for carbon pricing, and its pace of rollout, may be far more limited than they appear.²²⁸

Canada's experience, in particular, shows that even seemingly opportune policy windows cannot fully insulate policies from future backlash. Indeed, policymakers are already realizing that carbon pricing is not the panacea that economists once presented it to be.²²⁹ Its eventual failure in both Australia and Canada in the face of backlash adds to growing evidence that Western governments cannot rely solely on hard or coercive climate mitigation policies for durable climate action, despite the strong movement of pro-climate actors asking for urgent action. Yet, carbon pricing remains a relatively common climate policy in the West, both in ideals and in practice.²³⁰ Therefore, pro-climate activists can adapt by both promoting carbon pricing's benefits—while acknowledging its imperfections—and advocating for its implementation alongside more ambitious, complementary policies. Practically, this means policymakers and activists can both design carbon pricing policies that embed backlash mitigation mechanisms (for example, revenue neutrality/rebates) and simultaneously be prepared with plans B through Z—integrated, softer, or sector-specific policies—should option A fail.

Conclusion

This article's comparison of carbon pricing backlash in Australia and Canada reveals several lessons for those seeking to mitigate climate change. First, genuine public concerns can fuel carbon pricing backlash, but these sentiments are often deliberately and strategically exploited and amplified by opportunistic elites. Pro-climate actors can anticipate opposition from both grassroots and top-down sources, recognizing that elite-led efforts can precede or even trigger broader civic unrest. Second, even well-intentioned carbon pricing policies, designed to mitigate unfair impacts and include built-in backlash mitigation mechanisms, can still succumb to pushback when economic and social contexts shift. Particular characteristics make Australia and Canada more susceptible to climate backlash: They both have two-party political systems that likely enabled greater political polarization around contentious issues, and both are relatively fossil-reliant economies with a powerful incumbent industry. However, their experiences with policy failure still underscore that advocacy for climate action must persist long after ambitious legislation is enacted.

On a more optimistic note, the covert strategies employed by some policymakers in both countries demonstrate that pro-climate actors can continue to advance climate policy ambitions, even in the face of significant backlash. Such efforts necessitate pragmatism above all else: the perfect cannot become the enemy of the good. This approach, however, raises a morally complex question for Western climate activists: In the face of the climate emergency, is a durable plan B (like Australia's Safeguard Mechanism or Canada's targeted industrial scheme) truly sufficient, or merely better than nothing?

Confronting Backlash Against Europe's Green Transition

Erin Jones and Richard Youngs

Pushback against the European Green Deal and the continent's wider climate action has been gathering momentum across Europe. This trend has attracted political and media attention as one of the most significant current developments in the European Union. The EU has recently diluted various elements of its climate change policies, including through a February 2025 omnibus law that rolled back various sustainability-related requirements for businesses.²³¹ The EU has been a frontrunner in the green transition, so this pushback against climate action—what has been termed greenlash—is of particular importance.

But the extent and nature of Europe's greenlash remain hard to pin down with precision. Some of it flows from genuinely grassroots, citizen concerns about the energy transition, while some is driven in a more top-down manner by political parties and leaders with their own sets of interests. The current greenlash is rooted in the far right but is a more extensive phenomenon present across the political spectrum, and its combination of top-down and bottom-up dynamics echoes those described in another piece in this series by Jasmin Logg-Scarvell. We explore how climate activists are responding with upgraded strategies and tactics that may yet help protect and reform the EU Green Deal. With the future of EU climate policy hanging in the balance and the world careening toward critical tipping points for climate mitigation, those who wish to advance climate action must find ways to address the multifaceted drivers of the European greenlash movement.

Bottom-Up Versus Top-Down Greenlash

There are both bottom-up and top-down strands to European greenlash, and the relationship between these twin dynamics is shifting in politically significant ways. Grassroots mobilizations against Green Deal policies have spread across Europe over the past several years, and they often go hand in hand with an opposition led by elite figures in politics, industry, and the media. While political and corporate actors have harnessed the sentiment to push their own agendas, bottom-up greenlash is also real and needs to be examined.

Farmers' protests have been the most high-profile element of greenlash. Images of farmers driving tractors through capital cities have dominated headlines, with participants demanding the rollback of environmental protection regulations that they argue threaten their livelihoods. Farmers are the most prominent and unified group mobilizing against the Green Deal, and they tend to cite concerns not only about the energy transition's affordability but also more broadly about globalism and elitism. Many are angry about cheap imports, rising production costs, and falling prices for food sales—problems they see as exacerbated by Green Deal policies.²³² Farmers also object to what they view as the closed and unaccountable nature of EU-level policymaking embodied by the Green Deal. They have not only called for the reversal of environmental policies, such as emissions regulations, but also demanded policies to address their broader grievances about the rising cost of living and the lax trading rules on imports, calling for protectionist strategies that sit uneasily with the kind of global coordination necessary to tackle climate change.²³³

Farmers' protests have won significant policy shifts from the EU, in part because they have framed their grievances in terms of very tangible and immediate crisis imperatives. Large agri-businesses and farmers also benefit from a relatively privileged position in EU decisionmaking; their protests have achieved tangible policy changes to address their grievances, to the detriment of ambitious climate action.²³⁴ In the Netherlands, for instance, farmers' protests morphed into the Farmer–Citizen Movement, a right-wing political party

that ultimately scored electoral success as a direct result of bottom-up greenlash dynamics against the Dutch government's approach to implementing the EU's nitrogen directive.²³⁵

The targets of this wider, bottom-up greenlash have most commonly been the costs, fairness, intrusiveness, and ideological underpinnings of climate policies.

Beyond the public attention given to the farmers' protests, grassroots dynamics have nourished greenlash across European society more generally. The targets of this wider, bottom-up greenlash have most commonly been the costs, fairness, intrusiveness, and ideological underpinnings of climate policies.²³⁶ The sentiment undergirding bottom-up greenlash is widespread and extends well beyond protesting farmers. It ranges from other demographics at the grassroots level to more institutionalized forms of resistance to climate action.

Some of the societal fear flows not from the climate agenda per se but more from the opaque nature of political decisionmaking. Polls show that many European citizens feel left out of the decisionmaking process and concerned that they have little chance to influence policies; notably, there is a correlation between climate skepticism and political disaffection.²³⁷ The Yellow Vests protests in France, for instance, grew out of opposition to raising carbon taxes on fuel and included a range of ordinary people from across the country, who took to the streets to protest the costs of living and French state policies more broadly. A 2025 report from the Organisation for Economic Co-operation and Development concluded that citizen trust in the green transition is still lacking, with only a minority of citizens believing their governments will make progress on reducing carbon emissions. A few European governments (such as France, Portugal, and Spain) have initiated municipal-level, green participatory budgeting to address this.²³⁸

Recently, local activism has intensified against wind farms—for example in Spain and in Italy.²³⁹ There have been protests and attacks against solar farms, too, in the UK and Italy.²⁴⁰ In Poland, thousands demonstrated against the closure of coal power plants and argued that the EU's green policies threatened their livelihoods; steel workers staged similar protests.²⁴¹ Protests against low emissions zones have spread from places like London and Oxford to cities all over Europe.²⁴² When Germany tried to require new heating systems to be more climate friendly in 2023, thousands took to the streets to march against what they called the Green Party's "heating ideology," resulting in the government diluting the law.²⁴³ And as European leaders promote critical minerals as a crucial part of the green transition, local community organizations and individuals in places like Portugal, Spain, and Serbia have begun mobilizing against these mining projects.²⁴⁴

Grassroots greenlash has increasingly fed directly into more institutionalized political movements. Coalitions between grassroots greenlash and political parties that organize against the European Green Deal and similar, national-level policies have strengthened, with climate-skeptic parties gaining traction at the polls across Europe. In France, for instance, public backlash led the National Assembly to vote to abolish low-emission zones, with critics arguing that the measure put a disproportionate burden on those who cannot afford low-polluting vehicles. Reinforcing local community greenlash dynamics, right-wing political actors campaigned on this controversy, framing such ecological protections as anti-working class.²⁴⁵

Indeed, the nexus between the civic and political spheres tends now to function more effectively on the anti-climate than the pro-climate side of EU policy debates. Environmental activists lament that fissures between the grassroots pro-climate movement and green parties are deepening. In the June 2024 EU elections, the tally of green parties' seats dropped from 71 to 53, while more climate-skeptic parties made gains across the board.²⁴⁶ As green parties have made uncomfortable compromises over the years, a gap has widened between pro-environment political leaders and their environmentalist base; in contrast, among climate skeptics, such unity has tightened.²⁴⁷

The Far Right and Beyond

Much greenlash is tightly entwined with the continent's far-right surge. Indeed, greenlash and the far right have become mutually reinforcing, each playing a major role in driving the other. European far-right parties have now incorporated opposition to climate policies as a key tenet of their political platforms. Right-wing populist leaders across Europe, such as Geert Wilders in the Netherlands and Marine Le Pen in France, have increasingly stressed their opposition to climate policies, alongside their traditional nativist ethnonationalism.²⁴⁸ In the February 2025 German elections, the Alternative for Germany (AfD) made great play of the need to resist what it termed the country's emerging "eco-dictatorship."²⁴⁹ And the presidential candidate from Poland's Law and Justice party, Karol Nawrocki, won in June 2025 after promising to call a referendum on the Green Deal.²⁵⁰ These political parties tend to fuse opposition to the Green Deal with their wider illiberalism and euroscepticism.

However, the focus on the far right's relationship with greenlash should not detract attention away from the elements of greenlash that come from other actors, such as corporations and centrist parties. The far right is only one actor mobilizing against Europe's green transition.

Businesses across Europe have been advocating for the overhaul of environmental laws that they frame as burdensome and inefficient. This narrative is part of a broader trend in the EU, away from a focus on green transition priorities and toward a focus on economic competitiveness and security, particularly as the international order corrodes. Corporate lobbying groups have spearheaded campaigns against legal protections aimed at a wide variety of environmental and social issues, in favor of competitiveness for European business.²⁵¹

Furthermore, the links are tightening between far-right institutes and the fossil fuel industry. This trend is part of what has become an increasingly multilevel European greenlash, in which different levels of action entwine with each other. In the past several years, shadowy networks have taken shape among far-right actors, online communities, populist parties, right-wing news media, and corporate actors. These networks have gained considerable influence and have become a powerful axis of the connection between bottom-up and top-down greenlash dynamics.²⁵²

Some of the trends extend to more mainstream parts of the political spectrum. The center-right European People's Party has dramatically pivoted from climate pioneer to prominent Green Deal critic. Center-right and even some centrist European politicians are now rowing in the same direction as major polluting corporations and far-right parties, even if they have not yet deepened or formalized their cooperation.²⁵³ Center-right leaders are still hesitant to work with the far right fully, but as they too turn on the Green Deal, they have formed loose cooperative arrangements on some environmental issues.²⁵⁴ This shift is coming to shape EU policies, with the European Commission adopting two omnibus packages slashing corporate due diligence and reporting requirements aimed at environmental and human rights protections.²⁵⁵ The greenlash is driving a reconfiguration of EU-level political alliances and prizing apart the decades-long, mainstream pro-European coalition.

An especially sinister dimension of greenlash is also on the rise. As both a driver and a consequence of multifaceted greenlash, governments' criminalization of environmental activists has appeared as the most alarming and aggressive form of resistance to climate action. As Oscar Berglund argues in his piece in this series,²⁵⁶ this phenomenon has emerged in Europe out of a discourse that vilifies climate activists. Powerful actors in political institutions, the media, and elsewhere have normalized such a discourse. In this sense, greenlash is contributing to a crackdown on civic freedoms across Europe, even under so-called mainstream governments. Serious instances have occurred in France, Germany, Italy, the Netherlands, Sweden, and the UK, among other states—showing that this shocking turn goes well beyond the far right, even if right-wing civic organizations have been prominent in peddling the line that climate activists are terrorists.²⁵⁷

Greenlash is driving a reconfiguration of EU-level political alliances and prizing apart the decades-long, mainstream pro-European coalition.

Climate Activism's Response

While the political tides seem to be turning against the Green Deal, grassroots climate activists are responding to the greenlash and revising their tactics. Despite the apparent momentum of attacks on green policies and the environmental movement in Europe, there is still a strong push for climate action across the continent. Greenlash has pushed many environmental activists to rethink their tactics.

Many are trying to bridge divides and build the kind of broad coalition necessary to facilitate a socially just green transition. They are focusing far more on the concerns related to the economic costs of the climate transition and democratic decisionmaking. Activists have focused on network-building and cultivating a positive vision of climate action, through initiatives like Absurd Intelligence and Speak Up, which showcase speakers and connect cultural and artistic movement leaders.²⁵⁸ Much activism is responding to greenlash concerns, even if a strong enough coalition to reenergize the Green Deal has not yet emerged in a formal way.

European citizens have continued to mobilize for climate action as greenlash has gained ground. The successes of the Extinction Rebellion (XR) and Fridays for Future mobilizations were more immediately visible in 2019 with the launch of the Green Deal, but XR has continued to grow and develop new chapters around the continent in recent years. It has organized more frequent protests, including in Brussels, explicitly targeting EU inaction and its rightward turn.²⁵⁹ When the German government cracked down on Last Generation, the group formed a follow-up project, New Generation, which broadened its mandate beyond the climate crisis to also include fighting “the alliance of the right and the rich.”²⁶⁰

The phenomenon of radical tactics such as climatage, a portmanteau of climate and sabotage explored by Noah Gordon in this series, has received much attention across Europe but still comprises only a small portion of the overall movement.²⁶¹ The A22 Network, for example, includes prominent climate activism organizations across Europe, many of which have engaged in both formal tactics like petitioning as well as more disruptive or even climatage-type tactics. Since its inception in 2022, the network has expanded from earlier members, such as Ultima Generazione in Italy and Emergency Break in Denmark, to also include groups founded just last year, such as Folk Mot Fossilmakta in Norway and Ostatnie Pokolenie in Poland. Other groups, such as Shut the System, are increasingly engaging in acts of sabotage against corporations they see as responsible for the climate crisis, as government regulation fails to restrict polluters and at times instead targets peacefully demonstrating activists.²⁶² Mainstream media tends to paint climatage and other disruptive protests in an unfavorable light, but public support for more ambitious policy to combat the climate crisis has, if anything, grown in Europe.²⁶³

Recognizing that a key political vulnerability of the Green Deal lies in the argument that it is too expensive, pro-climate civil society and political leaders have focused on the strategic redistribution of costs as one possible route to mitigate greenlash. In Spain, for instance, the government managed to close twenty-eight coal mines without suffering electorally, because it agreed to financially support the affected areas.²⁶⁴ Such redistribution represents a promising area for potential coalition-building between grassroots pro-climate groups and political actors.

Greenlash has also highlighted divisions among climate activists in Europe.

However, greenlash has also highlighted divisions among climate activists in Europe. Activists are divided on how to bridge concerns about the economy with concerns about climate change. While some seek a middle way that emphasizes the economic benefits of the green transition, others advance a more radical view that transformative system change is needed. As activism gathers force, high-profile splits and controversies have pushed groups like XR to reconsider their tactics to limit the public discontent they caused.²⁶⁵ The group Just Stop Oil, having achieved its original goal of stopping government oil and gas extraction from the North Sea, earlier this year announced its move to disband and cease disruptive tactics like throwing soup at art.²⁶⁶ These trends reflect divisions between those drawn to more radical approaches like climatage and those advocating for less controversial tactics and broader alliances behind climate action.

Greenlash has helped reinvigorate calls to make the Green Deal more democratic. While many climate activists have demanded that decisionmakers “listen to the science,” others view this as an undemocratic kind of technocratic ecocentrism that elevates scientific actors above others in the environmental decisionmaking process.²⁶⁷ Criticism against both the privileged position of science in climate action and the technocratic, top-down, and bureaucratic nature of EU decisionmaking has pushed activists to advocate for participatory democracy mechanisms. Climate assemblies have been an especially prominent method

to counter resistance and feature citizens' voices on climate issues, with varying degrees of success. A new coalition of EU civil society organizations formed in 2025 to push for more systemic citizen participation to upgrade the democratic quality of the Green Deal.²⁶⁸ This is a significant shift in activist strategy as the mass-protest, NGO, and citizen-assembly routes show some signs of coming together in efforts to counter greenlash.²⁶⁹

Conclusion

The European Green Deal hangs in the balance, and it is now more viscerally debated in EU institutions, national legislatures, and civil society than at any point since its inception. Commissioners and members of the European Parliament are split over whether to water down green mandates. Still, greenlash is not all-dominant: A new phase of climate activism entails more determination and resilience and is employing new strategies to defend EU climate action.

EU policymakers interested in pro-climate policies need to be alert to the multifaceted nature of Europe's greenlash and the need for a similarly multipronged response to it. While some greenlash comes from top-down elite interests, the depth of genuine concern among citizens should not be underestimated. Policymakers should take care not to reduce greenlash to a problem of the far right, as this framing simply adds fuel to popular frustration with current EU policymaking.

Formal EU climate policies are not yet fully harnessing the growing, bottom-up momentum behind climate action. Pro-climate activists can take lessons from the impact of climate-skeptical mobilizations in recent times. Those advocating for climate action need to fashion an activism that recasts the Green Deal as a broad, collective social project as opposed to an elite, scientific agenda. If they can frame the Green Deal as geopolitically and economically favorable, it will be more broadly accepted. Pro-climate activism and advocacy will help produce stronger climate policy if its leaders focus more on the thorny challenge of how to fairly distribute the costs of the green transition. As attention to climate justice grows alongside greenlash, more people are calling for an approach to climate action that links planetary health with tangible improvements to everyday life. The need to reshape climate policy in this more democratic fashion is the defining task of the times.²⁷⁰

In this series of articles, Carnegie scholars and contributors are analyzing varieties of climate activism from around the world, focusing on the intensification of activity both from the protesters themselves and from the authorities and forces who are the objects of their discontent.

The Paradox in Southeast Asia's Decarbonization Agenda

Debbra Goh

Efforts to reduce emissions, decarbonize, and mitigate global warming can often produce significant negative externalities. Whether it be resource extraction for renewable energy technologies (for instance, nickel mining to build electrical vehicle batteries) or the installation of clean, firm power (such as geothermal energy), the clean energy transition disrupts local ecosystems and can disproportionately disadvantage the immediate communities where power generation or resource extraction occurs. Given the undeniably urgent need to increase clean energy production, these consequences can be overlooked or downplayed to the detriment of communities who are most impacted.

This problem presents a paradox: Reaching global decarbonization goals may come at the expense of biodiversity, ecosystem health, and principles of environmental justice. This misalignment underscores a growing tension between the modern climate movement, concerned with a societal transition away from fossil fuels, and traditional environmentalism, concerned with local conservation and environmental protection. Inherent in this conundrum is the impossibility of separating climate goals from environmental considerations: Biodiversity supports key ecosystem services and can regulate climate systems while mitigating climate risks.

Protests against climate policies or climate infrastructure development—also known as anti-climate protests—accounted for more than 45 percent of the 140 climate-related protests recorded in the Carnegie Endowment for International Peace's Climate Protest Tracker in 2024, a sharp increase from 31 percent in 2023.²⁷¹ Within that, 82 percent of the anti-climate protests in 2024 were rooted in grassroots opposition to clean energy infrastructure projects: mineral mining, hydroelectric power plants, wind turbines, and solar

farms. While some of these protests came from residents resisting such developments in their communities—a “not in my backyard” attitude—others were rooted in broader concerns about the environmental costs and biodiversity impacts of such projects. This signals a deepening tension between the decarbonization goals of the climate movement and the sociocultural, economic, and environmental costs of achieving them.

This trend is particularly evident in Southeast Asia, where grassroots protests against climate infrastructure projects are gaining steam. The Association of Southeast Asian Nations (ASEAN), which includes Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, the Philippines, Singapore, Thailand, and Vietnam, sits at a crossroads between regional ecological protection and advancing member countries’ clean energy transitions. As one of the world’s most biodiverse regions with the highest proportion of threatened species, Southeast Asia provides key ecosystem services that are under increasing pressure.²⁷² At the same time, it possesses resources critical for clean energy development. Indonesia and the Philippines, for instance, account for around 65 percent of global mined nickel production.²⁷³ ASEAN countries also collectively represent 15 percent of the global technical potential for enhanced geothermal energy generation.²⁷⁴ The region is positioned to be a major player in the clean energy transition.

As Southeast Asia rapidly urbanizes, energy demand for everything from air conditioning to global manufacturing is projected to soar. Although eight of the ten Southeast Asian countries have net zero emissions goals, fossil fuels—predominantly coal—currently supply over 70 percent of the region’s energy demand.²⁷⁵ To decouple energy growth from emissions growth, Southeast Asian countries must turn to renewable solutions. However, the same

projects meant to drive development and decarbonization are also provoking citizen unrest. As Southeast Asia turns increasingly toward clean energy, so too the region contends with growing civic backlash.

The same projects meant to drive development and decarbonization are also provoking citizen unrest.

This article examines how Southeast Asia’s pursuit of clean energy infrastructure—driven by development dreams and national climate commitments—is unfolding in areas rich in both ecological and cultural value. The case study of geothermal development in Flores, Indonesia, explores how clean energy projects are experienced by local communities as environmentally harmful and socially disruptive, resulting in a growing coalition of Indigenous communities, activists, and religious leaders opposing such projects. Protesters highlight that while climate infrastructure projects are essential for mitigating the climate crisis, their implementation risks reproducing social inequalities and ecological damage. The challenge ahead lies in ensuring that an ambitious energy transition is coupled with ecologically conscious practices and justice-oriented community considerations.

Putting the Heat on to Keep the Heat off: Geothermal Development in Indonesia

Indonesia has the world's greatest geothermal potential. A renewable form of energy production, geothermal energy uses wells drilled into the Earth's crust to pull up heat that can power turbines and generate electricity. In 2024, installed geothermal capacity in Indonesia stood at 2.68 gigawatts, second only to the 4 gigawatts of installed capacity in the United States.²⁷⁶ While Indonesia possesses substantial geothermal energy generation potential, only a fraction is used to generate energy. The National Electricity Supply Business Plan (Rencana Usaha Penyediaan Tenaga Listrik 2025–2034) targets an additional 5.2 gigawatts of installed geothermal capacity in Indonesia by 2034.²⁷⁷ Increasing geothermal energy development remains a key priority for the country, as part of its commitment to achieve net zero emissions by 2060.

In Indonesia, geothermal energy is the only renewable energy source that is statutorily regulated.²⁷⁸ One of the country's most significant geothermal policy developments was the introduction of Law Number 21 of 2014 on Geothermal Energy, which replaced Law Number 27 of 2003 on Geothermal Energy. The law recognized that geothermal is a renewable natural resource, “the potential of which is large and the utilization has not been optimum.”²⁷⁹ The new legislation identified a national goal “to promote and intensify [geothermal] utilization” to meet Indonesia's growing energy demand.

Most geothermal resources in Indonesia are located within protected and conservation forest areas. To support the expansion of geothermal energy, the 2014 legislation provided a new legal basis for geothermal activity by repealing its prior classification as a form of mining. In Indonesia, mining activities are prohibited in areas of high biodiversity and conservation value and require the issuance of specific mining licenses; geothermal and other forms of mining were thus restricted in conserved forest areas.²⁸⁰ When the 2014 law passed, geothermal activities could expand to areas including production forests, protected forests, conservation forests, and coastal waters.²⁸¹ Separating geothermal activities from existing mining restrictions thus allowed for increased resource exploitation in those areas.²⁸² While government policy has created a more favorable environment for geothermal exploration, local support for such developments has not followed suit.

Citizen Opposition to Geothermal Development in Flores, Indonesia

A key site of citizen opposition to geothermal development has been on the island of Flores in Nusa Tenggara Timur Province, which the national government designated as a “geothermal island” because of its significant geothermal resource potential. Geothermal development on the island has received international funding from the World Bank while being implemented by the Indonesian government.²⁸³ Yet the designation of Flores as a site for geothermal development came as a surprise to its residents, who were not consulted.²⁸⁴

Several proposed projects across the island—including in Wae Sano, Poco Leok, Ulumbu, and Mataloko—have been met with protests and public opposition from citizens and activist organizations that are concerned about the environmental and biodiversity hazards and the impacts on Indigenous communities and livelihoods.²⁸⁵

While geothermal energy has clear decarbonization benefits, its development often disrupts local ecosystems and communities. Constructing a geothermal power facility involves site clearing, road construction for heavy machinery, and borehole drilling. These activities can result in substantial water waste, induce seismic activity, and lead to lasting biodiversity impacts. As is the case in Indonesia, areas with high geothermal resource potential are often also areas with high endemic biodiversity, intensifying the impacts on the ecosystem.²⁸⁶ Open-loop geothermal systems, while cleaner than equivalent fossil fuel power generation, can also emit harmful hydrogen sulfide and sulfur dioxide gases, posing significant health risks to neighboring communities.²⁸⁷ Although renewable energy projects can create employment opportunities, displaced agricultural workers typically lack the education or technical skills to transition into such positions. This disconnect has led to resistance among communities that rely on traditional livelihoods.

In 2021, Wae Sano community members issued an open letter stating that they “rejected entirely the existence of the Wae Sano geothermal project,” which they argued failed to consider the social and ecological risk to locals and provided them with little direct benefits.²⁸⁸ At community meetings filmed for the 2023 documentary *Barang Panas (Hot Stuff)*, residents compared the geothermal development to resource extraction experienced under colonialism: “It’s like the colonial era. They’re taking away our economic resources. It’s like in 1945, in my opinion. This is colonialism all over again, oppressing the local communities . . . that’s what the current situation feels like. So, we do reject it.”²⁸⁹

Drawing from examples in neighboring communities, residents of Wae Sano highlighted the ecological and cultural impacts of the proposed project and argued that the development would affect their crop yields and livelihoods. They cited the geothermal power plant in Dieng, Central Java, which residents claim resulted in toxic air pollution, water contamination, water shortages, and earthquakes.²⁹⁰ The large quantities of water required in geothermal projects can also impact crop production—in the Batur District, a potato

Residents of Wae Sano highlighted the ecological and cultural impacts of the proposed project and argued that the development would affect their crop yields and livelihoods.

farmer highlighted that local farmers were “competing with a company that can pump water more extensively and quickly. If we don’t farm or fail to harvest, we can’t eat, our children can’t go to school. The losses are much greater for the local people.”²⁹¹ Moreover, opposition to the project was also rooted in the Indigenous communities’ long-standing ancestral relationships to the land. Community members feared the potential relocation would mean leaving their ancestors behind and angering them. One resident of Wae Sano said that the communities “cannot run

away [from our homes], [since] our ancestors also cannot run away . . . leaving our birthplace or homeland . . . leave[s] our ancestors behind who then search for us . . . that is why we, as one tribe, declare our rejection [of the geothermal project].”²⁹²

While the 2014 Law on Geothermal Energy reclassified geothermal as nonmining activity, many villagers continued to understand geothermal as akin to mining—part of a suite of extractivist practices that undermine their cultural and environmental well-being. In a community consultation, Wae Sano residents even called for the World Bank to stop funding the program. They argued that funding the geothermal development would be akin to “killing” residents and that World Bank involvement would be “complici[ty] in committing a crime against humanity.”²⁹³

This situation illustrates the paradox: While the geothermal project was promoted as a contribution to Indonesian—and global—climate goals, citizens were concerned about the immediate impacts on their communities and local biodiversity. The Wae Sano project was hotly contested by citizens who worried it would affect the local water supply, including the biggest lake in the area, the key source of agricultural irrigation and drinking water for residents. Wae Sano developers framed the project in the language of climate action and low-carbon development, campaigning for local support in the media and asking locals to “play an active role in overcoming the increase in earth’s temperature due to climate change by supporting the geothermal project.”²⁹⁴ In response to the language of climate action, Wae Sano residents, looking at similar geothermal projects in the region, critiqued the rhetoric as just “campaign material” that failed to consider the environmental and biodiversity effects of the project.²⁹⁵ To the residents impacted, opposition to the project stems from concerns about protecting local ways of life and biodiversity.²⁹⁶

Their opposition is especially striking given how geothermal development is touted as requiring the smallest land and resource footprint among most renewable power technologies.²⁹⁷

No clear victor has yet emerged in the push and pull over geothermal energy in Flores. Years of sustained community resistance led the World Bank to upgrade its risk rating of the environmental, social, and stakeholder impacts of the Wae Sano project, before ultimately withdrawing its financing from the project in 2023.²⁹⁸ However, in a letter announcing the withdrawal of World Bank financing from the project in Wae Sano, the regent of West Manggarai announced that Indonesia’s government would use alternative funding mechanisms to continue the project.²⁹⁹ Community members remain resolute in their opposition to the project—to them, “the main problem is not the funding, but that the project disrupts people’s lives, both environmentally and socially.”³⁰⁰

Citizen opposition is especially striking given how geothermal development is touted as requiring the smallest land and resource footprint among most renewable power technologies.

As the debate has dragged on, new voices have joined the Indigenous villagers' opposition, most notably a coalition of activists and Catholic religious leaders. In January 2025, Archbishop Paulus Budi Kleden of the Archdiocese of Ende voiced his moral opposition to geothermal development after consulting with affected constituents in Flores, and he spoke about the need to encourage resistance.³⁰¹ In March, the Archdiocese of Ende issued a pastoral letter that rejected the development of the Flores and Lembata geothermal projects. That month, Catholic priests and nuns joined hundreds of activists rallying outside of the Ministry of Energy and Mineral Resources in Jakarta as well as outside of the regent's office in Ngada Regency to demand a halt to geothermal development in Flores.³⁰² Amid growing interventions by the Catholic Church in Indonesia, the governor of East Nusa Tenggara issued a moratorium on the development of new geothermal energy projects on Flores in April 2025 and promised to review all geothermal development.³⁰³

The involvement of religious leaders symbolizes the expansion of the movement to encompass broader ideological considerations beyond immediate community concerns about direct socioeconomic and ecological costs. The inclusion of religious leaders in the coalition not only accorded the movement with greater visibility but also invoked a moral dimension of resistance to destructive practices. Indeed, one Wae Sano resident described geothermal developments as “a killer of living beings created by God,”³⁰⁴ while the open letter described the community's rejection of geothermal development as being “in the name of justice, peace and the integrity of creations.”³⁰⁵ As civic opposition to the Wae Sano geothermal project grows, coalition-building has become an essential way to effectively amplify the voices of marginalized communities most disadvantaged by climate infrastructure development.

Conclusion

The case study of Flores, Indonesia, makes clear that the clean energy transition in Southeast Asia is experienced through contradictory realities. While national governments attempt to respond to the urgent need for decarbonization, local communities often experience such projects through the fears of environmental degradation, displacement from ancestral lands, and economic marginalization. The future of climate infrastructure development in Southeast Asia must thus contend with the challenge of balancing climate goals with respecting local rights and protecting the rich biodiversity of the region. There is no panacea to this paradox. Crafting climate policy that is ambitious in its targets, centered on tenets of environmental justice, and protective of ecosystem health will require navigating significant complexities and trade-offs.

As governments respond to growing civic opposition to climate infrastructure projects, activists may also face restrictions on civic space. This is especially notable in Southeast Asia, a region marked by a diverse spectrum of regimes.³⁰⁶ Authoritarian governance practices in these nations—many of which maintain inherited colonial-era regulations³⁰⁷—limit freedom of expression or assembly.³⁰⁸ Across the region, environmental activists are particularly vulnerable. Southeast Asian countries such as the Philippines consistently

rank among the deadliest countries in the world for environmental activists, with activists subject to harassment, detention, and violence.³⁰⁹ In Wae Sano, stories have emerged of the intimidation of Indigenous protesters who oppose geothermal development. During the public consultations held in 2020 regarding the geothermal project, police and military personnel were stationed both within and outside of the meeting room, which local community members viewed as an intimidation tactic that prevented the local community from “standing up for their rights.”³¹⁰

The growing global trend of citizen protests against climate infrastructure projects—alongside the trend of criminalization elaborated in Oscar Berglund’s article³¹¹—underscores that much more has to be done to ensure that communities not only understand the global need for decarbonization but also receive localized benefits from such activities. This is especially critical in marginalized communities, where such developments risk replicating colonial histories of repression and extraction if not carefully managed. In the case of geothermal development in Southeast Asia, possible paths forward should prioritize free, prior, and informed consent. Acquiring true consent that is free from any form of coercion will help to facilitate bottom-up participation before development occurs on Indigenous territory. Moreover, such projects should consider the local communities as partners and not merely obstacles to the development. This might entail starting with smaller-scale projects that can deliver immediate, localized benefits, which can foster trust and prevent residents from feeling like they have been sacrificed for national development. Community involvement in the ownership and benefits of energy infrastructure—such as forming energy cooperatives or allowing local stakeholders to become shareholders—can further align projects with local interests and reduce their economic losses. As these benefits are realized, capacity can gradually expand, creating pathways for the community to adapt, including shifting local expertise and livelihoods. Such measures will take time but can ensure a more equitable and durable transition.

Ultimately, decarbonization is not a goal in and of itself. The fundamental mission behind climate action should be to build a livable world. Achieving this vision demands more than just deploying clean energy infrastructure at scale. It requires interrogating who benefits and who bears the costs of such processes. This might entail rethinking metrics of success beyond megawatts deployed or emissions reduced to also include how local communities are empowered. To build sustainable and enduring climate policy, decarbonization efforts must be aligned with the broader missions of environmental justice and biodiversity protection.

Northeast India's Environmental Movements Have Taken a Climate Edge

Daevan Mangalmurti

Climate change has the potential to dramatically disrupt the lives and livelihoods of millions of people in South Asia. The trends that loom largest are less predictable rainfall and hotter temperatures.³¹² To counteract these developments, governments in the region have called for international investment and aid, sought to expand the use of renewable energy, and begun planning resilience and adaptation measures with potentially major effects on their citizens' lives.³¹³

As Jasmin Logg-Scarvell detailed earlier in this series, mobilizing resources to mitigate and adapt to climate change requires governments to draw on climate science, which can be used to support state-led policies. But it can also be used to oppose them. This article examines an instance of the latter: the integration of climate science into the anti-dam movements of Northeast India. The Northeast, a topographically and culturally diverse region, has long had a fractious relationship with the rest of India. Dams represent a flashpoint that symbolizes the state's power to reshape the landscape and the lives that depend on it.

Since the late 1990s, the Indian government has presented large dams in the Northeast as an environmentally friendly and necessary means of meeting power demand.³¹⁴ For almost as long, activists have used the rhetoric of mitigation and adaptation to push back. In the process, they have blurred customary distinctions between environmental and climate-focused activism. The history of activism around such projects exemplifies how activist movements that begin with cleavages over jobs or the local environment can reorient themselves toward climate change in response to international influences and the worsening climate crisis.

This article begins with a depiction of environmentalism and dam development in India, particularly the Northeast. It then zooms in on the Lower Subansiri Hydroelectric Project (LSHEP), an especially contentious dam, to examine the role of climate science in the rhetoric used to try to stop its construction. The article concludes with a reflection on the prospects for the continued integration of climate-focused rhetoric into the region's environmental protection and conservation movements.

Environmentalism and Development in Northeast India

Indian environmentalism has three broad traditions, each associated with a socioeconomic class. Elite-led conservationist movements began before independence and emphasize protecting wild spaces, flora, and fauna. Middle-class environmentalism centers access to clean air and water, especially in urban areas. Environmentalism of the poor is produced mostly in rural contexts and involves marginalized populations staking claims to natural resources in opposition to state- and corporation-led extractive development. Sharachandra Lele, an environmental researcher, describes this third form of environmentalism as positing “that communities living in close proximity with natural resources, especially the poor, are generally predisposed towards sustainable use of resources, and the problem of degradation originates in their powerlessness in the face of takeover/ handover of these resources by/to industry in the name of development.”³¹⁵

Most environmental movements have involved an overlap of traditions. But India's large rural population and many ethnic cleavages have resulted in environmentalism of the poor being the most visible. India's most famous environmental movement, the Chipko Andolan, erupted in the 1970s when villagers in the erstwhile hill tracts of Uttar Pradesh mobilized to prevent contract logging by lowlanders and protect their own claims to forest resources.³¹⁶ Chipko is the archetypal example of sociologist Pradip Swarnakar's statement that “protest is an outcome of the livelihood crises faced by marginalized populations that are highly dependent on natural resources.”³¹⁷ Similar tensions produced the Narmada Bachao Andolan, an anti-dam movement; the Jungle Bachao Andolan, an anti-plantation movement; and many efforts to guarantee tribal access to minor forest produce.³¹⁸ These movements have all been organized around a central question: Who is more deserving of the right to extract and make use of natural resources? Is it the poor, the rural, and the marginalized or corporations, urban elites, and the centralized state?

The Northeast, as is the case with many peripheries, has often been the target of extraction—for tea, oil, and now, electricity—the benefits of which have not accrued to the grassroots.³¹⁹ As a result, the region has long played host to secessionist movements and ethnic insurgencies.³²⁰ Though lauded by India's first prime minister, Jawaharlal Nehru, as “temples of the new age,” dams in the Northeast have often been an irritant, not a balm, to these tensions.³²¹ The initial phase of dam construction in the Northeast, which took place in the 1970s, featured the construction of Ithai Dam in Manipur and Gumti Hydroelectric Project in Tripura. Both schemes resulted in flooding and displacement that dispossessed

locals of both land and ecological stability without clear resettlement measures.³²² In Assam, the Brahmaputra Board, which was established to control flooding and erosion on the eponymous river, received more public buy-in but was also criticized when it appeared distracted from local concerns.

While early dam projects in the Northeast were intended to deliver a trifecta of flood control, irrigation, and hydroelectricity, in the 1990s, dam construction moved toward exclusively generating power. This was partially a consequence of intense local and national opposition to impoundment dams.³²³ Run-of-the-river projects, the new favorite technique for dam construction, caused less displacement and were less costly than multipurpose projects. But the renewed push for hydroelectricity also reflected development imperatives. In the Brahmaputra River and its tributaries, the central government saw underused potential for hydropower that could meet power demands for swaths of the country beyond the Northeast.³²⁴ In 2003, then prime minister Atal Bihari Vajpayee “directed India to generate 50,000 megawatts of power by constructing 162 big new hydropower stations—most of them planned for the Himalayas,” according to journalist Keith Schneider.³²⁵ At one point that decade, 165 large dam projects had been proposed for the Northeast alone.³²⁶ Dam construction was to be implemented by federal entities, such as the National Hydroelectric Power Corporation (NHPC) and North Eastern Electric Power Company (NEEPCO), as well as a host of private companies, some with no prior dam-building experience, lured in by liberalization and generous governmental risk-reduction policies.³²⁷

Dams in the Northeast have often been an irritant, not a balm, to underlying tensions.

The 1998 Policy on Hydro Power Development used climate science to justify dam projects: “Hydro power is a renewable economic, non polluting and environmentally benign source of energy. . . . Hydroelectric projects have long useful life extending over 50 years and help in conserving scarce fossil fuels.”³²⁸ Through 2008, the framing of hydroelectricity as a substitute for fossil fuels took on a more environmental tinge. The foreword to the report for Hydro Power Policy 2008 by Sushilkumar Shinde, the then union power minister, showcases this shift:

While on the one hand, we are under tremendous pressure for quick capacity addition, to meet the rising demand for power, on the other hand there is a global concern on the Green House Gas (GHG) emissions by coal based power plants. In the face of this, we have to make the most appropriate choice of technology and fuel. We are blessed with a vast hydro potential in the country. This environmentally benign source of energy is capable of providing clean and environment friendly energy at affordable rates.³²⁹

Shinde’s words were echoed in the same report by Jairam Ramesh, the then union minister of state for power.

By 2019, the idea of dams as a form of climate-friendly power had advanced further. That year, the government designated dams generating more than 25 megawatts of power as sources of renewable energy to facilitate their financing.³³⁰ Commentators in the Northeast speculated that the move was also intended to help achieve India's nationally determined contribution to the Paris Agreement on climate change.³³¹ Though no large dams have received green infrastructure financing yet, the state of Arunachal Pradesh has been successful in registering small hydroelectric plants for carbon credits.³³²

More than two decades after Vajpayee's directive, only a few of the proposed projects have been completed. Many exist in a state of limbo, opposed not just by upstream populations but also by downstream communities all too aware that run-of-the-river projects often worsen water quality, produce siltation, and cause rivers to dry up.³³³ Other criticisms and pitfalls include inadequate environmental reviews, a lack of resettlement compensation, seismic risk, and generated electricity directed to faraway cities rather than development-hungry locals.³³⁴

Case Study: Climate Rhetoric and the Lower Subansiri Hydroelectric Project

The opposition movement against LSHEP began in the tradition of environmentalism of the poor. As it has continued over the past two decades, activists have used climate science to argue that the dam does not make economic or ecological sense for either the nation or the inhabitants in the immediate vicinity of the dam and its effects. Through this rhetoric, a network of rural activists, nongovernmental organizations, and scientists working in Northeast India have demonstrated that climate science does not belong solely to elites, whether environmentalist or developmentalist. The invocation of scientific authority provided activists with additional legitimacy and an internationally legible vernacular in the struggle to assert local claims to resource use over those made by the state. In the process, the need for climate adaptation was integrated into arguments for locally driven development and resource-use decisions to form a novel kind of climate activism.

The need for climate adaptation was integrated into arguments for locally driven development and resource-use decisions to form a novel kind of climate activism.

LSHEP was proposed in the 1990s as a dam with hydropower, irrigation, and flood control components on the Subansiri River, the greatest of the Brahmaputra's tributaries, near the Arunachal Pradesh–Assam border.³³⁵ By 2003, locals downstream in Assam had formed the Subansiri Bachao Samiti (Save Subansiri Committee) to oppose the dam. Environmentalists were concerned about legal violations in the dam's planning, its implications for biodiversity, neglect of community consultations, and consequences for downstream river flow.

Protests took off in 2005, when construction on the dam officially began. The initial mobilizations focused on jobs, not the environment. Activists argued that the NHPC, the dam's developer, was allocating too few jobs to locals in Lower Dhemaji district, a poorly connected part of Assam sandwiched between the north bank of the Brahmaputra and Arunachal Pradesh.³³⁶ But the tenor of the protests changed in 2008, a year of significant monsoon floods, to emphasize the dam's safety risks and its consequences for downstream populations left out of the consultation process for the dam. Civil society organizations—the All Assam Students Union, Krishak Mukti Sangram Samiti, Takam Mising Porin Kebang, and Asom Jatiyatabadi Yuba Chatra Parishad—and a political party, the Asom Gana Parishad, joined the opposition. In 2011, the Krishak Mukti Sangram Samiti sent a petition with 110,000 signatures on it to then prime minister Manmohan Singh to ask for a moratorium on dam building.³³⁷

Popular pressure produced short-term gains. Ramesh, by then minister of environment and forests, met with protesters. The central government shortly thereafter set up a committee to examine issues with the dam, and construction was halted in 2011. Even after this, though, opponents of the project and the government continued to put forward competing assessments—both asserting objectivity—of the dam's vulnerability to earthquakes, impact on environmental conditions, and benefits for surrounding communities.³³⁸

The movement against LSHEP is a textbook example of activism in the tradition of environmentalism of the poor. Much of the opposition to the project came from local farmers and fishermen downstream of the project who feared the loss of their livelihoods because of the dam's construction and who had not been included in consultations about the project despite the large, negative, downstream impacts of dams.³³⁹ They objected to the central government's strong belief in the necessity of investing in hydroelectric power for development.

The invocation of climate change to oppose LSHEP and mega dams broadly emerged around 2009 or 2010. The spread of these ideas was facilitated by a web of connections between both local and international nongovernmental organizations, scientists, journalists, and activists.³⁴⁰ These grew out of existing efforts to improve water management, protect tribal and customary rights in the Northeast, and manage development sustainably. Many of the participants in this network were highly locally rooted but conversant with an international community that shared their priorities around climate and environmental justice.

Much of the opposition to the project came from local farmers and fishermen downstream of the project who feared the loss of their livelihoods because of the dam's construction.

Costanza Rampini, an environmental scientist, has described the condition of riparian communities near dams in the Northeast as “double exposure.” Her work in Arunachal Pradesh finds that “dams along the Brahmaputra are worsening floods, reducing winter

season flows, and increasing overall flow variability, hence compounding the impacts of climate change on river flows.”³⁴¹ Residents of the riverbanks are highly sensitive to this, as journalist Snigdhendu Bhattacharya highlights in his reporting on the Northeast:

Hemanta Madhab Gogoi, a resident of Lakhimpur district and an activist of the Rajbor Dal political party, said one of the reasons they are opposing the Lower Subansiri project is the changing rainfall pattern. “Heavy rains are coming in quick bursts following prolonged dry seasons. Droughts and floods have both increased. Playing with nature in this unpredictable period is like committing hara-kiri,” he said.³⁴²

Opposition to the dams, while certainly linked to issues around compensation and exploitation, is also deeply connected to the desire among rural populations for a stable relationship with the Brahmaputra and its tributaries. The already unpredictable rivers and the increasingly unpredictable rains are made even more difficult to prepare for by dam projects with limited parochial benefits and high-variance outcomes for farmers, including drought and flash floods. Access to climate science allows activists to link rural and agrarian

concerns with the work being done to adapt to and mitigate climate change at the international level.

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Connections between climate scientists and activists on the front lines allowed scientific arguments to be foregrounded in protest rhetoric. In 2010, climate scientist Partha J. Das, who leads water and climate research at the conservation nonprofit Aaranyak in the city of Guwahati in Assam, contributed a section on “The Hydropower–Climate Change Nexus” to a white paper on dams in the Northeast. The article warned of severe, negative consequences for adaptation from construction, pointing to the possibility that dams might exacerbate both water scarcity, as increasingly intermittent

rainfall could end up trapped behind dam walls, and flash flooding, as outbursts could dump too much water for dams or land to absorb, forcing the release downstream of large volumes of high-velocity flow.³⁴³

Das was networked with activists such as Monoj Gogoi and K. K. Chatradhara—both from the town of Gogamukh, which is close to the site of LSHEP—through nongovernmental organizations such as the Rural Volunteer Centre, “a non-governmental and non-profit organization committed to fostering sustainable development and resilience among vulnerable communities.”³⁴⁴ These connections enabled the rapid uptake and sharing of information between urban and rural contexts, and between researchers and activists. Gogoi was among several interlocutors to point out to me that increasingly intermittent rainfall patterns cited by the Intergovernmental Panel on Climate Change were likely to make hydroelectric dam projects white elephants with far lower actual generation than their nameplate capacity—all while still cutting off the downstream from regular flows.³⁴⁵ From

his perspective, “everything is linked to the Subansiri” in his part of Assam. Thus, the combined disruption of climate change and the dam project threatened fishermen, farmers, and riverbank communities alike.³⁴⁶

By the early 2010s, the effects of climate change appeared in activist writings on dams in the Northeast. A communiqué released by civil society groups from the states of Manipur, Meghalaya, and Assam after a 2014 Consultation on Dams and Climate Change in India’s North East criticized large dams on climate change–related grounds. The passage about LSHEP argued that:

The 2000 MW Lower Subansiri Dam will not only destroy forest areas in Arunachal Pradesh but also huge agriculture land in Assam. Destroying massive forest areas will only liberate colossal quantum of Green House Gases, viz, Carbon dioxide, Methane etc, responsible for climate change and crisis in the Earth’s atmosphere. The climate change implications of the submergence of agriculture land and forest areas by these mega dams has never been assessed.³⁴⁷

The communiqué made similar arguments about the Tipaimukh project in Manipur, and dam developers were criticized for seeking to receive carbon credits through the United Nations’ Clean Development Mechanism for their projects.

Chatradhara, who represented the People’s Movement for Subansiri Valley during the aforementioned consultation, has carried its message further. His work has linked the anti-dam movement to the perception of a water crisis centered on a more unpredictable riparian environment. In an interview with Assam Times, he said, “The water crisis in Northeast India is no longer a distant threat—it is happening right now. Our rivers are drying, floods are more destructive than ever, and communities are struggling for reliable water access. We cannot afford to wait any longer.”³⁴⁸ The message from groups such as his is that the region needs investment in climate-resilient infrastructure to withstand increasingly erratic rains and floods. Dams are too static and inflexible to form a part of this future.

By presenting dams as actively contrary to the goals of climate change mitigation and adaptation, activists, informed by climate science communicated through interlocutors including Das, have sought to foreclose the possibility of using the green transition to justify dam construction. Unlike anti-developmentalists focused on ecosystem health or biodiversity, they do so with a focus on the consequences of dam construction for both development and climate adaptation. Dams are presented as nonresilient infrastructure that hurt people’s ability to earn their livelihoods, jeopardize public safety by making flash flooding more likely, and remain economically infeasible because climate change may reduce the consistency of the flows of water they depend on.

Conclusion

After the National Democratic Alliance coalition, led by the Bharatiya Janata Party, came to power in New Delhi in 2014 and in Assam in 2016, it slowly became clear that LSHEP would be completed.³⁴⁹ Activists turned to coalition-building. In 2019, Chatradhara and S. K. Chakraborty, a journalist from the city of Shillong in Meghalaya, convened the first North East India Water Talk (NEIWT). Envisioned as a platform for grassroots conversations about water-related issues in the Northeast, NEIWT represented an attempt to create a kind of broad, open civic space for important but underrecognized issues related to flooding, water scarcity, clean water, and dam construction.³⁵⁰

The most tangible product of NEIWT has been *A Compendium of Water Stories from North-East India*, a Heinrich Böll Stiftung–funded project that collects thirty essays about water from across the Northeast. The essays reflect the varied relationships and experiences of water that citizens of the Northeast have, such as the terror of the Brahmaputra in spate and the sacred relationship between local communities and water sources in the hills of the Shillong Range of Meghalaya. Contributors to NEIWT have linked the kinds of water crises experienced in the Northeast to climate change. When floods swept Tripura in 2024, Thomas Malsom, a NEIWT affiliate, wrote, “Tripura’s heavy rainfall is a testament to the ecological imbalance caused by anthropogenic activities, which has fuelled the state’s climate catastrophe. Tripura’s August downpour, which resulted in record-breaking flooding, serves as yet another warning sign of growing apprehension about future climate events.”³⁵¹

NEIWT’s readiness to discuss both environmental and climate issues demonstrates a phenomenon that is occurring around the world but is especially clear in Northeast India: the gradual merger of the two issue categories as the conversation about climate change expands to be more inclusive of adaptation-related issues that are clearly connected to environmental justice. The example of the past decade shows how climate science can and does inform movements that stem from very different roots—in this case, the Indian tradition of the environmentalism of the poor. By accessing climate science and understanding the implications of climate change for local contexts and issues, activists are able to construct movements that are simultaneously local and integrated with international audiences and concerns.

For Arab Youth, Mass Mobilization Won't Fight Climate Change

Valerie Boutros and Amr Hamzawyi

Throughout the Arab world, climate change has led to brief episodes of mass mobilization by impacted communities and put forward popular demands for more effective mitigation and adaptation efforts. At the core of the Hiraak Rif Movement in Morocco in 2016–2017, the grassroots mobilization in Libyan Derna following the 2023 devastating floods, and local mobilization in Yemen demanding accountability for polluted water and other environment issues has been citizens' realization that their governments fail to address the impacts of climate change as well as continue to exclude them from governance.

However, these climate mobilizations build upon more than a decade of Arab experiences with mass mobilization. When the first wave of Arab Spring uprisings broke out in 2010, citizens memorably seized upon public spaces demanding bread, freedom, justice, and dignity.³⁵² Young people in particular organized powerful movements and coalitions capable of credibly demanding political change. Fueled by existing grievances and long-standing deficits, the region's youth bulge came at a historic juncture, resulting in unexpected turnout and, later, unanticipated consequences.

But the unexpected activism of Arab youth in 2011 triggered a paradigm shift toward consideration of the agency of activists and the possibility of mass mobilizations as drivers of change in the region. Since then, mass mobilizations in the Arab world have articulated a range of grievances against citizens' lack of representation and the failure of authorities to consider their interests. Increasingly, the grievances of Arab youth have focused on the climate space. Weak climate mitigation and adaptation efforts, the fallout of major climate

disasters, and increased hardship induced by civil wars have led youth groups to organize and mobilize for the climate using issue-based strategies. Through this lens, this article explores the emergence of the Arab uprisings in the early and late 2010s and examines how these protests laid the groundwork for climate activism in the Arab world today.

Youth Bulge and Cyber Activism

The 2011 surge in activism brought to the fore the sociopolitical significance of certain Arab demographics,³⁵³ especially those under the age of twenty-five. Reports from the prior decades revealed that since 2002, Arab governments had failed to attend and respond to the legitimate needs and demands of their young populations aspiring for better education, work opportunities, social mobility, true political representation, social justice, and freedom of expression.³⁵⁴

Central to the Arab Spring were the ways that young Arabs organized protest networks and coalitions, and how they mass mobilized for change. Young Arabs' activism employed social media—especially Facebook and Twitter (now X)—to raise awareness of their political demands and mobilize, first online then on the ground.³⁵⁵ Thus, cyber activism resulted in protest activism and mass mobilization among the Arab youth,³⁵⁶ spearheading the 2011 uprisings and, in turn, motivating a wider range of Arab populations to protest. This trend persisted in the outbreak of the second wave of uprisings in 2018–2019, with cyber activism again forming a central pillar for mobilization and coalition building for democratic change and social justice.

For instance, Algeria's peaceful (or *silmiya*) Hirak movement used a social media campaign as a core strategy to mobilize.³⁵⁷ Learning from some of the shortcomings of the first wave of uprisings, in which online organization did not result in sustained, on-the-ground mobilization, Algerian activists used online organizing for peaceful protests and, with this form of innovative collective action, forced security forces to exercise restraint and motivated others to participate in the public sphere. Iraqi youth, for example, employed cyber activism to combat censorship and control,³⁵⁸ engage in resistance and political action, and promote citizen-led journalism. Thus, the effects of cyber activism endured beyond the first wave and carried over to second wave movements.

Religious Radicalism and Resistance for Change: Disenchantment and Retreat

However, the first wave of Arab uprisings brought about winds of change that did not always align with the aspirations of young citizens. The removal of sitting presidents in Tunisia and Egypt resulted in neither sustained political openings nor orderly paths to democratic transition.³⁵⁹ Confronted with the continued dominance of old elites and the hijacking of the uprisings by religious radicals,³⁶⁰ youth movements and coalitions lost hope in achieving

sustained change. Furthermore, as members of the enduring old political guard joined the new ruling structures, the youth were again marginalized by the very power structures they protested against.³⁶¹ The collective view of young citizens in Tunisia and Egypt shifted drastically starting in 2013–2014 from feeling empowered and believing in their ability to democratize politics and modernize society,³⁶² to resignation and disenchantment resulting from the rise of religious radicals, to a preference for stability.³⁶³

Ambitious youth expectations clashed with power dynamics and societal realities that severely hindered opportunities for modernization and democratization. Youths' sense of elevated agency was confronted by the political entrenchment of old elites and religious right-wing movements,³⁶⁴ both willing and ready to hijack the youth uprisings and push young Arabs back to their previous state of marginalization and ineffectiveness. Therefore, while some activists continued the fight, many saw the survival of old political elites and religious radicals as a definitive loss for their movement, accepting that it had been hijacked by the very people they sought to overthrow.³⁶⁵ Public opinion polls indicated that this resignation also translated into an overall decline in political interest and participation.³⁶⁶ Youth participation in elections and referendums plummeted.³⁶⁷

Since then, Arab youths have been generally disengaged from formal and informal politics. In the years after 2011, youth civic engagement decreased in all forms: political party membership, electoral turnout, attendance of campaign rallies, participation in protests, attendance of meetings, and signing petitions. Key findings on youth opinions, reported by Arab Barometer,³⁶⁸ indicate that youth in the Middle East and North Africa have little trust in government, look negatively at politics, and favor stability and gradual reform over sudden change.³⁶⁹ Young activists refrained from transforming their movements and coalitions into political parties, labeling political parties corrupt instruments geared to domesticate the youth.³⁷⁰

Meanwhile, in Libya, Syria, and Yemen, by 2012 peaceful uprisings had already begun to degenerate into violent clashes between incumbent regimes that refused to surrender to popular pressure and emergent militarized opposition movements with radical political and ideological backgrounds.³⁷¹ Violent clashes in these countries led to civil wars that exerted great pressures on states and societies.³⁷² The results have been a combination of state fragmentation; collapse of coexistence across multiethnic, multireligious, and multitribal settings; and the end of peaceful mass mobilization as a means of change.³⁷³ In these horrific conditions, youth activism for democracy and social justice in the three countries receded and was replaced with mere survival activism in the homeland and in the exiles to which many Libyans, Syrians, and Yemenis started seeking safety.

State Repression and the Loss of Faith in Political Change

The second wave of uprisings in 2018–2019 were also led by young activists and students seeking to mobilize their respective populations.³⁷⁴ Their primary grievances were related to unemployment, social injustice, political corruption, electoral fraud, and restrictions

on personal freedoms. Unlike the first wave, the second wave understood how deeply entrenched ineffective governance was in all areas of society—political, social, and economic.³⁷⁵ Thus, protesters' goal became to establish a new political order: what scholars have labeled an orientation “against everyone.”³⁷⁶ In contrast to the protesters of the first wave, those of the second wave had a widespread cognizance that both their governments and their opposition forces were incapable of delivering on promises of political and economic reform.³⁷⁷ They did not trust their political leaderships would meet their demands,³⁷⁸ whether it was the incumbent or opposition leaders. Furthermore, the protesters rejected sectarian divisions,³⁷⁹ such as those present in Lebanon and Iraq, in favor of cohesion in order to achieve a new beginning. Hence, any reforms short of restructuring entire political systems were insufficient and could not satiate the grievances of the second wave's protesters.³⁸⁰ This was a tall order that was both unattainable and destabilizing.

In Algeria, the Hirak movement protests to oust the president started in February 2019. They were peaceful in nature; however, the young activists were met with extreme violence and intimidation in order to subdue their revolutionary initiatives.³⁸¹ The state also employed selective repression, legal reforms, and carefully stage-managed elections to slow protesters' momentum.³⁸² In Iraq, the Tishreen uprising—a series of demonstrations, marches, sit-ins, and civil disobedience spanning 2019–2021—was made up of young Iraqis seeking better services and opportunities in their country.³⁸³ The youth coalitions were violently subdued, allowing entrenched authoritarian powers and political parties to regain their foothold on society.³⁸⁴ In both countries, the result was a stalemate, with both the government and opposition incapable of exacting definitive results. Youth were left with a sense of resignation: Public opinion polls found that majorities or near-majorities of the youth populations expressed a desire to emigrate and seek opportunities elsewhere.³⁸⁵

Young Algerian and Iraqi activists, specifically those supporting opposition movements, have since retreated from the political sphere, their faith in political change and newfound sense of agency squandered.³⁸⁶ Fear of violence and punishment has eliminated youth engagement in public space activism—which also has implications for climate activism in one of the world's hottest and driest regions.

Climate Activism and Youth Representation

In the countries of the Arab uprisings, youth have largely withdrawn from politics and public affairs. However, some forms of youth activism continue today, particularly those more specifically focused on certain issue areas such as climate change rather than broader regime change. In other words, youth activists working in the climate space have come to favor working with existing governments either to avoid repression or to ensure more immediate and tangible outcomes that alleviate some of the hardships resulting from climate change.

In the countries of both the first and second waves, youth groups, networks, and organizations have emerged that focus on sectoral and specialized issues such as women's rights and freedoms, the conditions of marginalized populations, access to basic services, and the issue of climate change and its societal implications.³⁸⁷ For example, groups such as Djerba, Authenticity, Heritage and Environment network in Tunisia; VeryNile in Egypt; EcologicalDZ in Algeria; and Humat Dijlah (Tigris River Protectors Association) in Iraq are active in the climate space.³⁸⁸ As was the case in 2011 and 2018, these actors operate throughout civil society rather than as formal political parties or movements, seeking to influence policy by raising public awareness on the one hand and engaging in dialogue with governments through various civil society groups on the other.³⁸⁹

However, these efforts have mixed success. A preliminary survey of citizens assessing state responses to climate issues in Egypt, Tunisia, Algeria, and Iraq indicated a wide perception among citizens that the ongoing policy dialogue between civil society organizations and governments on environmental strategies has been limited. The survey also found a common preference—particularly among urban populations—for governments to focus on climate adaptation and resilience projects and efforts, such as financing green economy projects.³⁹⁰

Alongside the need for greater government initiatives, the survey also indicated citizens were enthusiastic about raising awareness about climate issues and the current impacts of climate change on human security in its broadest sense among specific social groups, such as the urban, educated, or middle-class; women; university students; and youth entering the labor market.³⁹¹ These youth-led networks and organizations often form the core of their countries' civil society representation at global climate summits.

While the countries of the first and second waves have some civil society activity working on climate issues today, they still lack a cohesive sector of nongovernmental actors working among marginalized populations disproportionately affected by climate change.³⁹² For instance, few organizations work in rural areas or among farming communities or fishermen, despite these groups experiencing disproportionate impacts of climate change.³⁹³ Representing the concerns and interests of these groups is typically left either to governments and their local structures—which vary significantly in their governance and empowerment capacities—or to development agencies and a mix of local and foreign NGOs.³⁹⁴

As Amir Gohar's article from this series explains, government administrations—across all levels and titles, from provinces and districts to local councils and units—governing water, energy, and agricultural issues that especially affect the rural sector tend to suffer from limited effectiveness, transparency, and popular participation.³⁹⁵ Simultaneously, the dysfunctionality and limited presence of environmental groups, networks, and organizations exacerbate the conditions experienced by low-income and resource-dependent populations. As a result, governments in the Middle East and North Africa continue to develop and implement policies in areas such as agriculture, water consumption, and energy without genuine community participation.³⁹⁶ The voices of women, youth, farmers, and local government representatives are not seriously heard, nor is there a robust NGO infrastructure that can bring those voices into the public sphere.

Beyond the exclusion of rural communities from governance frameworks, another constraint lies in the fact that many climate activists tend to build bridges and maintain continuous coordination and communication with governments—whether in the context of global climate summits or regarding environmental policies applied in rural and urban areas.³⁹⁷ This stems from a legitimate desire to influence public policy and aims to protect these groups, networks, and organizations from governmental restrictions on their activities and funding sources. However, the flip side of this pragmatic approach is that the independence of these actors is also subject to legitimate doubts, and their ability to democratically oppose adopted policies and propose practical alternatives remains a topic of public debate.

In many ways, these tensions can be considered a natural response to the lessons learned from the uprisings of the 2010s and especially the young activists' retreat from politics that followed them. Climate activists are probably keen to avoid being associated with radical demands and sudden change. On the other hand, their younger cohorts have very little trust in politics. There is no doubt that the limited grassroots and institutional reach of climate change actors—in addition to the issue-specific nature of their advocacy—makes it difficult for them to influence public policies in the climate space. However, dialogue between activists and governments can promote a societal and political environment conducive to gradual reforms that aim at climate mitigation and adaptation.

Climate Activism Across Urban and Rural Divides in the Middle East

Amir Gohar

Countries across the Middle East and North Africa (MENA) are contending with rising temperatures, water scarcity, and extreme weather events that impact ecosystems and livelihoods unevenly across geographic and socioeconomic contexts.³⁹⁸ In response, the governments of Egypt, Morocco, and Jordan have adopted long-term policy frameworks that emphasize mitigation, adaptation, and sustainable development: Egypt's National Climate Change Strategy 2050, Morocco's National Adaptation Plan 2030, and Jordan's 2022–2050 National Climate Change Policy. While these national agendas align with international climate commitments, they often obscure important differences between urban and rural settings. Local actors, including civil society organizations, youth groups, farmers, and informal workers, have stepped in to fill these policy gaps and confront climate challenges through both organized activism and everyday environmental practices.³⁹⁹

Focusing on Egypt, Morocco, and Jordan, this piece explores how civil society actors operate within and around state climate policies, attending to the political and spatial conditions that shape the policies' visibility, legitimacy, and impact. It compares expressions of climate engagement—whether activism, adaptation, or everyday environmental struggle—in urban centers such as Cairo, Rabat, and Amman with those in rural or peripheral areas such as El Minya, Errachidia, and Tafleeh. While national strategies are presented as inclusive and forward-looking, local realities often reveal a disconnect between centralized policy and the lived conditions of climate vulnerability. This article considers a variety of actors from formal NGOs and youth-led campaigns in capital cities to community protests over water, land, and environmental degradation in rural regions. These actions—whether visible or marginal, tolerated or repressed—expose the political contours of climate response shaping who gets to act on climate and under what conditions.

Egypt

Egypt's climate activism unfolds within a heavily regulated civic space, shaped by state-controlled sustainability agendas and limited freedoms of association. The government promotes strategies such as the National Climate Change Strategy 2050 and its updated nationally determined contributions (NDCs), emphasizing green energy and water efficiency.⁴⁰⁰ However, implementation remains tethered to donor agendas and investment logics, often privileging visibility over equity and megaprojects over community resilience, with real participation restricted to a narrow circle of approved stakeholders.⁴⁰¹

Civil society actors outside of the narrow circle, ranging from social enterprises such as VeryNile and Banlastic Egypt to informal networks like the Zabbaleen waste collectors, fill critical gaps by leading awareness campaigns, clean-up initiatives, waste reduction programs, and environmental education in marginalized communities. Yet these actors confront pervasive constraints: The 2019 NGO law, bureaucratic surveillance, travel bans, and the threat of dissolution limit their scope and silo activism, so actors must often work in isolation and compete for limited external support.⁴⁰²

In 2024, Egypt's decentralization plan, announced at the World Urban Forum 12 in Cairo, signaled a supposed shift toward local governance. However, the centralized control over governorates was maintained, and civic engagement in local affairs (especially decisionmaking and budgeting) was selectively permitted through state-controlled channels. This reorganization, including restructuring the Civil Society and Civic Participation Platform in 2023–2024, has allowed the government to maintain control over local political dynamics while projecting a reformist image. While climate activism tends to be tolerated more than overtly political dissent,⁴⁰³ it remains tightly bound by shifting thresholds of control.⁴⁰⁴

Cairo

Cairo serves as the epicenter of Egypt's climate agenda, hosting numerous high-profile sustainability initiatives such as the European Bank for Reconstruction and Development's Green Cities initiative as well as clean mobility pilots like the Cairo Ring Road Bus Rapid Transit system and electric taxis in the New Administrative Capital.⁴⁰⁵ While these projects are largely state-led, civil society and grassroots actors in Cairo are advancing a more participatory climate agenda. Social enterprises like Schaduf promote rooftop farming, urban agriculture, and eco-friendly landscape design in informal and low-income neighborhoods. In fact, Schaduf reported installing over 500 rooftop farms on low-income homes in the Cairo suburb Hadayek Helwan, enhancing food security and green coverage in marginalized districts.⁴⁰⁶ In Historic Cairo, citizen-led greening is reclaiming derelict land through pocket park initiatives. An example is the Al-Khalifa Heritage and Environment Park, which transformed 3,000 square meters of an elongated ridge into a vibrant green space with recreational areas, waste systems, and childcare facilities. Notably, its irrigation

system innovatively uses water extracted during the process of pumping away accumulated water that had submerged adjacent thirteenth-century domes of al-Ashraf Khalil and Fatima Khatun.⁴⁰⁷

Despite these efforts, civil society's impact remains fragmented: Projects are often donor-dependent, siloed, and concentrated in affluent areas, while peripheral neighborhoods receive minimal support. Moreover, the informal urban ecosystem continues to deliver essential climate and environmental services. The Zabbaleen community in the Manshiyet Nasr district, for instance, recycles up to 60 percent of Cairo's waste yet receives scant official recognition and faces threats from privatization.⁴⁰⁸ A more overt clash emerged on Warraq Island, where residents resisted forced evictions under the state's Cairo 2050 modernization vision. Activists framed their defense of land and livelihood as an environmental cause, asserting rights to green space, clean water, and ecological continuity.⁴⁰⁹ Such examples reveal how climate discourse in Cairo is formalized and visible when it aligns with state priorities and suppressed when it challenges dominant development logics or spatial control.

El Minya

El Minya Governorate lies in Middle Egypt along the Nile floodplain, its capital city 245 kilometers (about 150 miles) south of Cairo. Agriculture is the backbone of its economy, employing nearly half the labor force, yet poverty affects around 60 percent of its largely rural population, with over four-fifths living in villages.⁴¹⁰ El Minya, long peripheral to Egypt's development priorities, is increasingly central to the country's evolving climate governance. As early as 2010, residents protested urban encroachments on agricultural land and irrigation failures. These were early expressions of environmental dissent that predate today's climate discourse.⁴¹¹ More recently, state-led initiatives have expanded, such as the \$94.6 million Sustainable Agricultural Investments and Livelihoods (SAIL) program (2014–2025), a partnership with the International Fund for Agricultural Development aimed at rural infrastructure development and solar irrigation.⁴¹² The project has made tangible contributions to rural livelihoods and community infrastructure; however, persistent problems with funding disbursement, slow implementation, weak outreach, and management inefficiencies have limited its overall impact.¹⁶ Similarly, under the Decent Life initiative, 1.93 billion Egyptian pounds (\$40 million) were allocated in 2021 to drinking water projects in 192 villages across El Minya, yet there have also been issues regarding delays and limited public participation.

In contrast, grassroots initiatives represent a more participatory model. The Coptic Evangelical Organization for Social Services's Promoting Citizenship Values and Practices project encourages civic engagement in climate action, including promoting sustainable farming and climate literacy.⁴¹³ Complementary efforts have also emerged from international-local partnerships. UN-Habitat, working with the Minya Drinking Water and Sanitation Company, installed seven riverbank filtration units in Bani Amer and Kasr El Rakeeb, establishing nature-based water systems that now provide clean drinking water to over 30,000 residents.⁴¹⁴ Meanwhile, informal community groups and agricultural

cooperatives are experimenting with climate-resilient crops and alternative irrigation strategies, driven by firsthand experiences of fluctuating Nile River flows and rainfall variability. Youth initiatives, although often undersupported and operating without formal recognition, have organized small-scale tree-planting drives, canal cleanups, and awareness walks that infuse environmental care with local identity.

Morocco

Morocco is frequently celebrated as a climate frontrunner in the Global South, due to its ambitious national policies and landmark renewable energy initiatives such as the Noor Ouarzazate Solar Complex. In addition to its National Adaptation Plan, Morocco's updated nationally determined contribution has pledged to reduce greenhouse gas emissions by 45.5 percent by 2030, while its National Climate Plan (PCN 2030) sets a target of achieving 52 percent of installed electricity capacity from renewable energy sources by the same year.⁴¹⁵ Ministries and national agencies orchestrate Morocco's green transition in a highly top-down manner. Financial flows from international donors, though substantial, tend to move through these centralized channels, often sidelining regional governments and grassroots organizations.

As a result, civil society participation is uneven. While NGOs, youth collectives, and private actors contribute within donor-aligned, technocratic frameworks, more oppositional or justice-oriented movements are frequently excluded or actively repressed. For example, anti-mining protests in Jerada, which ran from late 2017 through 2018 and were triggered by the death of several artisanal miners in dangerous, abandoned coal mines, have been met with bans on demonstrations, police crackdowns, and mass arrests.⁴¹⁶ In addition, Amazigh land rights advocacy reflects ongoing activism by Indigenous communities seeking recognition of ancestral lands and cultural protection. These efforts often face state crackdowns, arrests, and legal barriers, including trials conducted in unfamiliar languages.⁴¹⁷

Rabat

As Morocco's administrative capital and a showplace for national urban and environmental policy, Rabat has become a hub for flagship development projects and climate-related infrastructure. Its strategic importance means it often receives outsized investment in green public transit, river restoration, and urban renewal, framed as models of sustainable city-making.⁴¹⁸ However, the scale and visibility of these interventions frequently mask underlying tensions between centralized planning and local realities. In Rabat, the impacts of climate-oriented projects often clash with local needs, sparking civic pushback. A prominent case is the Bouregreg Valley Development, a flagship riverfront renewal scheme that displaced traditional fishing communities. Excluded from planning and undercompensated, fishermen formed the Bouregreg Cooperative in 2009 to defend their livelihoods and market access, signaling grassroots resistance to environmentally framed urban agendas that marginalize established economies.⁴¹⁹

Another wave of activism unfolded in Rabat's suburbs in 2024, when Indigenous residents of Kish al-Oudaya launched protests against state reallocation of their ancestral territory without consultation. They demanded fair representation, accurate registries of rights-holders, and just compensation, even establishing community organizing bodies to resist dispossession.⁴²⁰ These mobilizations spotlight how land-based environmental governance is intimately tied to claims of justice and voice. While the Rabat Ville Verte strategy and wastewater irrigation upgrades are presented as modernization efforts, actual consultative processes remain scarce. Nonetheless, the Bouregreg and Kish movements reveal burgeoning civic resilience: Communities are reclaiming agency by contesting exclusionary environmental projects through cooperatives, public demonstrations, and legal claims. These local interventions challenge technical progress narratives, demanding that climate governance be inclusive, transparent, and responsive to the everyday rights of residents.

Errachidia

Errachidia, located in Morocco's eastern High Atlas Mountains and Ziz Valley, is shaped by harsh climatic conditions and fragile oasis ecosystems that face accelerating pressures from drought, water scarcity, and land degradation.⁴²¹ In this context, climate resilience is not merely a matter of top-down planning, but also, it is an everyday practice of survival, adaptation, and quiet resistance rooted in traditional irrigation systems, agrodiversity, and community resource-sharing.⁴²² While the Moroccan government, supported by the World Bank, has introduced initiatives like the distribution of 200,000 vitro date palm seedlings and supported women- and youth-led cooperatives, these programs build on long-standing local ingenuity.⁴²³ For generations, communities in Errachidia have developed autonomous systems to cope with scarcity, including ancestral irrigation networks known as khattaras, vernacular earthen architecture, and intricate rules of water governance grounded in collective labor and inherited rights. Recent attempts to revitalize khattara networks have rekindled debates about water access, historical equity, and environmental justice. Local farmers and water users are asserting the value of traditional water rights (in other words, entitlements based on past contributions to canal construction) as a counterpoint to newer, often technocratic water management approaches.⁴²⁴ This defense of territorial knowledge and communal systems is a form of civic resilience that challenges the invisibility of rural adaptation practices in national policy. In Errachidia, climate activism is not marked by protest but by the ongoing negotiation of heritage, rights, and self-determination in the face of ecological precarity.

Jordan

Jordan's climate governance operates within a context of acute resource scarcity and regional instability. As one of the world's most water-poor countries, it has adopted forward-looking strategies, including the National Climate Change Policy (2022–2050) and its updated nationally determined contribution (NDC) pledging a 31 percent emissions reduction by

2030, conditional on international support.⁴²⁵ These commitments, supported by donors such as the Green Climate Fund, prioritize mitigation through renewable energy and adaptation through improved water management and agricultural sustainability.⁴²⁶

Community-based initiatives are emerging. The Jordanian Hashemite Fund for Human Development, in cooperation with the Ministry of Water and Irrigation and the German Agency for International Cooperation, has advanced community-based water conservation through initiatives like the Water Wise Women program, which trained over 300 women in plumbing, water harvesting, and household conservation.⁴²⁷ Meanwhile, youth groups like the Green Generation Foundation have launched eco-literacy programs, organized climate marches, and trained young people to participate in Jordan's national climate policy processes.⁴²⁸ Across Jordan, women's cooperatives are revitalizing traditional crops and permaculture techniques, offering localized responses to climate stress. Examples include the Shuleh Women Cooperative, which markets olives, dairy, and rain-fed produce; the Habak women-led hydroponics cooperative in Dhiban; and permaculture training programs such as the Women's Empowerment Programme at the Greening the Desert Project.⁴²⁹ These initiatives reflect a growing civic climate consciousness, even as national planning remains centralized and often disconnected from local realities.

Amman

Amman has emerged as Jordan's climate action flagship, with its Climate Action Plan setting ambitious targets such as reducing greenhouse gas emissions by 40 percent by 2030 and achieving carbon neutrality by 2050.⁴³⁰ Backed by international donors and global networks like C40 Cities and Local Governments for Sustainability, the city has prioritized electrified transport, stormwater infrastructure, waste management, and green public spaces.⁴³¹ However, these high-profile projects are often concentrated in central areas and align more with donor logics than grassroots needs, raising questions about equity and long-term sustainability.⁴³²

Amman's climate activism landscape is shaped by a mix of institutional and grassroots efforts. Civil society organizations such as EcoPeace Middle East, Green Generation Foundation, and the Jordan Environment Society lead public awareness campaigns, urban gardening projects, and policy advocacy efforts, often in collaboration with international bodies.⁴³³ While these organizations bring funding and expertise, they also face limitations in autonomy and agenda-setting, especially when their work intersects with politically sensitive urban issues. Youth and student movements contribute actively through campus-based clubs, public events, and digital advocacy. They ensure climate issues remain visible in public discourse but often operate within narrow, safe registers, emphasizing awareness over structural critique.⁴³⁴ Similarly, local women's groups and neighborhood committees pursue tangible interventions—community gardens, recycling programs, and reforestation—but their reach is often constrained by limited support and infrastructural disparities.

Tafileh

Located in southern Jordan, Tafileh Governorate is emblematic of the spatial and political margins of the country's climate and development agenda. Poverty rates remain among the highest in the country, with over 17 percent of residents living below the poverty line and unemployment reaching 23.3 percent in 2023.⁴³⁵ The National Food Security Strategy identifies Tafileh as the most food-insecure governorate in Jordan.⁴³⁶ Rich in phosphate and oil shale reserves but lacking basic infrastructure and services, the governorate has long experienced a paradox of resource wealth and developmental neglect. Tafileh has seen repeated protest actions and public objections related to mining, from sit-ins by unemployed residents seeking jobs at Jordan Phosphate Mines Company's Hassa operations to community and ranger-led opposition to proposed copper extraction threatening the Dana Biosphere Reserve.⁴³⁷ While these protests rarely use the language of "climate justice," they represent clear forms of environmental claim-making—demanding accountability, redistribution, and recognition. These movements are often informal and coordinated through tribal networks, university student groups, or local elders rather than registered NGOs.

The state's response has oscillated between neglect, securitization, and bureaucratic deflection. Protests have occasionally led to promises of job creation or environmental studies, but systemic change has been limited. National climate policies—such as the Climate Change Policy 2022–2050 or the Green Growth National Action Plan—reference sustainable land use and environmental equity, but they do not meaningfully incorporate peripheral regions like Tafileh into participatory planning. Instead, rural engagement is largely instrumentalized through donor-funded rural development projects, so it is often short-term and disconnected from broader ecological or political frameworks.

At the local level, residents and youth have adopted everyday forms of environmental adaptation, including rainwater harvesting, community-led terracing, and informal reforestation.⁴³⁸ However, these practices are rarely recognized as climate actions within national reporting or donor metrics. This dynamic reflects the broader civic space in Jordan, where Amnesty International has documented restrictive laws and government oversight that limit NGO advocacy and discourage political engagement.⁴³⁹

Spatial Disparities in Climate Adaptation: The Urban–Rural Divide and Beyond

While adaptation efforts exist across both urban and rural contexts in the six areas discussed, the logics that shape them often differ in formality, orientation, and degree of institutional embeddedness.

In urban centers, adaptation tends to come in infrastructure-heavy, technocratic forms, often led by state or municipal authorities with donor or private sector backing. These projects typically prioritize visibility, scalability, and alignment with broader modernization

agendas. This approach often treats the urban landscape as a platform for demonstrating climate readiness, producing measurable outcomes such as emissions reductions, improved transit systems, or enhanced green infrastructure. However, this same model frequently sidelines citizen involvement, reducing urban communities to passive beneficiaries rather than active agents of change. Even where urban planning rhetoric gestures toward inclusion, participatory mechanisms remain weak or tokenistic.

In contrast, rural and semi-rural areas, while often operating with fewer resources, exhibit adaptation approaches that are more socially embedded and participatory, even when facilitated by government-linked programs or international development actors. The presence of initiatives in Tafiheh, Errachidia, and El Minya shows that adaptation in these areas is not absent, but is sometimes shaped by relational governance, where local networks and hybrid institutional arrangements (for example, NGOs, cooperatives, or village committees) become essential to implementation. In some instances, these approaches tend to integrate livelihoods, water, land, and social cohesion in holistic ways, if less formalized or visible within national policy narratives.

What emerges is less a binary of action versus inaction and more a contrast between standardized versus contextualized adaptation paradigms. Official urban responses often draw from global best practices and funding criteria, favoring replicability and impact metrics. Rural adaptation, meanwhile, leans on place-based knowledge and negotiated legitimacy, prioritizing endurance over innovation. The climate challenge for both urban and rural communities is not only spatial but strategic: how to bridge these modes without diluting the specificity of either. A more just adaptation landscape would not simply redistribute projects geographically but would also reconcile institutional scale with community scale, technical design with lived experience, and policy ambition with local capacity. Recognizing this interplay is essential to moving beyond the urban–rural binary and toward a more integrated, equitable version of climate governance.

Climate activism across the case studies remains uneven, and where it exists, it often functions less as a direct environmental mobilization and more as a substitute or proxy for broader political expression. In contexts where dissent is restricted, particularly in urban settings, environmental discourse can offer a relatively permissible space for voicing grievances about urban inequality, governance opacity, or exclusion from planning processes. In rural areas, by contrast, collective action often emerges around material survival, such as access to water or land, which may not self-identify as “climate activism” but enacts climate resistance through everyday practices.

Recommendations

Ultimately, tackling spatial disparities in climate adaptation is a question not only of environmental justice but also of sustainable development. Strengthening rural adaptation capacities while ensuring equitable urban resilience can contribute to a more cohesive and just climate response.

Addressing climate change challenges in general, and spatial disparities in particular, requires multistakeholder engagement and strong public–private partnerships. Government plays the role of regulator and enabler; communities share their interests, vulnerabilities, and solutions; while the private sector contributes financing and funding, protecting both its own interests and communities through corporate social responsibility and dedicated channels. The following recommendations cannot be achieved without all stakeholders converging, including governments, corporate actors, universities, NGOs, and international donors, each fulfilling their role within this melting pot.

- Integrating rural adaptation practices into national climate strategies by creating place-based policies that recognize rural-specific vulnerabilities and strengths, rather than treating rural areas as secondary to urban interventions
- Decentralizing climate governance to empower local authorities, especially in rural regions, with the autonomy, training, and resources needed to design and implement context-specific adaptation measures
- Investing in rural infrastructure and basic services, including climate-resilient water systems, renewable energy access, and agricultural innovation, to reduce dependency on donor-driven projects and ensure long-term resilience
- Supporting community-based and traditional knowledge systems by formalizing their role in national adaptation plans and allocating funding to scale up successful grassroots initiatives
- Promoting equitable urban resilience by prioritizing climate investments in marginalized and informal urban neighborhoods, ensuring that adaptation is not concentrated in high-income districts alone
- Developing rural–urban collaboration through knowledge exchange platforms, shared data systems, and codeveloped regional adaptation plans that reflect inter-connected vulnerabilities
- Strengthening public awareness and climate literacy, particularly in rural areas, by investing in culturally appropriate education campaigns, local training centers, and community outreach

Bipartisan Backlash Against Geoengineering and Carbon Removal in the United States

Milo McBride

Amid shrinking carbon budgets and accelerating climate shocks, the prospect of deploying carbon removal or geoengineering technologies is surfacing new societal tensions and political resistance in the United States. Carbon removal technologies—such as carbon capture from flue source and direct air capture⁴⁴⁰—have drawn political pushback from both ends of the U.S. political spectrum. Meanwhile, geoengineering interventions—such as cloud seeding and stratospheric aerosol injection⁴⁴¹—are regarded as controversial processes. In theory, stratospheric aerosol injection reflects radiation from the sun, allowing the planet to cool and, as proponents argue, providing time to decarbonize and prevent the worst climatological feedback loops from accelerating. Across the United States, opposition to these interventions is emerging as a potent, cross-cutting force in climate politics, uniting unlikely coalitions of right-wing populists and environmental traditionalists against an increasingly less-relevant technocratic center. These horizon climate technologies have triggered online mobilization, localized demonstrations, and state-level bans from activist politicians. All of this suggests a politically volatile terrain.

This article explores this new frontier for climate activism in the United States. It analyzes how early political backlash is unfolding, creating vacuums for domestic mistrust, and potentially influencing policy for both geoengineering interventions and carbon dioxide removal (albeit, in varying degrees). The first section overviews carbon removal's fraught historical advancement to market and the present-day social and political backlash it has triggered. The second section outlines the trajectory of geoengineering, from its roots in militarization to its foundational place of opposition in conventional environmental camps and new, right-wing populist groups. From there, it examines the preemptive impacts

that geoengineering has had on local politics (and perhaps how they could permeate on the federal level). Lastly, the article zooms out and offers a comparative look into how the politics and policies of other jurisdictions have emerged regarding these contentious climate technologies.

Capturing Carbon

Carbon capture technologies have been deployed for decades, albeit with limited economic and technical success thus far. Capturing carbon from the earth's atmosphere was, importantly, designed to maximize oil production—not abate global carbon emissions. In the 1960s, U.S. and Canadian energy companies began experimenting with enhanced oil recovery (EOR) that injects CO₂ into the subsurface to stimulate the flow of crude oil. But by the new millennium, the potential for carbon capture utilization and storage (CCUS) spread to other hydrocarbon-related projects including natural gas purification in Norway and a coal-based synthetic fuel plant in the United States. Monitored by an International Energy Agency-backed consortium, an EOR facility in Canada was validated, further strengthening the notion that carbon capture could be part of a decarbonization pathway.⁴⁴²

At this moment in modern history, the first global climate discussions were underway—starting with the 1997 Kyoto Protocol—and only a few clean energy alternatives were on the horizon: The nuclear age had screeched to a halt thanks in no small part to the disaster at Chernobyl and the rise of cheap natural gas.⁴⁴³ Wind and solar power were niche and prohibitively costly solutions that were still primarily being manufactured in the developed nations, not China (which would later yield resounding cost curves thanks to Chinese labor costs and innovation).⁴⁴⁴ Much of the developed world's hydropower resources were well established, leaving developed countries with few additional low-hanging fruit for expansion.⁴⁴⁵ Alongside the faulty promise of biofuels, carbon capture was viewed as a potential solution to decarbonization that would not rattle incumbents and respective labor markets. By 2008, the 45Q tax credit was introduced in the United States to help subsidize carbon capture (and the credit was expanded and altered in the following years).⁴⁴⁶

But by the 2010s, carbon capture projects in the United States began to experience economic challenges—and with them, varying degrees of backlash. In 2003, the U.S. Department of Energy (DOE) launched the FutureGen clean coal project, but after repeated cost overruns and redesigns—including a short-lived revival with \$1 billion pledged in funding as FutureGen 2.0—the effort was finally abandoned in 2015 without a plant ever being built.⁴⁴⁷ Several years later, a similar state-backed project in Mississippi also failed, and analysis from the Government Accountability Office found that about half of the \$2.66 billion in innovation funding for carbon capture had been lost to unsuccessful developments.⁴⁴⁸ Despite these setbacks, a 2018 tax law under the first Donald Trump administration helped expand carbon capture subsidies. At the same time, advocacy groups led by youth movements were increasingly skeptical of carbon capture technology used alongside fossil fuel production. (By this time, renewables had neared cost parity with fossil fuels in power markets, by and large, surpassing all economic expectations.)⁴⁴⁹

These dynamics intensified during U.S. president Joe Biden's administration. To start, the administration's goals of a big tent, ambitious climate policy based on the progressive vision of a Green New Deal required bringing centrist Republicans and Democrats on board, which in turn entailed a broad, technological approach. But as early as 2020, progressive groups and eighteen progressive House of Representative members stood firm against CCUS as a solution—with many focusing on concerns about the impact that carbon capture pipelines would have on communities.⁴⁵⁰ An activist from Greenpeace specifically decried the expenditures as a “waste of money,” while Friends of the Earth and other activist groups argued it would further empower and embolden fossil fuel incumbents.⁴⁵¹ These activist sentiments complicate a nuanced reality of carbon capture: Any serious net-zero forecasts envision enormous quantities of carbon removal, and yet much of the carbon capture plans may be driven by incumbents with the know-how to remove and store carbon dioxide.⁴⁵² Carbon capture and removal will—for better or worse—have to be part of the solution. In the end, the Infrastructure Investment and Jobs Act included billions of dollars in carbon capture funding—in particular to direct air capture hubs to scrub carbon from the atmosphere. To further these developments, the 45Q carbon capture subsidy was again expanded in the 2022 Inflation Reduction Act.⁴⁵³

However, progress to develop large-scale carbon removal pipelines and infrastructure was triggering literal frontline resistance. The United States has experienced decades of anti-energy infrastructure activism—from the Earth First! movement's protest against the Glen Canyon Dam to more recent pan-Indigenous solidarity against the Dakota Access Pipeline.⁴⁵⁴ In 2023, advocates in Illinois raised the alarm bell against the Heartland Greenway pipeline that would bring CO₂ from industrial plants across the Midwest to be stored in Illinois.⁴⁵⁵ Many cited a 2020 incident where a CO₂ pipeline leaked in Mississippi, causing adverse health impacts to local residents.⁴⁵⁶ The firm developing the carbon pipeline filed 232 lawsuits—including 156 eminent domain cases in South Dakota—to secure the land for its proposed 2,500-mile CO₂ pipeline, which would cross five Midwestern states.⁴⁵⁷ That litigation strategy triggered local opposition, which helped drive the passage of a South Dakota law banning the use of eminent domain for CO₂ pipelines and contributed to the Public Utilities Commission's decision to deny the project's permit in South Dakota in 2025.⁴⁵⁸ In 2024, a Louisiana-based CO₂ pipeline also began to leak, prompting safety concerns around the state.⁴⁵⁹ By this time, Indigenous groups and environmental justice organizations had begun organizing against CO₂ pipelines or advocating for better standards.⁴⁶⁰

The new political right has also become an increasingly vocal political force decrying carbon capture technology. In Iowa, a rally of over one hundred people—including many in Make America Great Again (MAGA) attire—came out to the Iowa Capitol to protest the Midwest CO₂ pipeline. With signs that read “People Over Pipelines” and “No Deadly Carbon Pipelines,” the crowd was accompanied by Republican lawmakers and then presidential hopeful Vivek Ramaswamy.⁴⁶¹ This emerging, bipartisan resentment had been growing in Iowa since 2022 when the CO₂ pipeline gathered opposition from a strange coalition of traditional environmentalists, farmers, and evangelical Republicans. In one case,

a conservative Christian farmer told POLITICO that only God controls the weather, “not the carbon dioxide.”⁴⁶² In ethos, there are increasing parallels to the anti-geoengineering politics mentioned in the following section, where both the traditional left and new right have begun to confront these frontier technologies with greater mistrust and antagonism (although often for different reasons).

Recently, segments of the Republican Party have echoed this skepticism toward carbon capture. Florida Governor Ron DeSantis recently referred to carbon capture as a “scam” and described the GOP-led state legislature’s carbon sequestration task force as “embarrassing” and part of “climate ideology.”⁴⁶³ Several House Republicans advocated ending carbon capture subsidies altogether to ensure a total blow to Biden-era green industrial policy.⁴⁶⁴ The Trump administration has also cancelled \$3.7 billion in decarbonization funding (among many others), which specifically bolstered carbon capture in the industrial sector.⁴⁶⁵ These dynamics are not an accident, nor are they a reaction to frontline Republican communities’ response to CO₂ pipelines. They are a direct result of an emerging view of climate change from the American right: The storm is coming, but its winds are overstated. Fossil fuels are essential because they bring wealth and prosperity. In this view, fossil fuel externalities are worth the risk of planetary disruption.⁴⁶⁶

In the end, the second Trump administration and Republican Party have landed in support of carbon capture subsidies. The One Big Beautiful Bill Act, which repealed vast elements of the Biden-era Inflation Reduction Act, kept the carbon capture provisions intact.⁴⁶⁷ The Trump administration has not formally canceled the \$3.5 billion direct air capture hubs program, but mass layoffs at DOE and a freeze on funds have left the department stalled in limbo. With oversight staff being gutted and communications embargoed, projects face uncertainty, delays, or even potential collapse despite bipartisan and industry support.⁴⁶⁸

Controlling the Clouds

Technologically, geoengineering techniques are products of the post–world war era and trace their roots to American corporate and military endeavors. Speculation of the potential to alter the weather dates to the 1830s when an American meteorologist was hired by the U.S. Army to determine whether humans could stimulate the rain. These early studies were the building blocks for the U.S. Department of Agriculture’s attempts to develop a “rain machine” through detonating balloons of explosives to remediate the drought of the 1890s. By the 1920s, the military had again begun looking into these methods as a means of displacing fog for tactical incursions.⁴⁶⁹ Despite the failures of these early attempts, they nonetheless reveal how geoengineering research has long been driven by military ambition.

After the Second World War, geoengineering as known today began in earnest. Scientists at General Electric tested the first cloud seeding experiments to induce rainfall.⁴⁷⁰ As the Cold War ensued, military strategists on both sides of the Arctic began to investigate how the weather could be weaponized. (Albeit not from aerosol spraying but from other techniques: The Soviets, for example, wanted to build massive dams that could alter the ocean current

and Arctic Circle.)⁴⁷¹ The United States took the lead on proto-geoengineering technology, first with Project Stormfury, which started in 1962 and sought to weaken hurricanes, and later with Operation Popeye, a 1972 Air Force operation that sought to increase rainfall in Vietnam to suppress the geographical movement of the Viet Cong.⁴⁷² The public leaking of this second operation, along with Cold War concerns about geoengineering, triggered the United States and Russia to negotiate the first global framework on the militarization of weather, known as the Environmental Modification Convention (ENMOD).⁴⁷³

Geoengineering in Climate Politics and Nativist Movements

By 2006, geoengineering had entered the climate change conversation. An article from Nobel laureate Paul J. Crutzen legitimized geoengineering in climate science discourse by suggesting that solar radiation management might be an important area to research if carbon emissions were not abated.⁴⁷⁴ Until recently, most geoengineering techniques related to reflecting solar radiation remained theoretical and were not actively deployed.⁴⁷⁵ In 2010, the UN Convention on Biological Diversity issued the first large-scale moratorium on geoengineering—which the United States did not ratify.⁴⁷⁶ Traditional environmental organizations opposed geoengineering as an unproven technology with ripple effects that could risk harming vulnerable communities and violating principles of informed consent.⁴⁷⁷ By this point, environmental consensus on the political left was beginning to form against geoengineering as a hubristic and unreliable moral hazard.

The political left has not centered on geoengineering, and most examples of backlash in typical left-leaning constituencies reflect more direct community disaffection rather than broader ideological opposition. After Harvard scientists sought to explore releasing calcium carbonate in the Swedish Arctic, the Indigenous Sámi people objected, prompting the researchers to withdraw.⁴⁷⁸ In 2022, a network of Alaska Native leaders hosted a protest against a California-based geoengineering experiment seeking to spray synthetic silica into the atmosphere. The project was paused indefinitely.⁴⁷⁹ More recently, the progressive city of Alameda, California, voted to block local geoengineering experiments after one broke ground without the awareness of local politicians.⁴⁸⁰

Outside of the climate movement, geoengineering rapidly became intertwined with so-called chemtrails theories (which claim that contrail emissions from airplanes are creating adverse human health effects).⁴⁸¹ Although the lineage of the chemtrails theory can be traced back to an online essay on the early web, its popularity accelerated significantly in the 2010s, especially among independent voters.⁴⁸² In 2010, a small anti-geoengineering protest emerged in San Diego at the American Association for the Advancement of Science.⁴⁸³ In 2013, a demonstration took place at Redding City Hall in California when activists raised posters reading “Chemtrails Kill!!” and warned of an international plot to use climate-altering chemicals to harm mental and physical well-being.⁴⁸⁴ Since these select events took place, much of the activism related to chemtrails and geoengineering has escalated online and not on the streets.⁴⁸⁵ While these offline protests have been isolated and small-scale, online movements can yield notable potency in civil society.

In the past several years, these concerns about chemtrails have reemerged. Amid the rise of populist movements, theories have connected chemtrails with internationalist organizations that purportedly seek to control the weather. And while there have been few observed solely-geoengineering-focused protests to date, the subject has come to the fore as a rallying cry across both the MAGA and Make America Healthy Again (MAHA) coalitions. The mainstreaming of chemtrail theories is an indicator of an increasingly common political trend in the United States, where an issue once on the fringes now appeals to growing independent movements across political extremes.⁴⁸⁶ That said, these theories are finding a more fertile home in contemporary right-wing movements that fuse climate denial with anti-globalist rhetoric.

Now, for the first time, this anti-geoengineering ideology on the political right is directly influencing policy in the United States. Thus far, geoengineering has been outright banned by three states—Florida, Montana, and Tennessee—with similar bills now introduced across Kentucky, New Jersey, North Carolina, Pennsylvania, Rhode Island, and Texas.⁴⁸⁷ In total, twenty-two states have some form of anti-solar intervention legislation in the pipeline.⁴⁸⁸ The bills have been entirely put forth by Republican officials emboldened by the notion that chemtrails exist and that they are connected to nascent, early-stage climate intervention tests. Most recently, legislation put forth in Congress—known as the CLEAR Skies Act—would ban all types of weather modification including cloud seeding and solar radiation modification.⁴⁸⁹ The bill marks the first notable legislative action against climate intervention.

Despite lonely cries to continue to investigate geoengineering as a long-term climate solution from a less and less powerful political center, the technological approach does not seem to have many supporters in U.S. politics. The new Republican Party is increasingly of the mindset that climate interventions are a nonstarter, in line with some of its more severe, once-fringe beliefs. The Democratic Party, although more muted on geoengineering, has cautiously indicated approval of researching geoengineering techniques but has fallen short of setting up any programs.⁴⁹⁰ The lack of political appetite for this technology puts the U.S. government in a predicament: American startups are actively beginning to test geoengineering practices regardless of potential regulatory headwinds.⁴⁹¹ But without institutional understanding and smart regulations, the risks of deploying this sensitive technology remain unmitigated.

Future Intervention and Global Divergences

In the United States, geoengineering interventions and carbon capture are facing varying degrees of political and social backlash. But across the world, as summers get hotter, droughts grow more extreme, and pressure to decarbonize mounts, these technologies are not slowing down.

Interestingly, as the United States faces increasing tensions with its neighbors to the north and south, Canadian and Mexican politics have both reflected isolated examples of mistrust toward the geoengineering-related activities of American companies and the U.S. government. In Canada, anti-chemtrails advocates have been around for decades. Notable examples of prominent politicians divulging their support for these once-fringe ideas include the former premier of British Columbia filing information act requests to see if regional or federal governments were using chemtrails and, more recently, the premier of Alberta legitimizing the chemtrails theory by specifically suggesting the U.S. military was responsible.⁴⁹² Similar transboundary issues of trust emerged in Mexico: When a private U.S. company launched unauthorized solar geoengineering experiments in Baja, Mexico's Secretariat of Environment and Natural Resources issued a formal statement banning solar geoengineering projects on Mexican territory.⁴⁹³

Across the Atlantic and Pacific Oceans, both Europe and China are developing policies and experiments with these technologies. Despite opposition from notable NGOs and scientific communities, the EU is studying the social, engineering, and climatological challenges posed by geoengineering.⁴⁹⁴ However, European scientists have not raced to endorse geoengineering and remain pessimistic about its potential to genuinely mitigate the worst impacts of climate change (in addition to the unforeseen, adverse effects it may have).⁴⁹⁵ The UK has taken a slightly more aggressive approach by funding at least 57 million pounds (\$76 million) of small-scale geoengineering intervention pilots.⁴⁹⁶

China, by contrast, has been working diligently in this space for at least a decade. In 2015, the nation set an artificial rainfall target by 2020 to confront domestic water shortages.⁴⁹⁷ By 2020, the Chinese government announced it would be expanding its cloud seeding program fivefold to include new infrastructure, a weather modification system in the Qinghai-Tibet Plateau, and preparing the nation for an advanced level of weather modification by 2035.⁴⁹⁸ This year, China has successfully tested drones spraying silver iodine that were able to stimulate rainfall.⁴⁹⁹

Both Europe and China are also developing ambitious policies and infrastructure for carbon capture and storage (CCUS). Despite some pushback from climate NGOs and economists, the EU has embedded CCUS in its Green Deal Industrial Plan, funding large demonstration hubs in the North Sea and setting regulatory frameworks to certify permanent CO₂ storage.⁵⁰⁰ The UK has taken a similarly aggressive approach, rolling out multibillion-pound support for CO₂ transport and storage networks such as the East Coast Cluster and HyNet.⁵⁰¹ China, by contrast, has pursued CCUS mainly through its state-owned oil and coal giants. In its 14th Five-Year Plan, Beijing formally elevated CCUS as a national priority, targeting multiple industrial hubs for deployment, and in 2022 Sinopec launched what it called China's largest CCUS project at the Shengli oil field.⁵⁰² Some have even begun to speculate that the United States could, in the long term, lose its carbon capture industry advantage to China.⁵⁰³

Conclusion

The politics of climate intervention and carbon capture techniques in the United States reveal a deeper trend of decreasing trust in governance that extends beyond the conversation around the scientific merits or dangers of geoengineering and carbon capture. Both the new right and segments of the environmental left are converging in suspicion and hostility toward these frontier technologies—albeit for starkly different reasons. In some cases, genuine scientific reasons are prompting concern, while in others, unsubstantiated theories are driving backlash. While the U.S. outlook for carbon capture has muddled forward despite growing backlash, the political risks for geoengineering appear more severe. At present, these new politics have not yet interfered with developments—American oil majors are still developing CCUS, and startups are spraying chemicals into the air. But their futures could be precarious if current trends in this political climate persist.

Meanwhile, other powers may forge ahead—experimenting, regulating, and building the industrial capacities that could influence the future of climate management. Whether these interventions ultimately prove necessary or reckless, the United States could end up watching from the sidelines. In this vacuum, decisions about planetary-scale climate responses may shift to other actors, leaving America to reckon with the outcomes of choices it no longer has the power or institutional capacity to shape.

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