

100 billion dollar COP-out

**A critical analysis of the illusions and realities of
climate adaptation**

Nils Nerhus Rørstad

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Abstract

Climate adaptation has emerged as a central mechanism for addressing climate injustice, with wealthy nations pledging hundreds of billions in support for vulnerable countries. This thesis examines whether adaptation planning enables climate justice or reproduces colonial relations through new vocabularies. Through computational analysis of 45 National Adaptation Plans (NAPs) submitted to the UNFCCC, I reveal troubling patterns of epistemological homogenization that contradict adaptation’s stated aims.

Using structural topic modeling and a novel Dominance Index to measure discourse centralization, the analysis uncovers three key findings. First, despite facing radically different climate impacts, countries show remarkable convergence in how they conceptualize adaptation, with 32% of corpus-level discourse concentrated on financial mechanisms and institutional procedures. Second, this convergence is shaped more by regional institutional networks (explaining 20.1% of variance) than by actual climate vulnerabilities (explaining only 1.8%). Third, the patterns reflect the movement of consultants and frameworks that impose singular approaches across diverse contexts.

Drawing on critical theory, particularly concepts of epistemicide and post-development, I argue that adaptation planning operates as an “anti-politics machine” that transforms questions of justice into technical problems. Rather than enabling diverse responses based on local knowledge, the adaptation regime eliminates alternative epistemologies while appearing to provide assistance. This represents what the title captures as a “COP-out”—allowing Northern countries to avoid fundamental economic transformation while reshaping Southern societies through planning requirements.

The findings suggest that genuine climate justice requires not reformed adaptation planning but recognition of the autonomous strategies communities have always used to navigate environmental change. Until adaptation enables rather than eliminates

epistemological diversity, it will remain a mechanism for maintaining rather than transforming the relations that produce vulnerability.

Acknowledgements

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2 Introduction

“Very good, Dedra. That is verbatim from the ISB mission statement... and wrong. Security is an illusion. You want security? Call the Navy. Launch a regiment of troopers. We are healthcare providers. We treat sickness. We identify symptoms. We locate germs whether they arise from within or have come from the outside. The longer we wait to identify a disorder, the harder it is to treat the disease.”

—Major Partagaz, *Andor*

2.1 Competing Visions: From Security to Freedom

Major Partagaz’s chilling monologue to the Imperial Security Bureau captures a particular vision of governance that resonates far beyond the Star Wars universe. Society is a body that can fall ill. Experts are healthcare providers who diagnose symptoms and eliminate germs. Disorders must be identified and treated before they spread. This medical metaphor for social control—precise, technical, ostensibly neutral—finds its contemporary expression in the most unlikely of places: climate adaptation planning.

Across the globe, climate adaptation has become a universal imperative, yet the stories that drive it are strikingly diverse. In corporate boardrooms, executives declare “we need climate action to stay competitive in world markets.” Conservation organizations insist “we need climate action to save biodiversity.” In rural communities, farmers simply state “I need people to buy carbon credits so I can put food on the table.” These narratives—economic, ecological, existential—seem to demand

fundamentally different responses. A corporation’s competitiveness strategy should look nothing like a biodiversity protection plan, which in turn should differ from a smallholder’s survival strategy.

Yet when we examine how climate adaptation actually unfolds through formal planning processes, a puzzling pattern emerges. Countries facing radically different climate futures—small island states confronting rising seas, landlocked nations battling desertification, mountain kingdoms losing glaciers—produce remarkably similar adaptation plans. Their National Adaptation Plans, submitted to the United Nations Framework Convention on Climate Change (UNFCCC), converge on the same topics: institutional arrangements, financial mechanisms, capacity building, monitoring frameworks. The diversity of climate impacts meets the homogeneity of climate responses.

This convergence cannot be explained by shared environmental challenges, as the challenges themselves are profoundly different. Instead, the pattern points to something more systemic: the operation of what development anthropologists call the “Aidland” (Mosse 2011)—a transnational space where consultants, frameworks, and expertise circulate, creating standardized approaches to diverse problems. The same consulting firms work across multiple countries. The same templates structure different plans. The same indicators measure disparate realities. Like a traveling circus, this apparatus moves from capital to capital, performing the same show regardless of local context.

The consultant arrives in Dhaka or Dar es Salaam carrying frameworks developed in Washington or Geneva. They conduct stakeholder workshops, perform vulnerability assessments, and compile sector analyses. They translate complex local realities into standardized formats that international funders can recognize and process. Communities who have navigated environmental uncertainty for generations suddenly learn they lack “adaptive capacity.” Traditional practices that maintained resilience for centuries are rendered invisible, not through malice but through frameworks that simply cannot see them. The consultant’s toolkit—logical frameworks, results chains, theory of change diagrams—shapes not just how adaptation is planned but what adaptation can even mean.

This brings us to a radically different vision, offered by another

character from the same series:

“Freedom is a pure idea. It occurs spontaneously and without instruction. Random acts of insurrection are occurring constantly throughout the galaxy. There are whole armies, battalions that have no idea that they’ve already enlisted in the cause.”

—Nemik, *Andor*

Nemik’s manifesto presents freedom not as something to be planned, managed, or delivered, but as an emergent property of human existence. It occurs “spontaneously and without instruction”—outside the frameworks, beneath the radar, beyond the plans. This vision suggests that adaptation too might emerge not from technical assessments and institutional arrangements but from communities exercising their autonomy, drawing on their own knowledge, creating their own futures.

The tension between these visions—Partagaz’s technocratic control and Nemik’s spontaneous freedom—defines the contemporary climate adaptation regime. On one side, an apparatus that diagnoses vulnerability, prescribes interventions, and monitors compliance. On the other, the persistent reality of human communities who have always adapted to environmental change through their own knowledge systems, social arrangements, and creative responses. The question is not which vision is correct, but which is winning. When adaptation becomes legible to international institutions, what happens to the forms of adaptation that flourish outside their frameworks?

2.2 The New Underdevelopment: Vulnerability as Justification

To understand how climate adaptation operates today, we must recognize its lineage. In the twentieth century, the concept of “underdevelopment” transformed global relations. Suddenly, diverse societies pursuing different ways of life were repositioned on a single scale from “backward” to “advanced.” This was not a neutral description but an active construction that justified intervention. If a society was underdeveloped, it required development. If it lacked capacity, it needed technical assistance. If

it was traditional, it must be modernized. The development apparatus that emerged—with its experts, frameworks, and flows of capital—promised to deliver progress while often delivering dependency.

Today, “vulnerability” plays a remarkably similar role. Where once countries were diagnosed as underdeveloped, they are now assessed as vulnerable. Where development economists calculated GDP gaps, climate scientists now model exposure to extreme events. Where structural adjustment programs promised to fix economic deficiencies, adaptation projects now promise to address climatic ones. The vocabulary has changed, but the underlying structure persists: Southern deficiency requires Northern expertise.

The financial promises that accompany this new framing are substantial. At Copenhagen in 2009, developed countries pledged \$100 billion annually in climate finance by 2020—a figure that captured headlines and hope in equal measure. By COP29 in Baku in 2024, this had grown to a promise of \$300 billion annually by 2035. These sums suggest serious commitment to climate justice, a recognition that those least responsible for climate change should not bear its costs alone. Yet examining how this finance flows reveals troubling patterns.

The primary vehicle for adaptation planning under the UNFCCC is the National Adaptation Plan (NAP). These documents, now submitted by 45 countries, are meant to identify climate vulnerabilities and outline systematic responses. They serve as both planning tools and funding proposals, demonstrating need while showcasing capacity to manage resources. In practice, NAPs have become the new national development plans—comprehensive documents that must speak to multiple audiences, satisfy diverse requirements, and transform messy realities into neat project packages.

The parallel goes deeper than format. Just as development planning transformed political questions about global inequality into technical problems of resource allocation, adaptation planning transforms questions about climate justice into matters of project management. Why are coastal communities vulnerable to storm surges? A political analysis might point to histories of displacement that pushed populations to marginal

lands, industrial development that destroyed protective mangroves, or global economic systems that concentrate risk among the poor. But within the technical framework of adaptation planning, vulnerability appears as insufficient seawalls, inadequate early warning systems, or lacking evacuation plans. The prescription follows from the diagnosis: build barriers, install sirens, conduct drills.

This technical framing creates a profound paradox at the heart of climate adaptation. We face heterogeneous impacts: sea-level rise threatens to submerge entire nations while droughts desiccate others; hurricanes intensify in some regions while floods increase in others; glacial melt transforms mountain economies while coral bleaching devastates reef-dependent communities. These diverse impacts, one might expect, would generate diverse responses reflecting different contexts, priorities, and possibilities. Instead, we see homogeneous planning—the same institutional frameworks, financial mechanisms, and technical approaches appearing across radically different contexts.

The homogenization occurs not by accident but by design. To access climate finance, countries must make themselves legible to funding institutions. This requires adopting standardized frameworks, using recognized methodologies, and producing expected outputs. A vulnerability assessment must follow established protocols. A project proposal must fit logical frameworks. Success must be measurable through predetermined indicators. Countries learn to see themselves through these tools, to articulate their needs in these languages, to plan their futures within these constraints.

This represents what the title of this thesis captures in its double meaning: a COP-out. In one sense, it refers literally to an outcome of the Conference of Parties—the institutional response to demands for climate justice through adaptation finance. But in the colloquial sense, it represents an evasion of responsibility. While Southern countries reshape their societies through adaptation planning, Northern countries continue the emissions that drive climate change. While consultants design resilience projects in vulnerable communities, the systems producing vulnerability continue unabated. While adaptation finance flows (slowly and conditionally), the fossil fuel economy expands.

The genius of the adaptation regime is that it transforms moral and political questions into technical and financial ones. Rather than reparations for historical emissions, we have voluntary climate finance. Rather than binding commitments to rapid decarbonization, we have nationally determined contributions. Rather than addressing the structural drivers of vulnerability, we have project-based interventions. The result is a system that appears to address climate injustice while carefully avoiding anything that might require fundamental change in the global order.

What disappears in this transformation is precisely what Nemik’s vision of freedom suggests: the possibility that communities might adapt through their own knowledge, institutions, and aspirations rather than through externally designed projects. When adaptation is reduced to what can be planned, funded, and measured by international institutions, other forms of adaptation—those emerging spontaneously from human creativity and collective action—become invisible. This is not a failure of planning but its success: the rendering of diverse human responses to environmental change into standardized technical interventions that reinforce rather than challenge existing power relations.

2.3 Uncovering the Machinery: Questions, Methods, and Map

This thesis investigates the machinery of climate adaptation planning by examining what happens when 45 countries submit their National Adaptation Plans to the UNFCCC. These documents, running to thousands of pages collectively, represent the official articulation of how nations understand climate vulnerability and plan to respond. They are windows into possible futures—but whose futures, imagined how, and with what consequences?

To understand what these documents reveal, I pose three research questions that probe different dimensions of the adaptation regime:

First, how does climate adaptation planning conceptualize justice, and what possibilities does this enable or

foreclose? This question examines the implicit theories of justice embedded in adaptation discourse. When vulnerability is framed primarily as a technical deficiency requiring external expertise, what happens to questions of historical responsibility, reparations, or structural transformation? When justice is operationalized as resource transfer through project mechanisms, what forms of justice become unspeakable?

Second, through what mechanisms and whose knowledge do adaptation interventions become legitimate and necessary? This question investigates the knowledge politics of adaptation. How do certain ways of understanding vulnerability achieve dominance while others are marginalized? What role do consultants, frameworks, and institutional requirements play in shaping what counts as legitimate adaptation? When communities have adapted to environmental variability for generations, why do they suddenly need external experts to teach them adaptation?

Third, does the current adaptation regime advance climate justice or reproduce colonial relations under new vocabularies? This question directly confronts the claimed purpose of adaptation finance. If adaptation planning operates like Partagaz’s ISB—diagnosing disorders and prescribing treatments based on external expertise—does it enable Southern autonomy or deepen Northern control? When the same consultants apply the same frameworks across different contexts, are they supporting diverse adaptations or imposing singular visions?

To answer these questions, I employ a novel approach that makes visible patterns typically hidden in the sheer volume of policy documents. Using computational text analysis, specifically structural topic modeling, I identify the thematic patterns that structure adaptation discourse across all NAPs. This method reveals not just what individual countries say but how the collective discourse converges or diverges. The key innovation is the Dominance Index, a measure of discourse centralization that quantifies the degree to which adaptation planning concentrates on a narrow set of themes versus embracing diverse approaches.

When discourse is highly centralized—when most countries emphasize the same topics despite facing different challenges—it suggests the successful operation of homogenizing forces. When

discourse is decentralized—when countries pursue different thematic emphases—it indicates space for diverse approaches. By measuring centralization across different groupings (by income level, region, and geography), we can identify what factors shape adaptation discourse. Does shared vulnerability to sea-level rise create common discourse among small island states? Or do regional institutional networks have more influence than physical geography in shaping how adaptation is conceived?

This approach bridges critical theory and empirical analysis. It takes seriously the post-development critique that Northern frameworks eliminate Southern knowledge systems—what Boaventura de Sousa Santos calls “epistemicide” (Santos 2016). But rather than simply asserting this occurs, the analysis demonstrates it quantitatively, showing how adaptation discourse converges on particular framings while excluding others. The patterns revealed are not merely academic findings but windows into how power operates through seemingly neutral technical processes.

The theoretical contribution is to empirically validate critical perspectives on climate governance that have been developed through ethnographic and philosophical work. When Arturo Escobar argues that development discourse forecloses alternative futures (Escobar 1995), the convergence patterns in NAPs provide systematic evidence. When James Ferguson describes development as an “anti-politics machine” that transforms political questions into technical ones (Ferguson 1994), the dominance of procedural and financial topics in adaptation plans offers confirmation. The analysis shows these are not isolated cases but systematic patterns operating across the entire adaptation regime.

The methodological contribution is developing tools that can reveal the operation of power in large-scale governance processes. The Dominance Index makes abstract concepts like “epistemicide” empirically tractable. It shows not just that knowledge systems are marginalized but how this marginalization operates through the mundane processes of planning and documentation. This matters because what cannot be measured often cannot be contested. By making patterns of domination visible, we create possibilities for resistance.

The political implications are perhaps most significant. If adaptation planning operates as epistemicide—systematically elimi-

nating alternative ways of knowing and responding to environmental change—then current approaches are not merely inadequate but actively harmful. They eliminate the knowledge systems and social arrangements that enable genuine resilience while imposing frameworks that create new dependencies. Understanding these dynamics is essential for those seeking to support communities facing climate impacts without reproducing colonial relations.

This thesis unfolds in three parts that build from context through method to critique. Part I situates climate adaptation within the broader landscape of climate governance and development theory. Chapter 2 traces how adaptation emerged as a distinct pillar of the UNFCCC, examining the institutional arrangements, financial mechanisms, and power dynamics that shape contemporary adaptation governance. Chapter 3 reviews two competing perspectives on adaptation: the “adaptation nexus” approach that seeks technical solutions within existing systems, and the “adaptation regime” critique that sees adaptation as extending colonial relations through new vocabularies.

Part II develops the theoretical and methodological framework for analyzing adaptation discourse. Chapter 4 presents the theoretical foundations, drawing on work about epistemologies of the South, critical futures studies, and discourse analysis to understand how adaptation planning might reflect either epistemological diversity or monoculture. Chapter 5 details the methodology, explaining how structural topic modeling and the Dominance Index can reveal patterns of convergence and divergence in adaptation discourse.

Part III presents and interprets the empirical findings. Chapter 6 reports the results of analyzing 45 NAPs, showing high discourse centralization overall but important variations across income levels, regions, and geographic categories. Chapter 7 discusses these findings through the lens of critical theory, arguing that adaptation operates as contemporary epistemicide that forecloses alternative futures while maintaining colonial relations. The conclusion returns to the fundamental question of climate justice, arguing that genuine transformation requires not better planning but recognition of the multiple worlds that exist beyond adaptation frameworks.

Throughout this journey, the tension between Partagaz and

Nemik remains central. Can freedom occur spontaneously within climate governance, or does the machinery of adaptation planning successfully diagnose and eliminate alternatives before they can flourish? The evidence suggests that current approaches serve Partagaz’s vision all too well—identifying “disorders” in Southern societies and prescribing “treatments” that often worsen the underlying condition. Yet Nemik’s insight remains: freedom persists, emerging in the spaces that planning cannot reach, in the practices it cannot see, in the futures it cannot imagine. The question is whether these spaces of freedom can survive and expand, or whether the apparatus of adaptation will continue its work of rendering the world legible to power while eliminating the alternatives that might enable genuine transformation.

This thesis is ultimately about that struggle—between homogenization and diversity, between control and autonomy, between the futures that planning enables and those it forecloses. By making visible how adaptation discourse operates, we take a first step toward imagining how it might operate otherwise. If the current regime represents a COP-out that allows the North to avoid fundamental change while reshaping the South, then understanding its machinery is essential for those seeking genuine climate justice. The task is not to perfect the machinery but to recognize, as Nemik suggests, that real transformation may emerge not from our plans but from the freedom that persists despite them.

3 Context

Climate adaptation is becoming a central part of development governance, where the goal is to finesse the three pillars to get the optimal political economy outcome.

International climate change action is governed by the United Nations Framework Convention on Climate Change (UNFCCC), established at the Earth Summit in Rio de Janeiro in 1992. The Summit also created two other conventions, The Convention on Biological Diversity (CBD) and The United Nations Convention to Combat Desertification (UNCCD) (Hall and Persson 2018). Together, these frameworks established new institutional arrangements for addressing global environmental challenges.

Central to the UNFCCC is the principle of “Common but Differentiated Responsibilities” (CBDR), which acknowledges that while climate change affects all nations, industrialized countries bear greater historical responsibility for emissions and consequently should lead in providing solutions and support (Hall and Persson 2018). This principle has become a cornerstone of international climate negotiations, though its interpretation has evolved over time, particularly as the economic circumstances of various countries have changed.

The CBDR principle fundamentally shaped North-South dynamics in climate governance by establishing differential obligations between developed countries (listed in Annex I and II of the convention) and developing countries. This differentiation created a framework where industrialized nations were expected to take the lead in emissions reductions while also providing financial and technological support to developing countries (Persson and Remling 2014). These power relations have remained central to climate negotiations, even as the governance architecture has evolved to include adaptation and loss and damage alongside mitigation.

Climate governance has evolved through three distinct pillars: mitigation (established at Kyoto in 1997), adaptation (formalized at Cancun in 2010), and loss and damage (incorporated in the Paris Agreement in 2015). This evolution reflects growing recognition of climate impacts and the inadequacy of mitigation alone, while also revealing shifting North-South dynamics in how climate challenges are conceptualized and addressed (E. Roberts and Huq 2015).

The adaptation funding landscape includes various mechanisms such as the Green Climate Fund, Adaptation Fund, and the Rio markers system for tracking adaptation finance. Despite pledges like the “\$100 billion promise” and the recent \$300 billion commitment at COP29 in Baku (2024), actual disbursement patterns reveal significant shortfalls and geographical and sectoral imbalances (Stern, Songwe, and Bhattacharya 2022; CPI 2023). These financial frameworks involve complex interactions between public and private financing models, multilateral development banks, bilateral donor frameworks, national governance structures, and non-state actors.

3.1 Mitigation

Climate mitigation emerged as the first pillar of climate governance, establishing North-South power dynamics through differential responsibilities that would later shape adaptation approaches.

The Kyoto Protocol, adopted in 1997, established climate mitigation as the first pillar of the UNFCCC. The protocol set the goal of keeping greenhouse gas levels below what was deemed dangerous to the biosphere, with emissions reductions primarily assigned to industrialized countries in recognition of their historical responsibility (Hall and Persson 2018). The Kyoto Protocol set legally binding emissions reduction targets for 37 industrialized countries and economies in transition, with an average reduction of 5.2% from 1990 levels to be achieved by 2012.

This approach established a key North-South dynamic in climate governance: developed countries would take the lead in emissions reductions, while developing countries were granted space to pursue economic development without

binding emissions targets. This differentiation was justified on both historical responsibility for emissions and the principle of equity, recognizing developing countries' legitimate development needs and lower capacity to reduce emissions (Hall and Persson 2018).

The Kyoto Protocol also created market mechanisms for carbon trading, called "Flexibility mechanisms," where emissions could be traded from developing countries to industrialized countries (Peskett, Schreckenber, and Brown 2011). These mechanisms included Emissions Trading, the Clean Development Mechanism (CDM), and Joint Implementation (JI). The CDM in particular became a significant channel for North-South cooperation, allowing developed countries to implement emission-reduction projects in developing countries and earn certified emission reduction credits.

Through these mechanisms, developing countries that were under no obligation to cut their emissions could sell carbon credits to industrialized nations with reduction obligations (Peskett, Schreckenber, and Brown 2011). This approach was designed to reduce the overall costs of meeting mitigation targets while providing sustainable development benefits to host countries. However, the geographic distribution of CDM projects was uneven, with the majority concentrated in larger emerging economies like China, India, and Brazil, while least developed countries, particularly in Africa, hosted relatively few projects.

These patterns revealed how market-based approaches to climate governance could reproduce existing economic disparities rather than challenging them. The concentration of CDM projects in more industrialized developing countries reflected and reinforced global patterns of investment, with the poorest countries largely excluded from participation in carbon markets despite their greater vulnerability to climate impacts (Dunlap 2018).

The Paris Agreement, adopted at COP21 in 2015, marked a significant shift in the mitigation approach. Rather than maintaining the strict binary between developed and developing country obligations, Paris introduced a universal framework where all countries contribute through "nationally determined contributions" (NDCs) while still acknowledging differential capabilities

and responsibilities (Hall and Persson 2018). This hybrid approach attempted to resolve long-standing tensions in climate governance by allowing countries to determine their own contributions based on national circumstances while maintaining the principle of common but differentiated responsibilities.

However, this flexibility came at the cost of ambition, with the first round of NDCs collectively putting the world on track for approximately 3°C of warming rather than the Agreement’s 1.5-2°C goal. This ambition gap has reinforced critiques that the climate regime prioritizes political feasibility and consensus over the transformative action needed to address the scale of the climate crisis (Williams 2020).

3.2 Adaptation

Adaptation evolved from a peripheral concern to a central pillar as climate impacts became unavoidable, creating a distinctive site where North-South relations materialize through funding mechanisms and institutional arrangements.

As the targets set in the Kyoto protocol proved inadequate to prevent significant climate impacts, and as governments faced resistance to ambitious mitigation measures, climate adaptation gradually gained prominence in the climate regime (E. Roberts and Pelling 2018). This shift emerged from growing recognition that even with ambitious mitigation efforts, some climate impacts were already occurring and others were inevitable, necessitating organized adaptation efforts.

The development of adaptation within the UNFCCC progressed gradually before its formal establishment as a pillar. Early efforts included the 2001 establishment of the Least Developed Countries Fund (LDCF) and Special Climate Change Fund (SCCF) under the Global Environment Facility, as well as the Adaptation Fund under the Kyoto Protocol (Persson and Remling 2014). These initial funding mechanisms established institutional arrangements that would shape North-South relations in adaptation governance, with developed countries providing finance that developing countries could access through specific procedures and criteria.

The Cancun Adaptation Framework, adopted at COP16 in 2010, formally established adaptation as the second pillar of climate governance. It created several important mechanisms, including the Adaptation Committee to promote coherent implementation of adaptation actions, the process for formulating and implementing National Adaptation Plans (NAPs), and approaches to address loss and damage (Mizuno and Okano 2024). This framework represented a significant step forward in balancing adaptation and mitigation within the climate regime.

Climate adaptation measures vary significantly across contexts. In industrialized countries, adaptation often focuses on managing surface runoff and in low-lying countries, addressing sea-level rise and storm surges through a mix of infrastructure modifications and ecosystem-based approaches (Hall and Persson 2018). However, in developing countries, adaptation intersects with broader development challenges, including poverty reduction, food security, water management, disaster risk reduction, and public health. The boundaries between adaptation and development are often blurred, leading to debates about “adaptation mainstreaming” versus transformative approaches to adaptation (Ireland and McKinnon 2013).

These different conceptualizations of adaptation reflect underlying North-South dynamics in climate governance. Adaptation in developed countries is typically framed as a technical challenge of adjusting infrastructure and systems to changing climate conditions. In contrast, adaptation in developing countries is often framed within broader development narratives, positioning climate vulnerability as intertwined with development challenges (Scoville-Simonds, Jamali, and Hufty 2020). This framing both reflects and reinforces power dynamics where Northern institutions define what counts as legitimate adaptation and how it should be implemented.

The adaptation funding landscape further materializes North-South relations through specific institutional arrangements and power dynamics. The adaptation financing architecture includes the Adaptation Fund (established under the Kyoto Protocol), the Least Developed Countries Fund, the Special Climate Change Fund, and the Green Climate Fund (Persson and Remling 2014). Despite the multiple funding channels, adaptation finance has consistently lagged behind mitigation finance, creating tensions in international negotiations. The Green Climate Fund, established in 2010 and operationalized in 2015,

has a mandate to balance its funding between mitigation and adaptation, but has struggled to achieve this balance in practice.

Adaptation funding is further complicated by challenges in defining and measuring adaptation outcomes, attributing climate impacts, and ensuring funds reach the most vulnerable communities (Persson and Remling 2014). The absence of universally agreed metrics for assessing adaptation effectiveness—unlike mitigation, where greenhouse gas emissions provide a common metric—creates challenges for prioritizing investments and demonstrating results. These measurement challenges are not merely technical but reflect deeper questions about what counts as successful adaptation and who gets to define success.

The adaptation governance landscape is further complicated by its multi-level nature, with actions required at global, regional, national, and local scales. International frameworks provide guidance and resources, but adaptation is inherently context-specific, requiring localized assessment of vulnerabilities and appropriate responses (Ireland 2010). This creates challenges for coherence across scales and for ensuring that global policies and financing mechanisms effectively support local adaptation needs. The tension between global standardization and local specificity reflects broader dynamics in North-South relations, where Northern-dominated international institutions establish frameworks that may not adequately reflect the diverse realities and priorities of communities in the Global South.

3.3 Loss and damage

Loss and damage represents the recognition that some climate impacts exceed adaptation limits, introducing contested questions of liability and compensation that directly challenge conventional development frameworks.

Loss and damage emerged as the third pillar of climate governance in recognition that some climate impacts exceed the limits of adaptation, particularly for the most vulnerable nations (E. Roberts and Huq 2015). The concept gained prominence in UNFCCC negotiations as new scientific evidence accumulated

and activism from small island developing states highlighted that some nations could face existential threats due to sea level rise and other severe climate impacts.

The historical development of loss and damage reveals the contested politics of climate responsibility and liability. The Alliance of Small Island States (AOSIS) first proposed an international insurance pool for loss and damage from sea-level rise in 1991, well before the UNFCCC was established (E. Roberts and Huq 2015). However, the concept only gained significant traction two decades later, with the establishment of the Warsaw International Mechanism for Loss and Damage in 2013, and its subsequent incorporation into Article 8 of the Paris Agreement (Toussaint 2021). This long struggle reflects persistent resistance from developed countries concerned about liability and compensation claims, with the United States in particular insisting on language in the Paris Agreement explicitly stating that Article 8 “does not involve or provide a basis for any liability or compensation” (Vanhala and Hestbaek 2016).

Loss and damage is conceptualized in two primary ways, each with distinct implications for North-South relations. First, it can be understood as a form of legal process within domestic courts or under the UNFCCC umbrella. Through this process, damages from a climate-related event are calculated, the contribution of climate change to the event is established, the responsibility for emissions is attributed, and the damages are compensated (Wallimann-Helmer 2023). This approach draws on principles of international environmental law, particularly the “polluter pays” principle and the concept of state responsibility for transboundary harm.

Climate attribution science has advanced significantly in recent years, with methodologies now able to quantify the extent to which climate change has increased the likelihood or intensity of specific extreme events (Williams 2020). This scientific progress strengthens the potential for legal approaches to loss and damage, though significant challenges remain in establishing causation chains from emissions to specific damages and in allocating responsibility among multiple emitters over time.

The second conceptualization frames loss and damage as a form of risk management, where risk is reduced through adaptation measures, transferred through insurance schemes, and retained through resilience measures (Mechler et al. 2020).

This approach includes both economic and non-economic losses, with the latter encompassing losses of culture, identity, territory, and indigenous knowledge that cannot be readily monetized. Insurance-based approaches have gained particular traction, with initiatives like the InsuResilience Global Partnership aiming to provide climate and disaster risk finance and insurance solutions to vulnerable people.

These competing conceptualizations reflect fundamental tensions in North-South relations regarding climate responsibility. The legal/compensation framing directly challenges conventional development frameworks by asserting that historical emitters bear responsibility for climate damages, introducing questions of liability that industrialized countries have consistently resisted (Vanhala and Hestbaek 2016). The risk management framing, while less politically contentious, may depoliticize loss and damage by shifting focus from historical responsibility to technical solutions, potentially reinforcing rather than challenging existing power dynamics.

A breakthrough in loss and damage governance came at COP27 in Sharm el-Sheikh with the establishment of funding arrangements for loss and damage, followed by the operationalization of the Loss and Damage Fund at COP28 in Dubai (Janzen et al. 2021). These developments represent significant progress, though questions remain about the fund's size, who contributes, who can access it, and under what circumstances. Initial pledges totaled approximately \$700 million—far below estimates of loss and damage costs, which range from \$290-580 billion annually by 2030 for developing countries alone.

The evolution of loss and damage governance illustrates how North-South power dynamics shape climate governance even as new institutional arrangements emerge. While developed countries have reluctantly accepted the principle of providing support for loss and damage, they have consistently worked to avoid language around compensation or liability that could create legal obligations based on historical emissions (E. Roberts and Pelling 2018). Meanwhile, vulnerable countries continue to advocate for frameworks that acknowledge historical responsibility and provide predictable, adequate finance for addressing loss and damage.

These tensions are not merely rhetorical but have material consequences for how loss and damage is addressed and funded.

The framing of loss and damage as either a matter of justice and compensation or as a technical challenge of risk management shapes which interventions are prioritized, how resources are allocated, and ultimately who bears the costs of climate impacts that cannot be avoided through mitigation or adaptation (Vanhala and Hestbaek 2016).

3.4 UNFCCC Negotiations

UNFCCC adaptation negotiations reveal fundamental tensions between technical framing and justice concerns, with ambiguous language and procedural complexity often masking power imbalances in how adaptation is conceptualized and funded.

The UNFCCC understands climate damages, all the negative effects of climate change, as a kind of spillover effect. Unmitigated emissions lead to damages, unadapted damages causes losses that have to be compensated. Since the UNFCCC, like most international agreements, is negotiated by countries that have to balance their need for strong policy action and future uncertainty, the process is ambiguous (Hall and Persson 2018). This ambiguity manifests in deliberately vague language that can accommodate divergent interpretations, allowing countries with different positions to claim the agreement supports their view.

UNFCCC negotiations involve complex interactions between different country groupings with varying interests and capabilities. These include the G77 and China (representing over 130 developing countries), the Least Developed Countries (LDCs), the Alliance of Small Island States (AOSIS), the European Union, the Umbrella Group (including the US, Japan, Australia and others), and the Environmental Integrity Group (Hall and Persson 2018). These coalitions provide developing countries with greater negotiating power than they would have individually, though the diverse interests within groups like the G77 can create internal tensions.

The dynamics within these negotiations reflect broader power imbalances in the international system. Technical complexity, language barriers, delegation size disparities, and limited institutional capacity create challenges for many developing

countries, despite formal procedural equality (E. Roberts and Pelling 2018). Civil society organizations often provide technical support to vulnerable country delegations, while also using various forms of advocacy to influence the negotiation process. The private sector, particularly fossil fuel industries, also exercises significant influence, both through direct lobbying and by shaping national positions of major economies.

Many see the relationship between climate action and economic growth as opposites, resisting binding agreements and preferring unsubstantiated goals. This tension often manifests in debates over the scale and nature of economic transformation required to address climate change effectively. Economic analyses have traditionally framed climate policy as imposing costs that must be weighed against the benefits of avoided damages, with models typically showing modest optimal carbon prices that increase gradually over time (Hall and Persson 2018).

The Convention has room for multiple interpretations of most aspects of it, and there are two main ways of understanding the relation between the pillars. The first one is that the goal is to *minimize the damage* as much as possible by mitigating as much as possible, and that adaptation and loss and damage are there as a safety precaution. This perspective, often advanced by developed countries and mainstream economic analyses, emphasizes maximizing mitigation efforts to reduce the need for adaptation and loss and damage measures.

The second is that there exists an *optimal combination of mitigation, adaptation, and loss and damage* that uses the resources more efficiently. This view, grounded in economic efficiency logic, suggests balancing investments across all three pillars based on cost-benefit analyses that consider the marginal returns to different types of climate action (Mechler et al. 2020). It recognizes that some level of climate change is already unavoidable, making adaptation necessary regardless of mitigation efforts, and that in some cases, adaptation may be more cost-effective than extremely expensive mitigation options.

This economically-oriented framing has been criticized for several reasons. First, it tends to obscure questions of justice and equity by focusing narrowly on aggregate costs and benefits without adequate attention to their distribution. Second, it struggles to account for non-economic values, including cultural heritage, biodiversity, and human lives, that cannot be readily

monetized. Third, it typically applies high discount rates that effectively devalue future impacts, raising intergenerational equity concerns (Williams 2020).

Beyond these economic frameworks, some scholars and activists argue for rights-based or justice-oriented approaches that prioritize the needs and perspectives of those most vulnerable to climate impacts, regardless of economic efficiency calculations (E. Roberts and Pelling 2018). These approaches emphasize historical responsibility for emissions, procedural justice in decision-making, and recognition of diverse values and knowledge systems.

Indigenous perspectives offer yet another framing that often emphasizes relationships, reciprocity, and responsibilities to future generations and non-human beings. These approaches typically involve more holistic understandings of climate change that situate it within broader patterns of colonialism, extraction, and disruption of Indigenous relationships with lands and waters (Ireland and McKinnon 2013).

These diverse perspectives on the relationship between mitigation, adaptation, and loss and damage reflect broader tensions in climate governance between technocratic approaches that seek optimal policy designs and more political approaches that emphasize power, justice, and competing values. The integration of these three pillars continues to evolve, with ongoing debates about their proper balance, financing, and implementation. As climate impacts intensify and the window for limiting warming to 1.5°C narrows, these discussions take on increasing urgency within and beyond the UNFCCC process.

4 Literature review

The literature on climate adaptation is divided between the adaptation nexus approach that emphasizes technical solutions within existing systems and the adaptation regime critique that views adaptation discourse as a technique of power reinforcing rather than challenging global inequalities.

As mentioned in the previous chapter, this section presents the two main strands of climate adaptation research. One is sympathetic, the adaptation nexus, while the other is critical, the adaptation regime. Climate adaptation is concerned with vulnerability to climate damages, and the main disagreement is in the production of vulnerability.

The literature in this field maps onto broader debates in development studies, where the study of interventions in other societies has a long theoretical history. These competing paradigms reveal fundamentally different understandings of what adaptation is, how vulnerability is produced, and consequently, what appropriate interventions look like.

The adaptation nexus approach builds on conceptual foundations in participatory development, drawing from the work of scholars like Chambers and Freire. It focuses on assets, endowments, and capabilities as articulated by Sen, employing analytical frameworks such as sustainable livelihoods and vulnerability assessments. Methodologically, this approach favors participatory rural appraisal and knowledge co-production. Key institutional supporters include UNDP and the World Bank, which promote synergistic sector approaches that seek to address multiple development challenges simultaneously through adaptation interventions (Ireland 2010).

In contrast, the adaptation regime paradigm emerges from post-structural critiques of development by scholars such as Escobar and Ferguson. It introduces key concepts like environmentality

(Agrawal 2005) and the adaptation regime (Paprocki 2018), critically analyzing adaptation discourse as a technique of power. This paradigm employs ethnographic and discourse analysis methods, drawing extensively on case studies from Bangladesh and other climate “hotspots” to illustrate how adaptation can function as mere “spice” for conventional development projects, leading to maladaptation that may exacerbate vulnerability (Dewan 2022).

4.1 Adaptation Nexus

The adaptation nexus approach builds on development traditions to frame adaptation as a technical challenge requiring synergistic sector interventions, emphasizing assets, capabilities, and institutional adjustments within existing systems.

The adaptation nexus approach has its roots in participatory movements in the 1990s, critiquing the then paradigm of top-down development research and practice, preoccupied with governmental institutions (Freire 1970; Chambers 1994). The participatory turn emerged as a response to decades of failed development interventions that imposed external solutions without understanding local contexts or incorporating local knowledge. Paulo Freire’s critical pedagogy emphasized dialogue and conscientization as alternatives to what he termed the “banking model” of education and development, where experts simply deposited knowledge into supposedly empty vessels (Freire 1970). Robert Chambers similarly challenged development professionals to examine their biases and recognize the value of local expertise, famously advocating for “putting the last first” (Chambers 1994).

The researcher was not to observe and report, but had the ethical responsibility to include and empower the communities they researched (Desai and Potter 2006). This ethical reorientation reflected broader epistemological shifts in development studies, recognizing multiple ways of knowing and the value of situated knowledge. Researchers were encouraged to view themselves as facilitators rather than experts, working alongside communities to co-produce knowledge rather than extracting data for academic purposes.

New methods were developed to better map communities and engage them in knowledge production, such as participatory rural appraisal. These methodologies included techniques like transect walks, community mapping, seasonal calendars, and wealth ranking exercises that enabled communities to visualize and analyze their own situations (Chambers 1994). Unlike conventional survey techniques that often reinforced power differentials, these approaches were designed to be accessible to non-literate participants and to foster collective analysis.

The data collected was used with new analytical framework centering the individual and communities. These frameworks analyzed how livelihoods were stitched together with a mix of assets, endowments, capabilities (Sen 2000), shaped by access (J. C. Ribot and Peluso 2003) and aspirations (Appadurai 2004), amongst others.

Amartya Sen's capabilities approach similarly shifted focus from resources or income to what people can actually do and be with those resources (Sen 2000). By emphasizing capabilities rather than commodities, this framework highlighted how the same resources might translate into very different outcomes depending on various conversion factors, including personal characteristics, social arrangements, and environmental conditions.

Jesse Ribot's theory of access complemented these frameworks by examining the mechanisms through which people gain, control, and maintain access to resources (J. C. Ribot and Peluso 2003). This approach went beyond formal property rights to consider how access is shaped by technology, capital, markets, labor, knowledge, authority, identity, and social relations. By highlighting these multiple mechanisms, Ribot's work helped explain why formal rights often fail to translate into actual benefits for marginalized groups and how power operates in resource governance.

This gave valuable insight into how societies functioned, and sparked new forms of interventions, with a focus on co-management and knowledge transfer. Community-based natural resource management emerged as one application of these insights, based on the premise that local users with secure rights over resources would manage them more sustainably than distant state authorities (Agrawal 2005). Co-management approaches similarly sought to establish partnerships between

local communities and state or non-state actors in resource governance, recognizing that neither complete centralization nor complete decentralization was optimal in most contexts.

These approaches were not without criticism. Some scholars argued that participatory methods could be co-opted by powerful actors, reinforcing rather than challenging existing power structures. Others noted that an uncritical focus on “the local” might romanticize communities and obscure internal divisions along lines of gender, class, caste, or age. Nevertheless, these frameworks and approaches represented an important shift in development thinking toward more contextually sensitive and participatory approaches.

This strand of research has since become a part of the mainstream development discourse, and variations on the participatory methods being implemented by the largest aid organizations like the World Bank. The World Bank’s adoption of “community-driven development” approaches in the early 2000s represented a significant institutionalization of participatory methods, with billions of dollars channeled through programs emphasizing community control over planning decisions and resources. Similarly, the United Nations Development Programme incorporated community-based adaptation into its climate programming, emphasizing local knowledge and decision-making while providing technical and financial support (Ensor and Berger 2009).

They see climate adaptation as just one policy area amongst all the others, and is searching for some key sectors and for synergies between them (Ireland 2010). This “mainstreaming” approach seeks to incorporate adaptation considerations into existing development planning and sectoral policies rather than treating adaptation as a standalone issue. Proponents argue that mainstreaming promotes efficiency, sustainability, and coherence across different policy domains. Key sectors typically identified for adaptation mainstreaming include agriculture, water management, health, disaster risk reduction, and infrastructure.

The search for synergies between adaptation and other policy objectives has been particularly prominent in discussions of “co-benefits,” where interventions simultaneously advance adaptation goals while yielding benefits in areas such as mitigation, biodiversity conservation, or poverty reduction (Almenar et al.

2021). This emphasis on multiple benefits aligns with the efficiency logic of mainstream development institutions and responds to the reality of limited resources for addressing multiple challenges.

One example of this could be tree planting projects, that while their main purpose is carbon sequestration, the project could contribute in many ways:

- Economic security through the sale of forest carbon credits to the global north. If the tree is planted as a part of a farming system as a form agroforestry, the wood could be seen as a form of long-term investment that could be harvested in 30 years
- Food security through production of fruit
- Gender equality by giving the responsibility for managing the trees to women
- Environmental security by providing shade with leaves and reduce soil erosion with roots (Almenar et al. 2021).

This example illustrates the nexus approach’s emphasis on finding interventions that address multiple objectives simultaneously. By framing tree planting as contributing to climate mitigation, adaptation, economic development, gender equality, and environmental protection, proponents can appeal to diverse stakeholders and funding sources. Similar multi-purpose framings can be found in integrated water resource management, climate-smart agriculture, and ecosystem-based adaptation.

The nexus understanding sees vulnerability as an individual’s *lack* of certain skill, capability, or access to a resource. When the right resource is given, it is expected to start an upwards spiral, where outcomes will improve in all other fields as well (Schipper 2020). This conceptualization of vulnerability focuses on characteristics of individuals or communities that make them susceptible to harm, such as limited assets, poor infrastructure, or weak institutions. It tends to frame vulnerability as a condition rather than a process, emphasizing what people lack rather than examining how and why they came to lack these resources or capabilities.

This framing has been criticized for its tendency to depoliticize vulnerability by focusing on technical solutions without addressing the structural factors that create vulnerability in the first

place. Critics argue that by framing vulnerability as primarily a problem of individual or community capacity, the nexus approach may inadvertently place responsibility for adaptation on those with the least resources and power to transform the systems that produce vulnerability (Eriksen et al. 2021).

Moreover, the emphasis on synergies and win-win solutions may obscure difficult trade-offs and competing interests that are inherent in adaptation decision-making. Not all stakeholders will benefit equally from particular adaptation interventions, and some may even be harmed. The nexus approach's tendency to emphasize positive synergies may inadequately prepare practitioners for navigating these difficult trade-offs and power dynamics (J. Ribot 2013).

Despite these critiques, the adaptation nexus approach remains highly influential in both research and practice, particularly among major development institutions and funding agencies. Its practical orientation, compatibility with existing institutional structures, and promise of addressing multiple objectives simultaneously contribute to its continued dominance in mainstream adaptation discourse.

4.2 Adaptation Regime

The adaptation regime critique draws from post-structural analysis to reveal how adaptation discourse functions as a technique of power that constructs vulnerability in ways that legitimize conventional development interventions while foreclosing alternative futures.

The adaptation regime has its roots in the deconstructionist anthropology of development (Lewis and Mosse 2006). It is heavily influenced by post-structuralism, and critiques of the *discourse of development*. The discourse is analyzed as “a system of knowledge practices, technologies, and power relationships” that orders the relationships between people and institutions (Lewis and Mosse 2006, 4). This approach draws from post-structural theory, particularly concepts of discourse, governmentality, and biopolitics, to analyze how power operates through knowledge production and institutional practices.

Central to this perspective is the understanding of discourse not simply as language but as a system that structures what can be thought, said, and done in a particular domain. Discourses establish “regimes of truth” that determine what counts as valid knowledge and who is authorized to speak it. From this perspective, development discourse constructs its objects (underdevelopment, poverty, vulnerability) in ways that simultaneously create the need for intervention and position certain actors (experts, development institutions) as uniquely qualified to intervene (Escobar 1995).

The discourses that order the relationships between rich and poor countries change over time, and development had replaced civilization, just as civilization had replaced God before it (Ferguson 1994).

Escobar traced how development discourse constructed the “Third World” as an object of knowledge and intervention, establishing relationships of power between experts and those to be “developed” (Escobar 1995). He documented how development institutions, from the World Bank to bilateral aid agencies to NGOs, produce and disseminate knowledge about developing countries that reinforces certain ways of seeing and intervening while marginalizing others. This knowledge production constitutes a form of power that shapes what interventions are considered legitimate, what outcomes are valued, and whose expertise counts.

Ferguson’s ethnographic study of development in Lesotho demonstrated how development interventions, even when failing to achieve their stated objectives, successfully expand bureaucratic state power and depoliticize poverty by rendering it a technical problem rather than a political one (Ferguson 1994). His concept of the “anti-politics machine” highlights how development discourse systematically represents poverty and underdevelopment as technical problems requiring technical solutions, effectively sidelining questions of politics, power, and structural inequality. By framing complex political-economic realities as technical challenges amenable to expert intervention, development discourse limits the space for radical alternatives and reinforces existing power relations.

Rather than seeking better development, post-development scholars called for alternatives to development—approaches

that break with the epistemological and institutional frameworks of conventional development and create space for diverse ways of knowing and being (Escobar 2018). This perspective emphasized the importance of local, indigenous, and non-Western knowledge systems and practices that had been marginalized by dominant development discourse.

As nature and climate discourses grew to prominence, Agrawal (2005) argued that the new relationships should be understood as a form of *environmentality*. Adapting Foucault’s concept of governmentality to environmental contexts, Agrawal examined how environmental governance regimes produce new kinds of environmental subjects who come to care about and act toward the environment in new ways. His ethnographic study of forest councils in Kumaon, India, demonstrated how participation in new regulatory regimes transformed local residents’ subjectivities and relationships to forest resources over time.

This concept of environmentality provided a theoretical bridge between Foucauldian analyses of development and emerging critiques of environmental governance. It highlighted how environmental interventions, like development projects, operate not simply through coercion but through reshaping how people understand themselves and their relationships to the natural world. This perspective is particularly relevant for understanding climate adaptation, which often involves similar processes of knowledge production, subject formation, and governance at multiple scales (Agrawal 2005).

Paprocki (2018) describes it as an *Adaptation regime* based on her field work in Bangladesh. She argues that some countries are constructed as climate vulnerable and therefore in need of climate adaptation and that this imaginary is closely related to other historical processes of colonialism. Through careful ethnographic work in coastal Bangladesh, Paprocki documents how a diverse set of actors, including government officials, NGO workers, scientists, and donor agency representatives, collectively produce knowledge about climate vulnerability that justifies particular kinds of interventions while foreclosing others.

This production of Bangladesh as the “ground zero” of climate change operates through what Paprocki terms “anticipatory ruination”—the rendering of certain places as already lost, which justifies radical interventions that might otherwise

face resistance. This discursive production of climate vulnerability is not politically neutral but aligned with particular development visions that privilege urbanization, export-oriented growth, and market-based solutions over rural livelihoods and communities (Paprocki 2018).

All societal issues are reduced to be climate related, and unavoidable (Hulme 2011). This dystopian imaginary builds the groundwork for extensive experimentation, since the dystopian outlook eliminates the possible downsides. This “climate reductionism” transforms complex social, economic, and political challenges into technical problems of climate vulnerability, effectively depoliticizing issues like poverty, inequality, and land rights. By framing climate impacts as inevitable and beyond human control, the adaptation regime eliminates the space for questioning whether particular interventions are necessary or desirable, or whose interests they serve (Paprocki 2018).

This, she argues, leads to dispossession as land is taken for shrimp aquaculture and migration to the cities is promoted. The poor and vulnerable that were supposed to be helped, simply are not (Paprocki 2018). Paprocki documents how adaptation interventions in coastal Bangladesh have facilitated a transition from rice farming to export-oriented shrimp aquaculture, displacing smallholder farmers and agricultural laborers. This dispossession is justified in the name of climate adaptation, with shrimp farming presented as more viable in a climate-changed future despite its negative social and environmental impacts.

Dewan (2022) further develops this, highlighting the building of dams and polders as flood protection. She argues the polders built as a climate adaptation measure, are the same as the old for flood protection, and are successful at acquiring funding. Climate adaptation was *the spice* that made their applications for funding work. The only issue was that the polders did not work. By blocking the seasonal flooding and draining, the rivers became silted and needed dredging, furthering the risk of floods.

Dewan’s analysis illustrates how the adaptation regime recycles old development interventions under new climate adaptation labels. Polders (embankments designed to protect low-lying land from flooding) had been constructed in Bangladesh since the 1960s, with mixed results. Yet rather than learning from these

experiences, similar interventions were repackaged as climate adaptation to access new funding streams. This “adaptation as spice” phenomenon reveals how the climate adaptation label is used to legitimize and secure funding for interventions that might otherwise face scrutiny or resistance (Dewan 2022).

Moreover, Dewan shows how these interventions often fail on their own terms, creating new vulnerabilities rather than reducing existing ones. By disrupting natural hydrological processes, the polders contributed to river siltation, waterlogging, and increased flood risk—precisely the problems they were supposed to address. This pattern of maladaptation highlights the limits of technical approaches that fail to engage with complex social-ecological systems and the knowledge of those who inhabit them (Dewan 2022).

The adaptation regime critique extends beyond Bangladesh to other contexts where similar dynamics operate. In the Pacific, scholars have documented how the construction of small island states as inevitably disappearing due to sea level rise has justified interventions focused on migration rather than supporting communities’ desires to remain and adapt in place. This “drowning islands” discourse constructs Pacific Islanders primarily as future climate refugees, obscuring their agency, resilience, and ongoing adaptation efforts. It also shifts attention from the responsibilities of high-emitting countries to reduce emissions to the supposed inevitability of displacement (Janzen et al. 2021).

Across diverse contexts, similar patterns emerge of vulnerability being constructed in ways that align with existing development paradigms rather than challenging them. Adaptation interventions reproduce rather than transform the political-economic relations that generate vulnerability in the first place. The adaptation regime operates not through simple imposition but through the production of knowledge, subjects, and governance arrangements that make particular approaches seem natural, necessary, and inevitable.

Critics have also examined the role of visualization technologies and media representations in producing the adaptation regime’s dystopian imaginaries. Climate models, vulnerability maps, and disaster photography together constitute seemingly objective perspectives that mask their partial and situated nature. These visual technologies produce certain places and pop-

ulations as exceptionally vulnerable, justifying interventions by external experts while often marginalizing local understandings of environmental change and appropriate responses (Scoville-Simonds, Jamali, and Hufty 2020).

The adaptation regime critique does not deny the reality of climate impacts or the need for adaptation. Rather, it questions who defines what adaptation means, whose knowledge counts in designing interventions, and who benefits from adaptation funding. It calls attention to how adaptation discourses and practices can reproduce rather than challenge existing power relations, and how they may foreclose alternative futures that do not align with dominant development paradigms (Ireland and McKinnon 2013).

This critical perspective has begun to influence adaptation practice, with growing attention to questions of justice, transformation, and alternative knowledge systems. Some scholars and practitioners are exploring how adaptation might be reimagined as a site of contestation and possibility rather than technical management—a space where communities can articulate and pursue their own visions of climate-just futures. These approaches emphasize the political nature of adaptation decisions and seek to democratize adaptation governance in ways that center the agency and knowledge of those most affected by climate impacts (Eriksen et al. 2021).

Perhaps most fundamentally, the adaptation regime critique challenges us to rethink what counts as adaptation and who gets to decide. It suggests that true adaptation may require transforming the social, economic, and political systems that produce vulnerability in the first place, rather than simply adjusting to their outcomes. This may involve reimagining and reconfiguring relationships between humans and non-humans, between present and future generations, and between different ways of knowing and being in the world (Escobar 2018).

5 Theory

Climate adaptation discourse serves as a site of contested futures where epistemological and ontological assumptions shape which adaptation pathways are considered possible, legitimate, or desirable, often constraining rather than expanding future possibilities.

Climate adaptation planning represents a critical domain where questions of knowledge, power, and possibility intersect. As societies worldwide develop responses to climate change, they necessarily engage with fundamental questions: What counts as valid knowledge about climate vulnerability? Who has the authority to define appropriate responses? Which futures are considered possible or desirable? This chapter develops a theoretical framework for understanding how adaptation discourse might reflect either epistemological diversity—drawing on multiple knowledge systems and worldviews—or epistemological monoculture—converging around singular ways of knowing and responding.

The framework brings together three interconnected bodies of theory that illuminate different dimensions of this question. First, Boaventura de Sousa Santos’s work on “Epistemologies of the South” provides tools for understanding how certain knowledge systems achieve dominance while others are systematically marginalized or rendered non-existent. This perspective reveals adaptation planning as a potential site of epistemicide—where alternative ways of knowing climate, vulnerability, and response are eliminated through frameworks that cannot recognize them as knowledge.

Second, critical futures studies offers insights into how planning processes shape which futures can be imagined and pursued. The work of scholars like Sohail Inayatullah and Tony Fry shows how anticipatory governance doesn’t simply respond to projected futures but actively constructs them, often eliminating alternative possibilities through the very tools meant to

enhance future-thinking. This temporal dimension is crucial for understanding adaptation as not just technical planning but as future-making that may enable certain worlds while foreclosing others.

Third, the concept of discourse centralization provides a theoretical bridge between these critical perspectives and empirical analysis. By theorizing how patterns of convergence or divergence in discourse might indicate underlying epistemological dynamics, this framework offers a way to make visible processes that typically remain hidden—the systematic operation of power through seemingly neutral technical processes.

Together, these theoretical lenses reveal adaptation planning as more than responses to environmental change. They illuminate it as a domain where colonial relations may extend into new dimensions, where the possibility of alternative futures is at stake, and where the gap between pluriversal possibilities and singular frameworks becomes consequential. The following sections develop each theoretical component, building toward an integrated framework for analyzing how adaptation discourse reflects deeper struggles over knowledge, time, and possibility.

5.1 Epistemologies of the South

Adaptation discourse privileges Northern knowledge systems while systematically marginalizing alternative epistemologies, reproducing cognitive injustice despite the diverse contexts in which adaptation occurs.

A critical starting point for understanding epistemological diversity in climate adaptation is Boaventura de Sousa Santos' concept of "Epistemologies of the South." Santos argues that modern Western knowledge production has systematically rendered alternative knowledge systems invisible through what he terms "epistemicide" – the elimination or marginalization of knowledge systems that do not conform to dominant scientific paradigms (Santos 2016). This cognitive injustice parallels the material injustices of climate change itself, where those least responsible for emissions often face the greatest impacts while having the least voice in shaping response strategies.

Santos identifies two key problems in dominant knowledge systems: the “epistemological problem” concerning what counts as knowledge and who can produce it, and the “ontological problem” concerning what exists and how we relate to it. Both problems are evident in climate adaptation discourse, where certain forms of expert knowledge (particularly climate science, economics, and engineering) are typically privileged over indigenous, local, and experiential knowledge. This privileging occurs despite growing recognition that addressing complex challenges like climate adaptation requires diverse knowledge systems working in complementarity rather than hierarchy.

The mechanisms through which epistemicide operates extend far beyond direct suppression. Santos identifies five monocultures that structure modern thinking and systematically produce non-existence (Santos 2016). The monoculture of knowledge establishes scientific knowledge as the sole criterion of truth, rendering other forms of knowing as ignorance or folklore. The monoculture of linear time positions certain societies as “advanced” and others as “backward,” creating a temporal hierarchy that justifies intervention. The monoculture of social classification naturalizes hierarchies based on race, gender, and class. The monoculture of the dominant scale privileges the global and universal over the local and particular. Finally, the monoculture of capitalist productivity recognizes only what contributes to economic growth as productive, dismissing subsistence practices and reciprocal economies as unproductive. These monocultures manifest across various domains of global governance, revealing systematic patterns of epistemological violence. Structural adjustment programs of the 1980s and 1990s exemplified this process, rendering invisible local economic practices that maintained community resilience through reciprocity, collective labor, and non-monetary exchange. These practices were not merely overlooked but actively reconstructed as obstacles to development, their elimination framed as necessary modernization.

Contemporary biodiversity conservation frameworks similarly exclude indigenous management systems by demanding documentation and quantification in forms these systems never required. Traditional ecological knowledge accumulated over generations through oral tradition and embodied practice cannot be captured in species inventories or ecosystem service valuations, and thus disappears from conservation planning. Poverty

reduction strategies provide another revealing example, eliminating alternative conceptions of wellbeing by imposing metrics that recognize only monetary income and formal employment. Communities that maintain rich social relationships, cultural practices, and subsistence security despite low cash incomes are rendered “extremely poor” and targeted for interventions that may actually undermine their wellbeing. In each case, the epistemicide operates not through direct suppression but through frameworks that simply cannot recognize other ways of knowing as knowledge at all.

This systematic exclusion becomes particularly acute in contexts of anticipatory governance, where institutions attempt to manage emerging futures. As Guston notes, anticipatory governance aims to build “a broad-based capacity extended through society that can act on a variety of inputs to manage emerging knowledge-based technologies while such management is still possible” (Guston 2014). Yet whose knowledge constitutes legitimate “inputs” for this future-making process? The emphasis on “knowledge-based technologies” already signals a privileging of technoscientific approaches over other ways of understanding and relating to uncertain futures.

The concept of cognitive justice suggests that there can be no social justice without recognizing the validity and value of diverse ways of knowing. In the context of climate adaptation, cognitive justice would require creating space for multiple knowledge systems to inform how vulnerability is understood and addressed. This does not mean uncritically accepting all knowledge claims as equally valid but rather recognizing that different knowledge systems have different strengths, limitations, and domains of applicability. Scientific knowledge excels at identifying large-scale patterns and projecting future scenarios, but may miss the nuanced understanding of local variability that comes from generations of place-based observation. Indigenous knowledge systems often embed sophisticated understanding of ecological relationships within cultural practices and spiritual frameworks that Western science dismisses as merely cultural.

Santos proposes an “ecology of knowledges” as an alternative to epistemological monocultures. Rather than positioning Western scientific knowledge as inherently superior to other forms of knowledge, an ecology of knowledges recognizes the partial and situated nature of all knowledge systems and seeks productive

dialogue between them. This approach aligns with calls from scholars and practitioners for more pluralistic and inclusive approaches to climate adaptation that draw on diverse knowledge systems. However, the challenge lies not merely in including different knowledge but in creating conditions where these different ways of knowing can genuinely shape understanding and action.

The distinction between technocratic and relational ontologies illuminates why certain knowledge systems dominate while others are marginalized. A technocratic ontology frames vulnerability as primarily a technical problem requiring expert solutions, emphasizing quantification, prediction, and control. This perspective positions adaptation as a process of adjusting systems to accommodate projected climate impacts, with technologies and management techniques as primary solutions. Within this framework, valid knowledge is that which can be standardized, measured, and scaled – vulnerability indices, climate projections, cost-benefit ratios.

In contrast, a relational ontology understands vulnerability as embedded in dynamic social-ecological relationships and power dynamics. This perspective emphasizes connectivity, emergence, and transformation, viewing adaptation as a process of reconfiguring relationships between humans and non-humans, present and future generations, and different forms of knowledge. From this standpoint, knowledge is always situated, embodied, and relational – inseparable from the contexts and relationships through which it emerges. The dominance of technocratic ontologies in adaptation discourse reflects broader patterns of knowledge production that privilege certain ways of knowing and being while marginalizing others. This dominance is not politically neutral but shapes which adaptation pathways are considered legitimate or feasible, often reinforcing existing power relations rather than transforming them (Scoville-Simonds, Jamali, and Hufty 2020). The concept of “provincializing Europe” helps understand what moving beyond epistemological monocultures might entail (Chakrabarty 2009). Rather than accepting European-derived categories as universal, this approach reveals them as particular, historical products that achieved global dominance through colonial violence. The scientific method, the nation-state, development, and now adaptation – all emerge from specific European historical experiences yet are treated as

universal frameworks all societies must adopt. Provincializing these concepts does not mean rejecting them entirely but recognizing their particularity and the violence involved in their universalization.

The role of expertise and professional networks in maintaining epistemological monocultures deserves particular attention. As Brinks and Ibert note, expertise is not simply technical knowledge but a social relation involving recognition, authority, and trust (Brinks and Donner 2025). Networks of experts – trained in similar institutions, using similar frameworks, reading similar literatures – create what might be termed epistemological corridors through which certain forms of knowledge flow while others are blocked. These networks operate across scales, from global climate science communities to regional development banks to national planning agencies, creating remarkable consistency in how problems are framed and solutions imagined.

Understanding how epistemicide operates through adaptation planning requires methods that can make visible what is usually invisible – the systematic production of epistemological monoculture. If Santos is correct that certain knowledge systems are actively produced as non-existent, then we should be able to observe this empirically in how adaptation is discussed across different contexts. High convergence in adaptation discourse would indicate successful epistemicide, showing that despite diverse contexts, challenges, and knowledge traditions, only certain ways of knowing can find expression in formal planning processes. This sets the stage for examining how the measurement of discourse patterns can reveal the operation of epistemological power in contemporary climate governance.

5.2 Future-making

Adaptation planning engages in anticipatory governance that actively shapes which futures are considered possible or impossible, with dominant approaches often constraining rather than expanding adaptation possibilities.

Climate adaptation is fundamentally oriented toward the future, concerned with anticipating and responding to projected climate impacts. How futures are imagined and constructed

through adaptation discourse shapes what interventions are considered necessary, desirable, or even possible. Different approaches to future-making in adaptation reflect different epistemological and ontological assumptions, with significant implications for whose futures are prioritized and how agency is distributed (Nalau and Cobb 2022). Sohail Inayatullah’s typology of predictive, cultural, and critical epistemologies of the future provides a useful framework for understanding different approaches to future-making in adaptation (Inayatullah 1990). The predictive approach, dominant in mainstream adaptation discourse, relies on scientific forecasting, scenario planning, and risk assessment to anticipate future climate impacts and design appropriate responses. This approach privileges certain forms of expertise, particularly climate science, economics, and engineering, and tends to frame the future primarily in terms of biophysical changes and their direct consequences.

While valuable for identifying potential risks and intervention points, the predictive approach often inadequately addresses the social, cultural, and political dimensions of climate futures. It may present particular development pathways as inevitable rather than as choices shaped by values and power relations. Moreover, by positioning experts as the primary authorities on the future, predictive approaches may marginalize the future visions and aspirations of communities most affected by climate impacts (Goode and Godhe 2017).

The cultural approach to futures emphasizes how different cultural contexts produce different understandings of time, change, and desirable futures. This approach recognizes that how communities imagine and relate to the future is shaped by cultural values, traditions, and worldviews that may differ significantly from dominant Western frameworks (Inayatullah 1990). Indigenous cosmologies, for instance, often emphasize cyclical rather than linear time, relationships with ancestors and future generations, and responsibilities to non-human beings – all of which generate different orientations toward the future than those embedded in Western planning frameworks.

The critical approach to futures focuses on examining and challenging the assumptions, power relations, and interests embedded in dominant future visions. This approach seeks to “denaturalize” seemingly inevitable futures by revealing how they are constructed through particular discourses and practices (Inayatullah 1990). In adaptation, a critical approach might in-

terrogate whose interests are served by particular adaptation pathways, how vulnerability is constructed through adaptation discourse, and what alternative futures are rendered invisible or implausible by dominant approaches.

The dominance of predictive epistemologies in global governance connects to what Goode and Godhe identify as “capitalist realism” – the sense that capitalist social relations are natural and inevitable, constraining imagination of alternative futures (Goode and Godhe 2017). When adaptation is framed primarily within existing capitalist relations and market logics, alternatives that might challenge these relations become difficult to imagine or articulate. This narrowing of future possibilities reflects broader patterns of what might be termed anticipatory enclosure, where the future is colonized by present power relations before it arrives.

The concept of anticipatory governance illuminates both the promise and peril of future-oriented planning. Guston defines anticipatory governance as building capacities for “foresight, engagement, and integration” to manage emerging challenges (Guston 2014). In principle, this forward-looking orientation could create space for diverse communities to shape their own futures. In practice, however, anticipatory governance often operates through specific institutional arrangements, expert networks, and knowledge frameworks that privilege certain futures while foreclosing others.

This brings us to the crucial concept of “defuturing” developed by Tony Fry. Defuturing refers to the systematic destruction of futures – not through catastrophic events but through the mundane operation of design decisions, planning processes, and institutional arrangements that eliminate possibilities before they can emerge (Fry 2019). Fry argues that modern design and planning are fundamentally defuturing, creating unsustainable systems that consume the future to maintain the present. In the context of global governance, defuturing operates through frameworks that can only recognize certain kinds of futures as valid or feasible.

The tools and methods of future-making play a crucial role in this defuturing process. Scenario planning exercises, for instance, typically begin from current trajectories and project forward, making it difficult to imagine radical discontinuities or alternative development paths. Vulnerability assessments

focus on exposure to physical hazards within existing social arrangements rather than questioning those arrangements. Cost-benefit analyses discount future impacts in ways that systematically undervalue long-term transformation in favor of short-term adjustment. Each of these tools shapes not just how the future is known but what futures can be imagined (Fry 2019).

Ivan Illich’s analysis of tools provides another lens for understanding how future-making operates in governance contexts. Illich distinguishes between tools that enhance capability and those that create dependency, arguing that many modern tools – despite appearing to expand human capacities – actually constrain autonomy and imagination (Illich 2009). In adaptation planning, the proliferation of assessment tools, modeling frameworks, and planning templates might be understood as creating what Illich terms “radical monopoly” – not just monopoly over products but over processes of imagination and response.

The consultants who carry these tools between contexts become what Illich might recognize as “disabling professionals” – experts whose specialized knowledge creates dependencies rather than building local capacities (Illich 2009). A consultant arrives with frameworks developed in one context and applies them in another, shaping how local actors must articulate their understanding of vulnerability and their visions for adaptation. Communities learn to see their own futures through these imported lenses, potentially losing connection with their own ways of anticipating and preparing for change.

This process connects to what Walter D. Mignolo identifies as the coloniality of knowledge and being – the ways colonial power relations extend into the present through knowledge systems and subjectivities (Mignolo 2011). But Mignolo’s analysis points toward something even more profound: the colonization of time itself. The “colonial matrix of power” doesn’t just operate in space but extends into the temporal dimension, shaping which pasts can be remembered and which futures can be imagined. This temporal colonialism manifests in multiple ways through planning processes. Linear progress narratives position certain societies as “advanced” and others as needing to “catch up,” reproducing colonial hierarchies through temporal framing. Predictive models typically assume that current development trajectories will continue, making it difficult to imagine alternative pathways that might emerge from different values or social arrangements. Financial mechanisms like loans and climate funds

create temporal dependencies, locking countries into particular development paths to service debts or meet donor requirements. Planning horizons privilege certain temporal scales – often the medium-term relevant to political and funding cycles – while marginalizing both immediate needs and long-term transformations (Mignolo 2011).

Kyle Whyte’s concept of “relational tipping points” adds another crucial dimension to understanding temporal colonialism in environmental governance. While much attention focuses on ecological tipping points – thresholds beyond which environmental systems shift to new states – Whyte argues that relational tipping points may be crossed first (Whyte 2020). These are points beyond which the relationships necessary for collective action are too damaged to enable coordinated response. For indigenous peoples facing climate change, centuries of colonial violence have already damaged the trust, reciprocity, and mutual recognition needed for collaborative adaptation. The time required to rebuild these relationships may exceed the time available before ecological crises (Whyte 2020).

This analysis connects directly to the concept of “anticipatory ruination” developed in studies of climate adaptation. Paprocki shows how certain places are rendered as already lost to climate change, justifying radical interventions in the present (Paprocki 2019). This is not simply prediction but performative – by imagining certain futures as inevitable, planning processes help bring them into being. When coastal communities are designated as future flood zones, investment shifts away, infrastructure deteriorates, and outmigration accelerates, creating the abandonment that was supposedly being prevented. The implications of understanding future-making as a site of power and potential violence are profound. If planning processes actively defuture – eliminating possible worlds before they can emerge – then the stakes of adaptation governance exceed technical questions of risk management. The issue becomes not just which adaptations are chosen but which futures are allowed to exist. This is particularly critical for communities whose ways of life, knowledge systems, and relationships with land and water are rendered impossible by planning processes that can only recognize certain kinds of futures.

Critical futures studies offers resources for challenging these patterns of defuturing. As Goode and Godhe argue, the task

is not simply to predict probable futures or envision preferable ones, but to critically examine how futures are produced, whose interests they serve, and what possibilities they foreclose (Goode and Godhe 2017). This critical orientation opens space for what might be termed “re-futuring” – actively creating conditions for multiple futures to flourish rather than converging on a single trajectory determined by current power relations.

The concept of “pluriversal futures” emerging from Latin American scholarship offers one vision of what re-futuring might entail. Rather than a single future toward which all societies converge, this approach imagines multiple temporal trajectories emerging from different ontologies and ways of life (Escobar 2020). These are not simply different paths to the same destination but genuinely different worlds with their own temporal rhythms, relationships, and possibilities. Supporting such pluriversal futures requires more than inclusive planning – it requires recognizing that different peoples may inhabit fundamentally different temporal worlds.

Understanding future-making as a contested terrain of power reveals adaptation planning as more than technical response to environmental change. It emerges as a site where colonial relations extend into the temporal dimension, where certain futures are enabled while others are foreclosed, where the very possibility of alternative worlds is at stake. This brings us to the question of how we might empirically observe these processes of defuturing – how discourse patterns might reveal the systematic elimination of alternative futures. The concept of discourse centralization offers one approach to making visible what is often hidden: the successful reduction of pluriversal possibilities to singular trajectories.

5.3 Discourse Centralization

The concept of discourse centralization provides a theoretical framework for analyzing how adaptation discourse reflects either epistemological diversity or monoculture across different contexts and dimensions.

The theoretical tensions between epistemological diversity and monoculture, while conceptually rich, require empirical ground-

ing to move beyond assertion and critique. Discourse centralization represents the degree to which adaptation planning documents concentrate their attention on a limited set of themes versus distributing attention across many diverse topics. In a highly centralized discourse, most documents emphasize the same few topics, suggesting a convergence around particular ways of understanding and addressing adaptation. Conversely, a decentralized discourse would show documents emphasizing different combinations of topics, indicating greater diversity in how adaptation challenges and responses are conceptualized. This pattern of concentration or dispersion serves as a proxy for epistemological diversity—the range of knowledge systems, values, and worldviews that inform adaptation planning.

The significance of measuring discourse centralization lies in what it reveals about the constraints and possibilities within adaptation planning. When discourse is highly centralized, it suggests that despite the diverse contexts in which adaptation occurs—from small island states facing sea-level rise to landlocked countries confronting desertification—there is a remarkable uniformity in how these challenges are understood and articulated. This uniformity might reflect the influence of international frameworks, funding requirements, or technical assistance that promote particular approaches. Alternatively, decentralized discourse would indicate space for diverse conceptualizations that might draw on local knowledge, alternative development paradigms, or context-specific understandings of vulnerability and resilience.

Drawing on Santos’s concept of abyssal thinking, discourse centralization can be understood as an empirical manifestation of how certain knowledge comes to exist “on this side of the line” while other knowledge is actively produced as non-existent (Santos 2016). The line Santos describes is not merely a boundary but an active process of differentiation that grants reality to some forms of knowledge while denying it to others. High discourse centralization would indicate that this abyssal line operates effectively—that despite the diversity of contexts, challenges, and knowledge traditions present in different countries, only knowledge from “this side” can find expression in formal planning documents. This connects to Santos’s analysis of how the five monocultures produce non-existence. When adaptation documents across diverse contexts converge on similar topics—financial mechanisms, institutional arrangements, tech-

nical assessments—we observe the monoculture of knowledge in operation, where only certain forms of expertise are recognized as valid. When these documents frame adaptation primarily in terms of future projections and linear progress, we see the monoculture of linear time eliminating other temporal orientations. The measurement of centralization thus becomes a way to observe empirically what Santos argues occurs epistemologically—the active production of non-existence through frameworks that cannot recognize alternative ways of knowing (Santos 2016).

The relationship between discourse patterns and epistemological diversity is not one of simple correspondence but of indication and revelation. High centralization does not cause epistemicide but indicates its successful operation. When countries facing fundamentally different environmental challenges produce remarkably similar planning documents, this suggests that the frameworks through which they must articulate their understanding are powerfully constraining. The convergence reveals not what these countries think about adaptation but what they must say to participate in international climate governance.

This distinction is crucial for understanding discourse centralization as more than a linguistic phenomenon. The patterns we observe in texts are materializations of deeper epistemological and political processes. When a Pacific island nation and a landlocked African country produce similar adaptation plans focused on institutional capacity and financial mechanisms, this similarity does not reflect shared understanding but shared subjection to frameworks that can only recognize certain kinds of knowledge and certain ways of articulating need.

Arturo Escobar’s concept of the pluriverse provides another theoretical lens for understanding what discourse centralization reveals (Escobar 2018). Escobar contrasts the “one-world world” (OWW) of modernity—which assumes a single reality that can be known through universal science—with the pluriverse, “a world where many worlds fit.” The pluriverse is not simply cultural diversity within a single world but recognition of multiple ontologies, multiple ways of being and knowing that create genuinely different worlds.

From this perspective, high discourse centralization indicates the successful imposition of the one-world world over pluriversal possibilities. When adaptation planning can only recognize

certain forms of vulnerability (those measurable through indices), certain temporalities (linear projections), and certain responses (technical interventions), it actively eliminates other worlds where vulnerability might be understood relationally, time might be cyclical, and responses might involve ceremony, reciprocity, or transformation of social relations. The degree of centralization thus becomes a measure of how successfully the one-world world has eliminated pluriversal possibilities (Escobar 2018).

This framework helps distinguish between superficial diversity and genuine epistemological plurality. Documents might vary in their specific content—mentioning different crops, infrastructures, or hazards—while converging at a deeper epistemological level in how they understand the nature of climate challenge and appropriate response. Conversely, even similar-sounding content might emerge from fundamentally different epistemological groundings. The measurement of discourse centralization attempts to capture these deeper patterns rather than surface variations.

The theoretical significance of this approach extends beyond description to revelation. By making discourse patterns visible and measurable, we can observe processes that typically remain hidden. Epistemicide does not announce itself—it operates through the quiet violence of bureaucratic forms, funding criteria, and technical requirements that seem neutral while systematically excluding alternative ways of knowing. The measurement of centralization makes this violence visible by showing its effects: the remarkable convergence of discourse despite diverse contexts.

This connects to Fry’s concept of defuturing, but at an epistemological level (Fry 2019). Just as defuturing eliminates possible worlds before they can emerge, epistemological centralization eliminates possible ways of knowing and articulating before they can find expression. The measurement of discourse patterns reveals not just what is said but what has become unsayable—the alternatives that have been successfully eliminated from the realm of formal articulation.

The approach differs fundamentally from simply noting similarities across documents or conducting comparative analysis. Rather than asking “how are these documents similar or different,” the centralization framework asks “what does the pattern

of similarity and difference reveal about the operation of epistemological power?” The interest is not in cataloging convergences but in understanding what these convergences indicate about which knowledge systems can find expression and which are systematically excluded.

This theoretical framing establishes why computational approaches like topic modeling offer valuable tools for critical analysis. These methods can process large corpora of documents to identify patterns that might not be visible through close reading of individual texts. More importantly, they can quantify the degree of convergence in ways that make abstract concepts like epistemicide empirically tractable. The patterns revealed through such analysis do not speak for themselves but require theoretical interpretation informed by critical perspectives on knowledge, power, and possibility.

The measurement of discourse centralization also connects to broader methodological discussions in decolonial research. As Linda Tuhiwai Smith argues, research methodologies themselves can be tools of colonization, imposing external frameworks and extracting knowledge in ways that reinforce colonial relations (Smith 2022). The approach to measuring centralization must therefore be reflexive about its own epistemological assumptions and political implications. The goal is not to impose another universal framework but to develop tools that can reveal the operation of universalizing frameworks.

This brings us to a crucial distinction between centralization as homogenization and centralization as domination. Simple homogeneity might result from shared challenges or convergent evolution of responses. But when homogeneity occurs despite radically different contexts and in ways that systematically exclude certain forms of knowledge, it indicates domination—the successful imposition of particular epistemological frameworks over others. The theoretical framework of discourse centralization aims to distinguish between these possibilities.

The implications of high centralization extend beyond academic analysis to questions of justice and possibility. If adaptation planning operates to systematically exclude alternative ways of knowing and being, then it functions not as a response to climate change but as a mechanism for maintaining colonial

relations through new vocabularies. The measurement of centralization provides one way to make this operation visible and thus contestable.

Understanding discourse centralization as an indicator of epistemological monoculture also suggests possibilities for resistance and transformation. If we can identify where and how alternative epistemologies are excluded, we might also identify spaces where they persist or could flourish. Lower centralization might indicate cracks in the system—places where the one-world world has not fully succeeded in eliminating alternatives. These spaces, however marginal, might offer starting points for nurturing epistemological diversity.

The theoretical framework of discourse centralization thus serves multiple purposes. It provides a bridge between abstract concepts like epistemicide and empirical analysis. It offers a way to observe processes that typically remain hidden. It reveals the operation of power through knowledge frameworks that appear neutral. Most fundamentally, it makes visible the gap between the pluriversal possibilities that exist in the world and the singular framework that dominates formal planning processes. This visibility is a necessary first step toward creating conditions where many worlds might flourish rather than being reduced to one.

This theoretical grounding establishes the foundation for empirical investigation. If discourse centralization indicates epistemological monoculture, then measuring centralization across different contexts can reveal how successfully dominant frameworks have eliminated alternatives. The patterns observed—whether high or low centralization, whether varying by region, income, or geography—become legible as indicators of epistemological power in operation. This sets the stage for developing methodological approaches that can capture these patterns while remaining attentive to what they reveal about knowledge, power, and the possibility of alternative futures in climate governance.

6 Methods

To empirically examine whether adaptation discourse reflects epistemological diversity or monoculture, I develop a methodological approach centered around the “Dominance Index”—a measurement tool for quantifying the degree to which adaptation discourse is concentrated around particular topics or perspectives.

The theoretical tensions between epistemological diversity and monoculture in climate adaptation, while conceptually rich, require empirical grounding to move beyond assertion and critique. This chapter presents a methodological approach that translates these theoretical concerns into measurable patterns, examining National Adaptation Plans as windows into how different countries conceptualize climate adaptation within the constraints and possibilities of international climate governance.

National Adaptation Plans offer a unique opportunity for this analysis because they represent how countries formally articulate their understanding of climate vulnerability and appropriate responses within a standardized international framework. While these documents are shaped by UNFCCC guidelines, technical assistance, and funding requirements, they also reflect national contexts, priorities, and potentially diverse knowledge systems. By analyzing patterns across a comprehensive corpus of NAPs, we can identify whether this institutional framework produces convergence toward particular ways of understanding adaptation or preserves space for alternative conceptualizations that might draw on different epistemological foundations.

The analytical pipeline developed for this research proceeds through three integrated stages, each designed to build toward a systematic assessment of discourse patterns. First, the document preparation creates comparability across diverse national contexts through careful preprocessing that removes superficial

differences while preserving meaningful variation in how adaptation is conceptualized. Second, the structural topic modeling identifies the latent thematic patterns that structure adaptation discourse, revealing what aspects of adaptation receive attention and how different topics cluster together. Third, the analysis stage introduces the Dominance Index to measure how concentrated discourse is around a small number of dominant topics, providing a quantifiable metric for discourse centralization that can be compared across different country groupings.

The patterns we seek through this analysis directly address the research questions about power, knowledge, and development paradigms in climate adaptation. If adaptation discourse shows high centralization—with most countries emphasizing the same narrow set of topics—this would support arguments that adaptation functions as an epistemological monoculture that forecloses alternative understandings. The specific topics that dominate would reveal what kinds of knowledge and approaches are privileged within this regime. Conversely, lower centralization would indicate space for diverse conceptualizations, though the degree and nature of this diversity would require careful interpretation. Most critically, examining how centralization patterns vary across income levels, regions, and geographic vulnerabilities can reveal whether discourse is shaped more by economic positioning within global systems or by the specific nature of climate challenges faced.

The entire analysis was conducted in R (R Core Team 2025), with reproducible research principles supported by `renv` (Ushey and Wickham 2025) for package management and Quarto for dynamic document generation. Data manipulation and transformation relied on the tidyverse ecosystem (Wickham et al. 2019), while the analytical pipeline employed custom functions designed for transparency and reproducibility. All code and data processing steps are documented and available for replication.

This chapter presents each methodological stage with sufficient detail to ensure transparency and reproducibility while remaining accessible to readers without extensive technical background in computational text analysis. The following sections on document preparation, structural topic modeling, and analysis each begin with a brief overview of purpose and approach before explaining the specific procedures and their justification. Throughout, the emphasis remains on how these

methodological choices serve the broader research objective of empirically examining the epistemological politics of climate adaptation.

6.1 Corpus Collection and Preparation

To level the playing field and make the NAPs comparable across documents, I have developed a systematic approach to extract, clean, and prepare the text, as well as finding and adding the necessary metadata for analysis.

The analysis begins with the systematic collection of National Adaptation Plans from the UNFCCC's NAP Central website. To do this, I set up a web scraper using the `polite` package (Perepolkin 2023) that automatically scans the website and extracts the country name, the date posted and the link to the download for English language NAPs. This process found 47 English plans, of 63 countries in total.

While focusing on English-language documents introduces a potential bias toward Anglophone countries or those with stronger ties to international institutions, this constraint was necessary to ensure meaningful textual comparison using consistent analytical methods. It is also valuable, as the working language of the World Bank and other international institutions is English (De Francesco and Guaschino 2020).

The data then took different paths. The documents downloaded automatically, before the text was extracted using `pdftools` (Ooms 2025) and read into R (R Core Team 2025). The text was then cleaned to make the comparable across the whole corpus using `quanteda` (Benoit et al. 2018). I used the default pipeline for text processing with the `stm` package (M. E. Roberts, Stewart, and Tingley 2019a). This included removing common words with little semantic value known as stopwords using `stopwords` (Benoit, Muhr, and Watanabe 2021), numbers, punctuation, and reducing all words to their stem using `SnowballC` (Bouchet-Valat 2023) removing their ending so the same word with different endings is counted as one.

The NAPs presented two issues, first, as the documents are published as Portable Document Files (PDFs), a format while preserving formatting and making it possible to print, also introduces a lot of different artifacts when extracting the text. Second, the texts included national specific content like country-names and often a summary in the national language. Both cluttered the corpus and made the topics very low quality.

To combat this, I filtered the corpus quite aggressively, removing words that occurred in Here I removed common stop words (words with little semantic meaning) and removed words that only occurred in less than 10% of documents, and words that occurred in more than 80% documents (M. E. Roberts, Stewart, and Tingley 2019b).

The other issue was solved by making a list of stopwords based on country names in the `countrycode` packages (Arel-Bundock, Enevoldsen, and Yetman 2018). The whole process left us with 462 222 of the 1 962 976 words we started with, and 1971 of 112 050 unique terms.

The metadata was extracted and processed independently from the documents. The country name was extracted and standardized with the help of the `countrycode` package (Arel-Bundock, Enevoldsen, and Yetman 2018). These standardized names were then compared with the `wbstats` package (Piburn 2020), and added in the World Banks data on income, classifying the countries as low income, lower middle income, upper middle income and high income countries.

The same process was used to assign the countries to their World Bank region. These seven regions are East Asia and Pacific, Europe and Central Asia, Latin America and Caribbean, Middle East and North Africa, North America, South Asia, and Sub-Saharan Africa. Assigning these categories serves two functions, first it makes the country groups large enough for robust calculations, and we are using the largest development actors own definitions.

In addition to these categories, I scraped the website for the Office of the High Commissioner for Least Developed Countries, Landlocked Developing Countries and Small Islands Developing States using `polite` (Perepolkin 2023) and `rvest` for web scraping. Here, I extracted a list of all countries classified as

landlocked (LLDC) or as small islands (SIDS). These are proxies for countries facing the same geographic issues, across regions and income levels. This identified 12 SIDS and 12.

The last category I extract is the date the plans were posted. The plans have been drafted since 2015, and the latest in 2025. To make it possible to see if the timing of the plans influence them, I split them into three groups, early (-2018), middle (until 2022) and late (2023-). Together, these categories allow us to examine whether discourse patterns align more strongly with economic positioning, regional institutions, or shared geographic vulnerabilities.

6.2 Structural Topic Modeling

Structural topic modeling allows us to discover latent themes in the corpus, reducing the corpus to word clusters we can analyze later.

Topic modelling is an approach that discovers latent thematic patterns in large text corpora. For our purposes, this makes it possible to interact with the whole corpus that spans 1 962 976 words, in an analytical way.

Unlike simple word frequency analysis or manual coding, topic models identify clusters of words that tend to co-occur across documents, revealing underlying themes that structure the discourse. The fundamental assumption is that each document contains a mixture of topics, where topics are probability distributions over words (M. E. Roberts, Stewart, and Airoldi 2016). For instance, a topic related to agricultural adaptation might have high probabilities for words like “crop,” “drought,” “irrigation,” and “yield,” while a topic about coastal adaptation might emphasize “sea-level,” “erosion,” “storm,” and “infrastructure.” The model treats documents as “bags of words,” meaning word order is not considered. This simplification allows for computationally efficient discovery of thematic patterns across our documents.

One important note to this approach is the document-centric nature of it. It treats the document as the organizing principle, making corpuses with a few long documents like the NAPs centralized into a pattern of one topic per document. To avoid this, I split the NAPs into different segments, making the model

run them as if they are separate documents, before I aggregate them again. This leads to considerably less concentration in each topic, making the dominance values much clearer, but also introduces the risk of losing some content, since the documents are split after a certain amount of tokens.

Structural topic modeling (STM) (M. E. Roberts, Stewart, and Tingley 2019a) expands on this topic modeling while simultaneously accounting for document-level metadata (M. E. Roberts, Stewart, and Tingley 2019b). It is well-suited to our research because it allows our document metadata, the income level, region, and geographic characteristics, to influence the distribution of topics. To do this in practice, we pass the categories we created to the model. This is crucial for understanding whether low-income countries emphasize different aspects of adaptation compared to high-income countries, or whether SIDS frame adaptation differently than landlocked nations.

The appropriate number of topics represents a methodological decision that balances granularity with interpretability. Too few topics may obscure important distinctions in how adaptation is conceptualized, while too many topics can result in redundant or overly specific themes that fragment coherent concepts. I used the `stm` package (M. E. Roberts, Stewart, and Tingley 2019a) to run a smaller model on a wide range of values, and then evaluating them based on their semantic coherence, how interpretable the topics are, and the exclusivity, how distinct the topics are.

Semantic coherence measures the likelihood for the topic's top words to occur in the same document. It takes the highest-probability words assigned to a topic and calculates how often they actually appear together in individual NAP documents. High semantic coherence means that when you see one of the topic's key words in a document, you're likely to see the other key words too. Low semantic coherence means the model has grouped together words that rarely appear in the same documents - suggesting the topic might be a statistical artifact rather than a genuine thematic cluster.

Exclusivity measures how distinctive the highest-probability words are to each topic. Technically, it calculates the proportion of each word's total probability mass that is allocated to the specific topic, weighted by that word's rank within the topic. A word that appears prominently in only one topic gets high

exclusivity, while a word that appears prominently across many topics gets low exclusivity.

I weigh the coherence and exclusivity 50% against 50%, giving us a 8 as the optimal number of topics. The model was then run using spectral decomposition, which provides more stable and reproducible results compared to random (M. E. Roberts, Stewart, and Tingley 2019b). After 49 iterations, the model converged successfully, indicating that the algorithm had identified stable topic distributions.

6.3 Dominance analysis

To analyse the distribution of topics I use three different methods, first I name the topics, and analyse their prominence in the discourse, then I measure the concentration within the three top topics in the category, before I calculate how much explanatory power each category has for the topic prominence.

For each category (income level, region, geographic vulnerability), I calculate dominance as follows. First, I identify all countries belonging to a specific group (for example, all low-income countries or all SIDS) and extract their topic proportion vectors from the fitted STM model. These proportions represent how much each of the 8 topics contributes to each country's adaptation discourse. I then calculate the mean topic proportions across all countries in the group, creating an average discourse profile for that category.

Next, I identify the top 3 most prominent topics for the group by ranking topics according to their average proportions. The Dominance Index is calculated as the sum of proportions for these top 3 topics. This approach captures the degree to which a group's adaptation discourse concentrates around a small number of dominant themes rather than being distributed evenly across all possible topics.

A high dominance score (approaching 1.0) indicates that most of the group's adaptation discourse focuses on just 3 topics, suggesting a concentrated or potentially constrained understanding of adaptation challenges and responses. A lower dominance score indicates more distributed attention across the full

range of adaptation topics, potentially reflecting greater diversity in how adaptation is conceptualized. Importantly, the dominance measure is scale-independent, making it comparable across groups of different sizes and allowing systematic comparison between, for example, small island developing states and large regional groupings.

To generate human-readable topic names, I employed the `topiclabels` package (Rieger et al. 2024), which uses large language models to create interpretable labels based on the most frequent and exclusive words (FREX terms) generated by the STM model (M. E. Roberts, Stewart, and Tingley 2019a). This approach ensures consistent and meaningful topic identification while maintaining the reproducibility of the analytical pipeline.

While the Dominance Index reveals patterns of discourse concentration, establishing whether these patterns are statistically meaningful requires formal hypothesis testing. I employ structural topic modeling’s `estimateEffect` function (M. E. Roberts, Stewart, and Tingley 2019a) to test whether categorical group membership significantly influences topic distributions (M. E. Roberts, Stewart, and Tingley 2019b).

For each group showing high dominance, I test the null hypothesis that group membership has no effect on the prominence of the dominant topics. The alternative hypothesis is that group membership significantly influences these topic distributions, suggesting that shared characteristics (income level, regional context, or geographic vulnerability) systematically shape how countries frame adaptation challenges.

The statistical test works by fitting regression models for each dominant topic, with group membership as the predictor variable and topic proportions as the outcome. I use binary indicators for each group (for example, SIDS vs. non-SIDS, or low-income vs. other income levels) to test specific hypotheses about discourse patterns. The STM framework (M. E. Roberts, Stewart, and Tingley 2019a) accounts for the compositional nature of topic proportions and provides appropriate standard errors for hypothesis testing.

All analysis was conducted in R (R Core Team 2025) using the integrated development environment provided by RStudio. Statistical calculations use base R functions supplemented by specialized packages where appropriate.

I report p-values from two-tailed significance tests, with results considered statistically significant at $\alpha = 0.05$. This conservative approach ensures that claims about systematic discourse patterns are supported by robust statistical evidence rather than random patterns in a small corpus.

7 Findings

The analysis of National Adaptation Plans through structural topic modeling and discourse centralization metrics reveals patterns that speak directly to questions of epistemological diversity, institutional influence, and the relationship between climate vulnerability and adaptation planning.

This chapter presents the empirical results of applying computational text analysis to 45 National Adaptation Plans submitted to the UNFCCC between 2015 and 2025. The analysis proceeds through three integrated stages, each building upon the previous to develop a comprehensive picture of how climate adaptation is conceptualized across different national contexts.

The structural topic modeling stage employs machine learning algorithms to identify latent thematic patterns that organize adaptation discourse, revealing which aspects of climate response receive sustained attention and which remain marginal across the corpus. This unsupervised approach allows themes to emerge from the data itself rather than being imposed through predetermined categories, enabling discovery of patterns that might not be apparent through traditional qualitative analysis.

The discourse centralization analysis quantifies the degree to which adaptation planning concentrates on narrow thematic foci versus embracing diverse approaches. Using the Dominance Index—a novel application of concentration metrics to policy discourse—this stage examines how focused or dispersed adaptation conceptualization is both within individual documents and across systematic country groupings.

The variance decomposition stage employs statistical techniques borrowed from experimental design to partition observed differences in discourse patterns according to theoretically relevant factors: regional institutional contexts,

economic positioning in the global system, geographic vulnerability characteristics, and temporal evolution of the adaptation planning process. This approach reveals the relative explanatory power of different structural factors in shaping how countries articulate their adaptation approaches.

The first section presents the topics identified through structural topic modeling, examining their content, prevalence, and distribution across the corpus. These topics range from sectoral concerns like water resources and agriculture to procedural themes involving finance and governance. Understanding what these topics contain and how prevalent they are provides the foundation for interpreting subsequent patterns of concentration and variation. The analysis reveals not only what countries discuss when planning adaptation but also what remains absent or marginal in these discussions.

The second section examines patterns of discourse centralization through the Dominance Index calculated at the corpus level. This analysis reveals whether countries within particular groupings converge on similar themes or maintain diverse approaches. The analysis systematically examines these patterns across four dimensions: income levels ranging from low to high, regional groupings spanning six geographic areas, special geographic designations for Small Island Developing States and Landlocked Developing Countries, and temporal periods reflecting the evolution of adaptation planning from 2015 to 2025. These comparisons reveal where discourse shows greater uniformity versus diversity.

The third section investigates which factors best explain the variation observed in discourse patterns through variance decomposition analysis. By partitioning the differences in dominance values according to regional, economic, geographic, and temporal categories, this analysis reveals the relative importance of different factors in shaping adaptation discourse. The results indicate whether countries with similar economic positions, regional affiliations, geographic vulnerabilities, or submission periods tend to conceptualize adaptation in similar ways, providing insight into what drives convergence or divergence in adaptation planning.

Throughout this chapter, technical concepts are explained as they arise, with the Dominance Index serving as the primary metric for quantifying discourse patterns. Values are presented

systematically across all country groupings to ensure transparency and enable readers to assess the patterns for themselves. While interpretation of what these patterns mean for understanding adaptation governance is reserved for the discussion chapter, the findings presented here provide the empirical foundation for those arguments.

7.1 Topics

The structural topic model identified eight topics that capture how climate adaptation is conceptualized across National Adaptation Plans, with validation through FREX terms, country clustering patterns, and thematic coherence confirming the robustness of topic identification.

The structural topic model identified 8 topics organizing adaptation discourse across National Adaptation Plans. The model optimized semantic coherence and topic exclusivity through an iterative process, ensuring that each topic represents a distinct thematic cluster within the corpus.

Each topic's interpretation relies on multiple validation approaches. FREX (frequency-exclusivity) terms identify distinctive vocabulary that defines each topic. Country clustering patterns provide empirical validation by showing which nations emphasize particular themes. Thematic coherence confirms that the topics represent conceptually unified approaches to adaptation rather than statistical artifacts.

The eight topics organize into three substantive categories that capture different dimensions of adaptation planning. This organization reveals how countries conceptualize adaptation challenges and responses within the constraints of international planning frameworks.

Nap (Topic 8) - 23.1% of corpus. The most prevalent topic exhibits FREX terms “gcf, ndc, unfccc, mainstream, pari, document, step, napa, mandat, chapter” with highest representation in Albania (0.719), Armenia (0.71), revealing the meta-discourse of adaptation planning where countries dedicate substantial attention to discussing the process of planning itself rather than substantive adaptation content.

The semantic field demonstrates procedural orientation around adaptation planning through key terms including “gcf” (Green Climate Fund), “ndc” (Nationally Determined Contributions), “unfccc” (UN Framework Convention), “mainstream” (integration processes), and “document” (planning artifacts). This procedural focus transcends regional boundaries, with administrative elements constituting nearly a quarter of all adaptation discourse across diverse national contexts.

Institutional (Topic 6) - 16.6% of corpus. This topic shows FREX terms “offic, organis, depart, output, divis, partner, busi, perform, partnership, drm” with clustering around South Africa (0.615), Kiribati (0.574), emphasizing organizational arrangements through terms like “offic” (offices), “organis” (organizations), “depart” (departments), “output” (deliverables), and “partnership” (collaborative frameworks).

Combined with *Nap* (Topic 8), these procedural themes account for nearly 40% of total adaptation discourse, indicating that institutional and planning processes systematically dominate substantive adaptation content across all contexts regardless of specific climate vulnerabilities or development challenges.

Poverty (Topic 1) - 12.2% of corpus. This topic exhibits FREX terms “poverti, disrupt, poor, children, percent, migrat, women, growth, sanit, medium-term” with highest representation in Mozambique (0.417), Tonga (0.354), encompassing social vulnerability concerns through key terms including “poverti” (poverty), “poor” (economic status), “children” and “women” (vulnerable populations), “migrat” (population movement), and “sanit” (sanitation infrastructure).

The country pattern represents contexts with significant poverty challenges, validating this topic’s distinctive focus on framing adaptation as poverty reduction rather than environmental response, which reflects how development paradigms shape adaptation conceptualization in economically constrained contexts.

Agriculture (Topic 4) - 11.9% of corpus. This topic shows FREX terms “livestock, climate-resili, wetland, harvest, farm, pest, watersh, altern, wildlif, medium” with clustering around Sri Lanka (0.498), Bangladesh (0.491), encompassing rural livelihoods and farming systems through terms including “livestock” (animal husbandry), “farm” (agricultural systems), “harvest”

(crop production), “pest” (agricultural threats), and “watersh” (watershed management).

The country pattern represents nations with significant rural populations and agriculture-dependent economies, confirming this topic’s sectoral focus on rural adaptation strategies while demonstrating how economic structures influence which aspects of climate vulnerability receive sustained attention in planning documents.

Indigenous (Topic 5) - 9.7% of corpus. This topic exhibits FREX terms “indigen, territori, transit, task, instrument, view, line, refuge, execut, perspect” with highest representation in Israel (0.691), Brazil (0.667), centering on territorial and rights discourse through key terms including “indigen” (indigenous peoples), “territori” (territorial sovereignty), “transit” (transitions), “instrument” (policy tools), and “perspect” (perspectives).

The clustering around contexts with significant indigenous populations validates this topic’s focus on alternative knowledge systems and territorial approaches to adaptation that differ from mainstream frameworks, suggesting some space within adaptation planning for epistemological diversity despite overall procedural dominance.

Climate modeling (Topic 7) - 9.6% of corpus. This topic shows FREX terms “rcp, centuri, day, ensembl, trend, rainfal, precipit, decreas, maximum, confid” with clustering around West Bank and Gaza (0.649), Serbia (0.639), presenting technical vocabulary from climate science through terms including “rcp” (Representative Concentration Pathways), “ensembl” (ensemble modeling), “centuri” (century timeframes), “precipit” (precipitation), and “confid” (confidence intervals).

This topic captures the technical assessment dimension of adaptation planning, representing scientific modeling approaches to understanding climate impacts that operate across different developmental contexts while maintaining standardized methodological frameworks regardless of local knowledge systems or contextual factors.

Coastal (Topic 2) (9.1% of corpus). This topic exhibits FREX terms “sea, tropic, cyclon, coral, coastal, rise, reef, slr, coast, island” with highest representation in Tonga (0.395), Philippines (0.36), encompassing marine and coastal environments through

key terms including “sea” (ocean systems), “coastal” (shoreline areas), “rise” (sea-level rise), “cyclon” (tropical cyclones), “coral” and “reef” (marine ecosystems), and “slr” (sea-level rise abbreviation).

The country pattern represents small island and coastal nations facing direct marine-based climate threats, validating this topic’s geographic specificity while demonstrating how certain environmental challenges generate recognizable thematic clusters within the broader adaptation planning framework.

Irrigation (Topic 3) (7.8% of corpus). The least prevalent topic shows FREX terms “feder, multilater, irrig, hydrometeorolog, percentag, west, mountain, wastewat, law, basin” with clustering around Bosnia and Herzegovina (0.659), Kuwait (0.417), encompassing water infrastructure and management systems through terms including “irrig” (irrigation systems), “hydrometeorolog” (meteorological systems), “mountain” (highland environments), “wastewat” (wastewater management), and “basin” (watershed areas).

The country pattern suggests technical water management approaches that appear across different developmental contexts, indicating shared challenges in water resource adaptation while reflecting how technical frameworks standardize responses to diverse hydrological vulnerabilities through common institutional and engineering approaches.

These eight topics reveal how adaptation discourse is organized across three primary dimensions.

Procedural topics dominate the corpus. *Nap* (Topic 8) and *Institutional* (Topic 6) together account for 39.7% of discourse, emphasizing planning processes over substantive adaptation content.

Sectoral topics address specific domains of vulnerability and response. *Poverty* (Topic 1), *Agriculture* (Topic 4), *Coastal* (Topic 2), and *Irrigation* (Topic 3) represent 41% of discourse, spanning social, agricultural, coastal, and water management challenges.

Cross-cutting topics represent alternative approaches that transcend sectoral boundaries. *Indigenous* (Topic 5) and *Climate_modeling* (Topic 7) constitute 19.3% of discourse, capturing indigenous knowledge systems and technical modeling frameworks respectively.

This topic structure provides the foundation for examining how discourse concentrates within different country groupings, revealing patterns of convergence and divergence in adaptation conceptualization.

7.2 Dominance

Analysis of discourse centralization reveals remarkably high concentration across all National Adaptation Plans, with systematic patterns showing procedural topics dominating adaptation discourse regardless of country context, income level, or geographic vulnerability.

The Dominance Index quantifies discourse centralization by measuring how much the top three most prevalent topics exceed what would be expected from uniform distribution across all eight topics. This normalized metric ranges from 0 (indicating uniform distribution where each topic receives equal attention) to 1 (representing complete concentration where only the top three topics appear), enabling systematic comparison across different country groupings while controlling for the effects of corpus size and topic number.

The analysis reveals that all country groupings demonstrate substantially higher dominance than the baseline of uniform distribution. Across all countries, the overall corpus-level dominance reaches 23% above uniform distribution, representing substantial concentration where the top three topics exceed their expected share by over twenty percentage points. To contextualize this concentration level: uniform distribution would allocate 12.5% to each of eight topics (37.5% total for the top three), while the observed pattern shows the top three topics capturing approximately 60% of total discourse.

The dominance pattern shows that *Nap* (Topic 8) and *Institutional* (Topic 6) appear together in nearly every country grouping's top three topics regardless of their specific climate vulnerabilities or development contexts. This procedural dominance occurs whether countries face sea-level rise, desertification, glacial melt, or other climate challenges, with nations dedicating substantial discourse space to planning processes and

institutional arrangements rather than substantive adaptation content.

Income-based analysis reveals notable variations in discourse centralization while maintaining substantial concentration above uniform distribution baseline across all economic categories. Upper-middle income countries show dominance of 20.4% above baseline with their top three topics focusing on NAP, institutional, irrigation, indicating moderate concentration that combines procedural requirements with technical approaches. Lower-middle income countries display significantly higher dominance at 39.9% above baseline through their emphasis on NAP, institutional, agriculture, while low-income countries show dominance of 34.7% above baseline with their top topics including NAP, Poverty, institutional. The progression across income groups reveals that middle-income countries experience the greatest thematic constraints rather than following a linear relationship between resources and diversity.

Regional patterns demonstrate consistently high discourse centralization above baseline while revealing distinct thematic preferences. Latin America & Caribbean exhibits the highest regional dominance at 49.4% above baseline through their focus on NAP, indigenous, institutional, reflecting emphasis on indigenous rights and territorial approaches alongside procedural requirements. Sub-Saharan Africa shows dominance of 40.4% above baseline through their emphasis on NAP, institutional, Poverty, combining procedural requirements with poverty-reduction approaches. East Asia & Pacific displays dominance of 38% above baseline through their focus on institutional, NAP, coastal, indicating convergence around institutional capacity building alongside coastal vulnerabilities. The substantial concentration levels across all regions occur despite their different institutional contexts and development trajectories.

Geographic vulnerability categories demonstrate how shared environmental challenges translate into discourse patterns while maintaining substantial concentration above baseline. Small Island Developing States show the highest dominance overall at 51% above baseline through their emphasis on institutional, NAP, coastal, combining institutional requirements with coastal-specific concerns despite facing existential climate threats. Landlocked Developing Countries display dominance

of 32.8% above baseline through their focus on NAP, agriculture, Poverty, emphasizing sectoral adaptation approaches alongside procedural requirements. Both geographic categories demonstrate significant thematic concentration while differing primarily in which sectoral topics accompany universal procedural themes.

The temporal analysis reveals how adaptation discourse concentration has evolved over the decade-long period of NAP development. Middle period submissions (2019-2021) show the highest dominance at 43.4% above baseline through their emphasis on NAP, institutional, Poverty, representing peak concentration when procedural requirements became most constraining. Early submissions (2015-2018) display dominance of 20.2% above baseline through their focus on institutional, agriculture, NAP, suggesting initial adaptation planning operated with somewhat greater thematic flexibility. Late submissions (2022-2025) exhibit lower but still substantial dominance at 13.5% above baseline through their emphasis on NAP, Poverty, institutional, suggesting some diversification of adaptation discourse in recent years. The temporal pattern creates a distinctive arc starting from moderate concentration, rising to peak centralization, then declining toward somewhat greater diversity, while maintaining concentration well above uniform distribution throughout all periods.

7.3 Cross-Cutting Patterns

The analysis reveals three fundamental patterns that transcend traditional categories: universal discourse concentration above expected baselines, systematic procedural dominance regardless of context, and statistically significant group differences that follow no coherent organizing logic.

The structural topic modeling and dominance analysis converge on findings that challenge conventional assumptions about how adaptation planning responds to local contexts, economic resources, or environmental vulnerabilities.

The first fundamental pattern emerges from the universal nature of discourse concentration across all country groupings.

Every category analyzed demonstrates dominance values substantially above the baseline of uniform distribution, ranging from 13.5% to 51%. This universal concentration suggests systematic constraints operating across all adaptation planning regardless of the specific circumstances countries face. No group approaches the diverse, distributed discourse that would characterize context-specific adaptation approaches.

The second pattern reveals systematic procedural dominance across virtually all contexts. *Nap* (Topic 8) appears among the top three topics in nearly every country grouping, while *Institutional* (Topic 6) consistently ranks among the most prevalent themes regardless of climate challenges. Together, these procedural topics account for 39.7% of total corpus discourse. This dominance transcends income levels, regional affiliations, geographic vulnerabilities, and temporal periods.

The third pattern emerges from statistical significance testing, which reveals 91.7% of group comparisons showing significant effects (11 of 12 comparisons with $p < 0.05$). These significant differences indicate that group membership genuinely influences discourse patterns rather than reflecting random variation. However, these differences follow no coherent organizing logic.

The income-based analysis exemplifies this paradoxical pattern. Lower-middle income countries show the highest dominance (39.9%), followed by low-income countries (34.7%), then upper-middle income countries (20.4%). This non-linear relationship contradicts expectations that greater economic resources would enable more diverse adaptation approaches, while the significance of these differences (TRUE for lower-middle income, TRUE for low-income) confirms they represent genuine effects rather than random variation.

Regional patterns show significant differences between Latin America & Caribbean (49.4%, significant: TRUE), Sub-Saharan Africa (40.4%, significant: TRUE), and East Asia & Pacific (38%, significant: TRUE). Yet these differences reflect distinct regional emphases rather than systematic variation based on development levels or climate vulnerabilities.

The geographic vulnerability analysis further illustrates this pattern. Small Island Developing States demonstrate the highest dominance overall (51%, significant: TRUE) despite facing urgent and distinctive climate challenges, while Landlocked

Developing Countries show substantial but lower dominance (32.8%, significant: TRUE) despite facing completely different environmental pressures. Both categories show statistically significant differences from the overall corpus, yet their dominance levels cannot be explained by their specific vulnerabilities.

The temporal evolution provides additional evidence for organizing forces that operate independently of systematic learning or capacity development. The significant differences across time periods create an inverted arc where dominance rises from early submissions (20.2%, significant: TRUE) to peak concentration in middle period submissions (43.4%, significant: TRUE), then declines in recent submissions (13.5%, significant: TRUE). This pattern contradicts simple narratives about countries learning to diversify their approaches over time.

These three patterns collectively point to organizing forces that transcend structural categories typically used to understand adaptation planning. The universal concentration above baseline indicates systematic constraints rather than diverse responses to local contexts. The procedural dominance suggests institutional requirements that override environmental imperatives. The significant but non-systematic group differences indicate influences that operate through networks, relationships, and processes that do not align with traditional categories of analysis.

Regional clustering provides the strongest explanatory pattern, suggesting that institutional networks, technical assistance programs, and knowledge brokers operating at regional scales may be more influential than national characteristics in shaping adaptation discourse. The combination of universal concentration, procedural dominance, and significant but non-systematic variation creates an empirical foundation for understanding adaptation planning as shaped by forces that operate through the international development apparatus rather than emerging from local contexts or responding systematically to environmental challenges.

8 Discussion

The main findings indicate that climate adaptation's main organizing principles are fundamentally non-climate related. I argue that the vulnerability/adaptation relation should be understood as an updated form of the underdevelopment/development relation in North-South relations, paving the way for post-development critiques of adaptation.

The findings presented in the previous chapter reveal a striking centralization of adaptation discourse across National Adaptation Plans, with regional institutional networks emerging as the primary explanatory factor for what variation does exist. This brings us closer to understanding how climate adaptation actually functions in the real world, rather than as just a part of the UNFCCC negotiations. The patterns—high discourse homogeneity regardless of climate vulnerabilities, regional clustering that transcends physical geography, and the dominance of financial and procedural concerns—demand theoretical explanation. How can planning documents ostensibly designed to address diverse local climate impacts show such remarkable sameness? Why do countries facing fundamentally different climate futures articulate nearly identical responses? What does it mean that institutional proximity matters more than environmental exposure in shaping adaptation discourse?

This discussion argues that these patterns reveal climate adaptation functioning not as a technical response to environmental change but as a contemporary mechanism of colonial knowledge and power. Through systematic analysis of how adaptation discourse operates, I demonstrate that the vulnerability/adaptation nexus represents an updated version of the underdevelopment/development nexus that has structured North-South relations for decades. Just as development discourse constructed the Third World as lacking and requiring intervention,

adaptation discourse constructs the Global South as vulnerable and requiring assistance—maintaining colonial relations through new vocabularies and institutional arrangements.

The analysis proceeds through four interconnected arguments, each building on the empirical patterns identified through structural topic modeling. First, I examine how the remarkable sameness across NAPs constitutes what has been termed epistemicide—the systematic elimination of alternative ways of knowing and responding to environmental change (Santos 2016). The dominance of financial mechanisms and technical procedures across all contexts reveals not diverse adaptation strategies but the violent imposition of a singular framework that renders other knowledge systems unspeakable. Second, I demonstrate how patterns of discourse convergence, particularly among low-income countries, reveal the active construction of climate vulnerability as a contemporary form of underdevelopment (Escobar 1995). Countries must perform their vulnerability in specific ways to access resources, reinforcing dependencies rather than enabling autonomous responses to environmental change.

Third, I analyze how adaptation planning operates as an anti-politics machine, systematically transforming political questions about justice, responsibility, and structural transformation into technical problems of assessment and implementation (Ferguson 1994). The state-centric nature of adaptation planning combines with its technical character to evacuate political content, making it impossible to address the root causes of vulnerability within the adaptation framework. Finally, I explore what possibilities might exist beyond state-led adaptation, drawing on concepts of autonomy and pluriversal politics to imagine how communities might design their own transitions based on their own knowledge systems and values (Escobar 2018). The variance patterns in the data, particularly among middle-income countries, suggest that even partial autonomy from international climate finance enables more diverse and potentially more appropriate approaches.

Throughout this discussion, I work to connect the quantitative patterns revealed by topic modeling to their theoretical and political implications. The high dominance indices, the regional clustering, the absence of geographic differentiation—these are not merely statistical findings but windows into how power operates through climate governance. By rendering this

Northern discourse legible through computational analysis, we can see how adaptation planning functions to maintain rather than transform the colonial relations that produce vulnerability in the first place. This is not a story of failed implementation or insufficient resources but of a system working precisely as designed—to manage Southern territories and populations according to Northern frameworks while foreclosing alternative futures.

The stakes of this analysis extend beyond academic critique. If adaptation planning operates as epistemicide, if it constructs rather than responds to vulnerability, if it depoliticizes fundamental questions of justice—then current approaches to climate governance are not merely inadequate but actively harmful. They eliminate the knowledge systems and political possibilities that might enable genuine transformation while maintaining the fiction that technical adjustments can address what are fundamentally political problems. Understanding these dynamics is essential for those seeking to support communities facing climate impacts without reproducing colonial relations. The following sections develop each of these arguments in detail, working from the empirical findings toward their theoretical and practical implications.

8.1 The Geography of Sameness: Mapping Epistemicide

The most striking finding from the structural topic modeling is not the diversity of adaptation approaches but their fundamental sameness. Across 45 countries spanning radically different geographies, economies, and climate vulnerabilities, National Adaptation Plans converge on a remarkably narrow set of concerns: financial mechanisms, institutional procedures, monitoring frameworks, and technical assessments. This homogeneity becomes even more pronounced when examining regional clusters, where discourse centralization reaches levels that suggest not mere similarity but active reproduction of identical framings. What we observe is not adaptation to climate change but adaptation to the requirements of international climate finance—a profound narrowing of imaginative possibilities that demands theoretical explanation.

This pattern can be understood through the concept of epistemicide—the destruction of knowledge systems that do not conform to dominant Western scientific and bureaucratic paradigms (Santos 2016). In the context of climate adaptation, epistemicide operates not through direct suppression but through the more subtle violence of exclusion and non-recognition. The NAP process, with its standardized guidelines, technical requirements, and evaluation criteria, creates a discursive space where only certain forms of knowledge can be articulated. Traditional ecological knowledge, community-based practices, indigenous cosmologies, and local innovations—all of which have enabled human communities to navigate environmental variability for millennia—find no legitimate expression in documents dominated by vulnerability indices, cost-benefit analyses, and results-based management frameworks. This represents what critical scholars identify as the continuation of colonial violence through seemingly neutral technical processes (Dunlap 2018; Escobar 2018).

The topic modeling results make this epistemicide quantitatively visible. When financial mechanisms and project management dominate the discourse across all countries, we witness the triumph of a particular way of knowing—one that frames climate adaptation as fundamentally a problem of resource allocation and technical implementation rather than social transformation or ecological relationship. The marginal presence of topics related to traditional knowledge or community practices (appearing in less than 3% of the corpus) reveals not what countries choose to exclude but what the NAP framework renders literally unspeakable. This echoes broader patterns in how Western knowledge systems establish themselves as universal while denying the validity of other ways of knowing (Escobar 2020; Mignolo 2011).

The regional clustering patterns add another dimension to this analysis. That countries within regions show higher discourse similarity than countries facing similar climate impacts reveals how epistemicide operates through institutional networks. Regional development banks, technical assistance programs, and expert consultancies create networks of what development anthropologists term “development brokers”—intermediaries who translate global frameworks into local contexts while fundamentally maintaining the underlying epistemological assumptions (Lewis and Mosse 2006; Mosse 2011). These brokers do not

simply facilitate knowledge transfer; they actively shape what counts as legitimate knowledge about adaptation. The same consultants working across multiple countries within a region create the patterns of convergence observed in our analysis, functioning as what critical scholars identify as carriers of “expert” knowledge that marginalizes local understandings (Bierschenk, Chauveau, and de Sardan 2002; Brinks and Donner 2025).

The role of consultants in this process deserves deeper theoretical attention through the lens of what has been termed “tools for conviviality” (Illich 2009). In this framework, tools shape their users as much as users shape tools—creating dependencies and constraining possibilities even as they appear to enhance capabilities. The consultant is simultaneously a tool (employed by development institutions), a user of tools (frameworks, templates, assessment methodologies), and a producer of tools (standardized NAPs). This creates a recursive loop where the tools of adaptation planning—vulnerability indices, logical frameworks, results matrices—shape how consultants think, which shapes how countries must present their realities, which in turn reinforces the legitimacy of these same tools. The consultant arrives with a toolkit developed in Washington or Geneva, applies these tools across diverse contexts, and produces documents that confirm the validity of the original framework. Countries learn to see themselves through these tools, to articulate their needs in the language these tools recognize, and ultimately to reshape their own understanding of climate vulnerability to match what the tools can measure (Illich 2009).

The dominance of multilateral development banks in shaping adaptation discourse deserves particular attention. These institutions occupy a peculiar position—closer to Northern think tanks than Southern realities, yet positioned as intermediaries serving Southern needs. Their technical assistance programs, funding criteria, and knowledge products create powerful incentives for countries to frame adaptation in particular ways. This reflects what critics have long identified as the “will to improve” that characterizes development interventions—a desire to intervene that shapes both problems and solutions in ways that justify continued engagement (Li 2007). The convergence we observe is not accidental but structured by these institutional relationships, echoing patterns identified in earlier

critiques of how development creates dependencies rather than autonomy (Illich 2009; Escobar 1995).

This process of epistemicide through adaptation planning is particularly insidious because it operates under the banner of helping vulnerable countries. Unlike earlier forms of colonial knowledge imposition, which at least could be recognized and resisted as foreign, the NAP process invites countries to participate in their own epistemological subordination. Countries must demonstrate they lack capacity (to secure technical assistance), adopt external frameworks (to access funding), and report in standardized formats (to maintain eligibility). This represents what scholars identify as a form of violence that operates through inclusion rather than exclusion—incorporating diverse contexts into a singular framework that eliminates their distinctiveness (Dunlap 2018; Whyte 2018).

What makes this epistemicide through adaptation particularly effective is its technical character. By framing adaptation as a matter of proper assessment, planning, and implementation, the NAP process removes it from the realm of political contestation. This transformation—from the political to the technical—represents the operation of what critical development scholars have long identified as central to maintaining unequal power relations while appearing to address them (Ferguson 1994; Escobar 2018).

8.2 Vulnerability is the New Underdevelopment

The patterns of discourse convergence among low-income countries reveal a disturbing parallel to earlier development paradigms. Where development discourse constructed the “Third World” as lacking—lacking capital, lacking technology, lacking institutions—adaptation discourse constructs these same countries as vulnerable—vulnerable to floods, vulnerable to droughts, vulnerable to climate change (Escobar 1995). This shift from “underdeveloped” to “vulnerable” maintains the same structural relationship: countries in need of external intervention, incapable of managing their own futures, requiring the technical expertise and financial resources of the developed world. The vulnerability/adaptation nexus

thus emerges as the contemporary incarnation of the development/underdevelopment relationship that has structured North-South relations for decades.

The topic modeling results provide empirical evidence for this constructed vulnerability. Low-income countries show the second-highest level of discourse centralization (0.980), converging overwhelmingly on topics related to finance, capacity building, and institutional frameworks. This convergence does not reflect shared climate vulnerabilities—the low-income category includes both small island states facing sea-level rise and landlocked countries confronting desertification. Instead, it reflects their shared position in the global political economy as recipients of climate finance. Their NAPs read less as sovereign responses to environmental change and more as grant applications to international donors, carefully crafted to demonstrate both need and competence in terms legible to funding institutions.

This construction of vulnerability operates through what has been termed “anticipatory ruination”—the rendering of certain places as already lost, thereby justifying radical interventions that might otherwise face resistance (Paprocki 2018). In Bangladesh, this anticipatory ruination has justified the transformation of agricultural lands into shrimp farms, the displacement of rural communities, and the promotion of labor migration—all in the name of adaptation (Paprocki 2019). The NAPs in our corpus show similar patterns: countries are encouraged to imagine themselves as future victims of climate change, to inventory their vulnerabilities, and to propose interventions that align with existing development paradigms. This process of imagining dystopian futures creates what scholars identify as a “climate of fear” that enables particular forms of intervention while foreclosing alternatives (Hulme 2008). The future is foreclosed before it arrives, with adaptation pathways predetermined by institutional templates rather than community aspirations.

The use of climate change as what researchers term a “spice” for conventional development projects reveals how vulnerability construction serves multiple purposes (Dewan 2022). In coastal Bangladesh, the same infrastructure projects that failed under development rationales—embankments, polders, flood controls—are repackaged as climate adaptation despite evidence they exacerbate the problems they claim to solve

(Dewan 2021). The NAPs show similar patterns of recycling, where conventional sectoral interventions in agriculture, water, and infrastructure are reframed as adaptation measures. Climate vulnerability thus becomes a new justification for old interventions, a pattern that extends beyond specific countries to encompass entire regions constructed as sacrifice zones for continued extraction (Tornel 2024).

The financial and procedural focus that dominates low-income country NAPs reveals how vulnerability construction serves institutional needs. These countries must perform their vulnerability in specific ways—through vulnerability assessments, risk matrices, and adaptation prioritizations—to access climate finance. Yet this performance requires a particular kind of capacity: the ability to produce documents legible to international institutions, to navigate complex funding mechanisms, and to report in standardized formats. Countries must simultaneously demonstrate vulnerability (to justify funding) and capacity (to manage funding), a contradictory position that reinforces their subordinate status in the climate finance architecture. This paradox reflects broader patterns in how environmental interventions create new forms of capture and control (Cons 2021).

The middle-income countries in our analysis present an intriguing counterpoint. They show the lowest levels of discourse centralization (lower-middle at 0.941, upper-middle at 0.958), suggesting greater autonomy in framing adaptation. This variance might reflect their intermediate position—less dependent on climate finance than low-income countries, yet not fully integrated into Northern knowledge networks like high-income countries. Their NAPs show more diverse topics, including attention to local contexts and specific sectoral concerns that escape the homogenizing pressure of donor requirements. This pattern suggests that partial autonomy from the climate finance system enables more diverse and potentially more appropriate adaptation framings, echoing findings about how frontier spaces sometimes escape full capture by dominant systems (Eilenberg 2015).

The construction of vulnerability through adaptation discourse has material consequences beyond the discursive realm. When vulnerability is framed primarily in terms of institutional capacity and financial resources, the solutions inevitably focus

on capacity building and resource transfer rather than addressing structural causes of vulnerability. The NAPs show little attention to questions of land rights, resource extraction, unfair trade relationships, or other political-economic factors that shape vulnerability. This reflects what critics identify as “climate reductionism”—the tendency to attribute all social and environmental problems to climate change while ignoring their deeper structural causes (Hulme 2011, 2023). Vulnerability appears as a technical condition requiring technical solutions—seawalls for coastal areas, drought-resistant seeds for agricultural regions, early warning systems for disaster-prone zones. These interventions may provide temporary relief but do not challenge the systems that produce vulnerability in the first place.

This technical framing of vulnerability serves multiple functions in the contemporary world order. For donor countries, it justifies continued intervention in the South while avoiding questions about their own contribution to climate change or structural inequality. For recipient country governments, it provides access to resources and legitimacy as responsible managers of adaptation. For the constellation of consultants, development organizations, and financial institutions that mediate these relationships, it ensures continued relevance and funding. Only for the communities whose vulnerability is ostensibly being addressed does this framing offer little—their knowledge remains marginalized, their agency constrained, and their futures determined by distant institutions. This represents what scholars identify as development-induced displacement masquerading as climate adaptation (Dewan 2021; Paprocki 2019).

The parallel between vulnerability construction in adaptation and underdevelopment in earlier paradigms extends to the solutions proposed. Just as development promised modernization through capital investment and technical assistance, adaptation promises resilience through climate finance and capacity building. Both paradigms assume that Southern countries lack something fundamental that Northern countries can provide. Both create dependencies rather than autonomy. Both transform diverse local realities into standardized problems amenable to standardized solutions. The persistence of these patterns across different issue areas and historical periods suggests deep structural continuities in North-South relations that surface-level policy changes cannot address. The shift from development to

adaptation represents not a break with colonial relations but their continuation through new vocabularies and institutional arrangements (Escobar 1995, 2018). ## The Anti-Politics Machine in Climate Governance

The technical character of adaptation discourse exemplifies the operation of what has been termed the “anti-politics machine”—the process by which fundamentally political questions are transformed into technical problems requiring bureaucratic solutions (Ferguson 1994). Climate change adaptation involves profound political choices: whose knowledge counts, which communities receive protection, what futures are possible, how resources are distributed, and who bears responsibility for climate impacts. Yet the NAPs in our corpus systematically evacuate these political dimensions, replacing them with technical assessments, institutional procedures, and managerial frameworks. This depoliticization is not accidental but serves specific functions in maintaining existing power relations while appearing to address climate vulnerability.

The dominance of procedural and technical topics across all NAPs—monitoring frameworks, institutional arrangements, assessment methodologies—reveals how adaptation governance operates to render political questions technical. When countries must express their adaptation needs through logical frameworks, results-based management systems, and standardized indicators, the space for political contestation shrinks dramatically. Questions about why certain communities are vulnerable, how colonial histories shape present exposures, or whether proposed adaptations might exacerbate inequalities cannot be articulated within these technical formats. This reflects what scholars identify as the systematic depoliticization of environmental governance, where technical solutions obscure the power relations that produce environmental problems (Li 2007; Nightingale et al. 2020).

The state-centric nature of the NAP process intensifies this depoliticization. By positioning national governments as the primary agents of adaptation planning, the UNFCCC framework privileges certain actors and scales while marginalizing others. States become the interlocutors for international finance, the arbiters of adaptation priorities, and the implementing agencies for interventions. This state-centricity serves multiple depoliticizing functions: it legitimizes existing governance

structures, channels resources through established bureaucracies, and frames adaptation as a matter of proper administration rather than political transformation. Yet states themselves are often implicated in producing the vulnerabilities that adaptation claims to address—through forced displacement, resource extraction, or development policies that prioritize economic growth over community well-being (Eilenberg 2022).

The empirical finding that geographic vulnerability explains almost no variance in adaptation discourse (only 1.8%) while regional institutional factors dominate reveals the depth of this depoliticization. If adaptation planning truly responded to climate impacts, we would expect countries facing similar physical challenges to develop similar approaches. Instead, the dominance of regional patterns suggests that institutional templates and bureaucratic networks shape adaptation discourse far more than actual climate vulnerabilities. This represents what critical scholars identify as “seeing like a state”—the reduction of complex socio-ecological realities to simplified categories amenable to bureaucratic intervention (Scott 1998). The NAPs make countries legible to international climate finance institutions but in doing so obscure the messy realities of how communities actually experience and respond to environmental change.

The transformation of climate vulnerability into technical problems creates what scholars term “rendering technical”—a process that defines problems and solutions in ways that align with available tools and institutional capacities (Li 2007). Our topic modeling reveals this process quantitatively: the prevalence of topics related to data collection, modeling, assessment tools, and monitoring systems shows how adaptation planning privileges what can be measured, modeled, and managed. Complex questions about justice, responsibility, and alternative futures are reduced to indicators, targets, and deliverables. This technical rendering serves institutional needs—donors require measurable results, implementing agencies need clear procedures, and governments want demonstrable achievements—but may have little relevance to how communities experience climate impacts or envision adaptation.

The focus on vulnerability assessments and risk modeling exemplifies this anti-political operation. These tools appear as neutral, scientific approaches to understanding climate impacts, yet they embed particular assumptions about what constitutes

vulnerability, whose knowledge counts in assessing it, and what kinds of interventions are appropriate. Vulnerability indices typically privilege quantifiable physical exposures and economic assets while marginalizing social relationships, cultural values, and political factors that shape how communities experience and respond to change. This represents what critics identify as the “scientization” of inherently political questions, where model outputs and expert assessments substitute for democratic deliberation about values, priorities, and futures (Hulme 2011; Nightingale et al. 2020).

The procedural focus that dominates adaptation discourse—with extensive attention to institutional arrangements, coordination mechanisms, and governance frameworks—further depoliticizes adaptation by suggesting that better administration can solve what are fundamentally political problems. If communities are vulnerable because of land dispossession, the solution is not better coordination between ministries. If fishing villages face increased storm exposure because of mangrove destruction for shrimp farms, the answer is not improved early warning systems. Yet the NAPs consistently frame adaptation challenges as matters of institutional capacity, inter-agency coordination, and information management. This reflects broader patterns in how international development depoliticizes poverty and inequality by focusing on technical and institutional solutions (Ferguson 1994; Escobar 1995).

The absence of certain topics in the NAPs is as revealing as what appears. Our analysis shows minimal attention to issues of land rights, resource extraction, trade relationships, debt, or other structural factors that shape vulnerability. Historical responsibility for climate change appears nowhere in the dominant topics. Questions of reparations, compensation, or fundamental economic restructuring—all central to climate justice movements—find no expression in these technical documents. This absence is not oversight but structured silencing, where the format and requirements of adaptation planning systematically exclude political critique. As scholars note, such systematic exclusions reveal how states and international institutions actively “unknow” politically inconvenient realities (Figueroa-Helland and Borg 2014; Whyte 2020).

The anti-politics machine of adaptation serves multiple constituencies even as it fails those most vulnerable to climate impacts. For donor countries, it transforms moral and political

obligations into voluntary technical assistance, avoiding questions about historical emissions or ongoing extraction. For international institutions, it creates a manageable problem space amenable to existing tools and procedures. For national governments, it provides resources and legitimacy while avoiding challenges to existing power structures. For the adaptation industry—consultants, NGOs, research institutions—it ensures continued relevance and funding. This alignment of interests helps explain the persistence of depoliticized adaptation despite mounting evidence of its inadequacy (Eriksen et al. 2021; Scoville-Simonds, Jamali, and Hufty 2020).

The operation of adaptation as an anti-politics machine connects directly to our earlier analysis of epistemicide and vulnerability construction. By rendering political questions technical, adaptation planning eliminates space for alternative knowledge systems that might frame problems differently. By constructing vulnerability as a technical condition requiring technical solutions, it forecloses political mobilization around structural causes. The three processes work together to maintain existing power relations while appearing to address climate impacts. This brings us to the crucial question: if state-led adaptation planning operates as an anti-politics machine that forecloses alternative futures, what possibilities exist beyond this framework?

8.3 Beyond State Adaptation: Pluriversal Possibilities

If adaptation planning operates as a mechanism of epistemicide, vulnerability construction, and depoliticization, what alternatives might exist? The variance patterns in our data—particularly the greater discourse diversity among middle-income countries—suggest that partial autonomy from international climate finance enables more diverse approaches. This empirical finding aligns with theoretical work on pluriversal politics that imagines worlds beyond the singular world of modernity, development, and now adaptation (Escobar 2018, 2020). Rather than seeking better adaptation within existing frameworks, these approaches ask: what if communities designed their own transitions based on their own ontologies, epistemologies, and aspirations?

The concept of autonomy provides a crucial entry point for reimagining adaptation beyond the state (Escobar 2018). Autonomy here does not mean isolation or pure self-sufficiency but rather the capacity of communities to determine their own paths based on their own knowledge systems and values. The Zapatista concept of “mandar obedeciendo” (governing by obeying) exemplifies this approach—leadership that responds to community needs rather than imposing external frameworks (Escobar 2020). In the context of climate adaptation, autonomy would mean communities identifying their own vulnerabilities (which might not align with technical assessments), developing their own responses (which might not fit donor categories), and evaluating success by their own criteria (which might not translate into indicators).

The middle-income variance in our data offers tantalizing glimpses of what partial autonomy enables. These countries, less dependent on climate finance and technical assistance, show greater diversity in their adaptation framings. They incorporate more place-specific concerns, sectoral particularities, and diverse knowledge sources. While still operating within the NAP framework, they demonstrate that even limited autonomy from financial dependencies creates space for more contextually appropriate approaches. This suggests that the homogenization we observe among low-income countries is not inevitable but produced by specific institutional arrangements that could be otherwise (Demaria et al. 2023; Escobar 2021).

Indigenous movements across the globe offer concrete examples of adaptation beyond state frameworks that our methodology cannot capture but that point toward possibilities (Corntassel 2021). These approaches typically begin from fundamentally different premises: relationships with land rather than ownership of resources, reciprocity with non-human beings rather than ecosystem services, intergenerational responsibility rather than discount rates. When indigenous communities in the Americas speak of climate change, they often frame it as symptomatic of deeper relational failures that require healing relationships rather than technical fixes (Whyte 2018, 2020). Such framings cannot appear in NAPs because they exceed what adaptation planning can recognize as legitimate knowledge.

The call for decolonization in climate governance goes beyond incorporating indigenous knowledge into existing frameworks—

a move that often serves to further marginalize and extract from indigenous communities (Tuck and Yang 2012). Instead, decolonization would mean recognizing indigenous sovereignty over territories and waters, returning stolen lands, and acknowledging that indigenous peoples have been adapting to environmental variability for millennia without international assistance. This is not metaphorical but material: land back means actual return of territories to indigenous governance, fundamentally challenging the state-centric framework of adaptation planning. Such approaches recognize that for many communities, the state itself is a source of vulnerability rather than adaptation (Deranger et al. 2022).

The pluriverse—a world where many worlds fit—offers a framework for thinking beyond the singular world of adaptation planning (Escobar 2018; Reiter 2018). This is not relativism but recognition that different peoples inhabit genuinely different worlds with different relationships to what the West calls “nature” and “climate.” The Andean concept of “*buen vivir*,” the African philosophy of “*ubuntu*,” and countless other non-Western ontologies offer different starting points for understanding human-environment relationships that might generate entirely different approaches to environmental change (Demaria et al. 2023). These are not alternative “adaptations” but alternative worlds where the adaptation/vulnerability framing might not even make sense.

The concept of “provincializing Europe” helps understand what moving beyond state adaptation might entail (Chakrabarty 2009). Rather than accepting European-derived categories (including the state, development, and adaptation) as universal, this approach reveals them as particular, historical products that achieved global dominance through colonial violence. Provincializing adaptation would mean recognizing it as one possible response to environmental change emerging from specific historical and institutional contexts, not a universal framework that all must adopt. This opens space for other histories, knowledge systems, and futures that have been suppressed by the universalizing tendencies of Western modernity (Mignolo 2011; Quijano and Ennis 2000).

The practical implications of moving beyond state adaptation are profound and challenging. It would mean redirecting climate finance from state bureaucracies to autonomous community organizations. It would mean recognizing knowledge sys-

tems that international institutions cannot easily quantify or control. It would mean accepting outcomes that do not fit into logical frameworks or results matrices. Most fundamentally, it would mean Northern countries addressing their own emissions and consumption rather than reshaping Southern societies through adaptation planning. As critics note, perhaps the most effective adaptation support would be rapid industrial decarbonization in the North, eliminating the problem at its source rather than managing its symptoms in the South (Eriksen et al. 2021).

The barriers to such transformation are substantial. States jealously guard their sovereignty and their role as intermediaries for international resources. International institutions have invested heavily in frameworks, procedures, and expertise oriented toward state-led planning. The adaptation industry depends on continued funding for assessments, capacity building, and project implementation. Moving beyond state adaptation would threaten all these interests. Yet our analysis reveals that current approaches produce homogenization, depoliticization, and epistemicide—outcomes that serve institutional needs while failing those most vulnerable to climate impacts.

The high discourse centralization documented in this research should not lead to despair but to clarity about the nature of the challenge. The adaptation regime, like the development regime before it, is not a natural or inevitable response to environmental change but a historically specific configuration of power that can be contested and transformed. The cracks in the system—the variance among middle-income countries, the persistence of community-based practices despite their marginalization, the growing critique from scholars and activists—suggest that other worlds remain possible. Whether these possibilities can flourish depends not on better planning or more finance but on fundamental shifts in power relations between North and South, states and communities, experts and inhabitants.

This analysis returns us to fundamental questions about climate justice that transcend the technical framings of adaptation planning. If adaptation operates as a contemporary form of colonialism—imposing Northern frameworks, eliminating alternative knowledges, and foreclosing autonomous futures—then climate justice requires more than reformed institutions or increased finance. It requires recognizing and supporting the multiple worlds that exist beyond the singular world of development

and adaptation. The implications of this recognition form the basis for our concluding reflections on the future of climate governance and the possibilities for genuine transformation in North-South relations.

9 Conclusion

Nemik: “Freedom is a pure idea. It occurs spontaneously and without instruction. Random acts of insurrection are occurring constantly throughout the galaxy. There are whole armies, battalions that have no idea that they’ve already enlisted in the cause.”

This thesis began with a simple observation: climate adaptation has become central to North-South relations, positioned as a solution to the injustices of climate change. The “\$100 billion promise” made at Copenhagen, the proliferation of adaptation funds, and the mainstreaming of adaptation into development all suggest a global commitment to helping vulnerable countries prepare for climate impacts. Yet the analysis of 45 National Adaptation Plans reveals a troubling reality. Rather than diverse responses to diverse vulnerabilities, we find remarkable homogeneity—a discourse centralization of 0.956 that speaks more to institutional capture than climate response. The patterns uncovered through structural topic modeling answer the three questions posed at the outset in ways that fundamentally challenge the adaptation enterprise.

What view of climate justice does adaptation have? The dominance of financial mechanisms and procedural frameworks across all NAPs reveals adaptation’s impoverished vision of justice. Climate justice is reduced to resource transfer—getting the right funds through the right channels to the right recipients. Vulnerability appears as a technical deficiency requiring Northern expertise rather than a product of historical and ongoing colonial relations. The near-absence of topics related to rights, reparations, or structural transformation shows how adaptation planning systematically excludes more expansive visions of justice. Countries must frame their needs in terms of institutional capacity and project pipelines rather than land sovereignty or economic restructuring. This is not climate

justice but its bureaucratic simulation—a performance that maintains the very relations that produce vulnerability.

How are climate adaptation interventions justified, and who decides? The variance decomposition provides a stark answer: regional institutional networks explain 20.1% of discourse patterns, while the actual geography of climate vulnerability explains merely 1.8%. This reveals adaptation planning as shaped by development banks, regional organizations, and the consultants who move between them—not by communities facing sea-level rise or desertification. The justification comes through technical assessments that construct vulnerability in particular ways, rendering complex political realities as manageable technical problems. The tools of adaptation—vulnerability indices, logical frameworks, monitoring systems—become what shapes adaptation possibilities (Illich 2009). Countries learn to see themselves through these tools, to articulate needs these tools recognize, creating the convergence we observe.

Is climate adaptation effective for delivering climate justice? The empirical evidence compels a negative answer. High discourse centralization reveals adaptation operating as epistemicide, systematically eliminating alternative ways of knowing and responding to environmental change (Santos 2016). The convergence among low-income countries shows vulnerability being constructed rather than addressed, echoing how development discourse produced underdevelopment (Escobar 1995). The dominance of technical and procedural concerns confirms adaptation functioning as an anti-politics machine, transforming questions of justice into matters of administration (Ferguson 1994). Rather than enabling communities to navigate environmental change according to their own knowledge and values, adaptation planning imposes a singular framework that forecloses alternatives while appearing to help.

9.1 Theoretical Contributions

This research makes several theoretical contributions by providing empirical validation for post-development critiques of climate governance. First, it demonstrates quantitatively what critical scholars have argued qualitatively: that adaptation represents not a break from development paradigms but

their continuation through new vocabularies. The vulnerability/adaptation nexus emerges as the contemporary form of the underdevelopment/development nexus, maintaining colonial relations while appearing to address their consequences. Second, the analysis operationalizes the concept of epistemicide, showing how it occurs not through dramatic suppression but through the quiet violence of bureaucratic frameworks that render alternative knowledge systems literally unspeakable in planning documents.

Third, the research bridges critical theory and computational methods, demonstrating how topic modeling can reveal patterns of power and knowledge that might otherwise remain hidden in the sheer volume of policy documents. By making Northern adaptation discourse legible—showing its repetitions, convergences, and silences—we can better understand how power operates through seemingly neutral technical processes. The method reveals not what Southern countries think about adaptation but what they must say to participate in international climate governance. This distinction is crucial for understanding adaptation planning as a technology of governance rather than genuine response to climate impacts.

Finally, the analysis contributes to understanding the specific mechanisms through which colonial relations reproduce themselves in contemporary environmental governance. The regional clustering patterns reveal the crucial role of intermediary institutions and development brokers in creating discursive homogeneity. The state-centric nature of planning combined with technical requirements creates conditions where only certain actors can speak and only certain things can be said. These mechanisms operate not through coercion but through the promise of resources, creating self-reinforcing cycles where countries must perform vulnerability to access funds that reinforce their dependent status.

9.2 The COP-out

The title of this thesis carries a double meaning that the analysis confirms. Adaptation finance represents both a literal “Conference of Parties outcome”—the institutional response to demands for climate justice—and a “cop-out” in the colloquial sense—an evasion of responsibility. While Southern countries

reshape their societies through adaptation planning, Northern countries continue the emissions that drive climate change. The Paris Agreement's careful separation of mitigation, adaptation, and loss and damage serves this evasion, allowing wealthy countries to provide "support" for adaptation while avoiding binding emissions reductions or accepting liability for climate damages.

The irony is profound: homogeneous planning for heterogeneous impacts. Countries facing fundamentally different climate futures—small islands confronting submersion, mountain regions losing glaciers, drylands facing intensified droughts—produce remarkably similar documents focused on institutional arrangements and financial mechanisms. This homogeneity reveals adaptation planning serving institutional rather than environmental purposes. It creates legible subjects for climate finance, standardized problems for technical assistance, and manageable interventions for development agencies. Meanwhile, the actual diversity of climate impacts and potential responses remains largely unaddressed.

The recent COP29 pledge of \$300 billion in climate finance by 2035 continues this pattern. Framed as a triumph of multilateralism, it represents another decade of focusing on adaptation in the South rather than mitigation in the North. The logic of the climate damage flowchart remains reversed: rather than stopping emissions at the source, the international community invests in managing symptoms at the periphery. This is not mere inefficiency but active displacement—every dollar spent on adaptation planning is a dollar not spent on industrial transformation in the countries actually driving climate change.

The systematic exclusion of loss and damage from adaptation planning, despite its formal recognition in the Paris Agreement, reveals the limits of acceptable discourse. Countries can discuss future vulnerabilities and adaptation needs but not present damages and historical responsibility. They can request capacity building but not reparations. They can plan for resilience but not demand compensation. These exclusions maintain the fiction that climate change is a future problem requiring technical preparation rather than a present injustice requiring political transformation.

9.3 Future Research Directions

This analysis opens several critical avenues for future research. First, studying community responses outside state frameworks could reveal the alternative epistemologies and practices that NAPs systematically exclude. How do fishing communities, forest dwellers, and pastoralists actually navigate environmental change? What knowledge systems guide their responses? How do these differ from state plans? Such research requires methods that can capture knowledge expressed through practice rather than policy documents.

Second, tracking how adaptation projects actually unfold on the ground could illuminate the gap between planning and reality. Do the homogeneous plans produce homogeneous outcomes? How do communities resist, reshape, or repurpose adaptation interventions? What happens when technocratic plans meet complex social realities? Understanding implementation could reveal both the limits of planning and the spaces where alternatives emerge.

Third, the “cracks” in the system deserve deeper investigation. Why do middle-income countries show greater discourse diversity? What enables their partial autonomy? Could these spaces of relative freedom provide models for escaping the adaptation regime? Similarly, examining regional variations could reveal how different institutional configurations enable or constrain alternative approaches.

Finally, developing methods for amplifying marginalized knowledge systems remains crucial. If current research methods privilege written documents and formal institutions, how might we develop approaches that recognize oral traditions, embodied practices, and communal knowledge? This is not merely a methodological challenge but a political one—requiring researchers to question their own role in either reproducing or challenging epistemicide.

9.4 Whose Futures?

This thesis began with questions about climate justice and power: who gets to imagine whose future in a changing climate? The analysis provides a clear if troubling answer.

Through the apparatus of adaptation planning, Northern institutions imagine Southern futures. They determine what counts as vulnerability, what constitutes appropriate response, and what makes successful adaptation. Southern countries must translate their complex realities into forms these institutions recognize—vulnerability assessments, logical frameworks, project documents—or remain excluded from climate finance.

The patterns revealed through topic modeling show this is not climate adaptation but institutional adaptation. Countries adapt not to changing rainfall or rising seas but to donor requirements and funding criteria. They develop the capacity not to navigate environmental change but to navigate international bureaucracies. The knowledge that matters is not traditional ecological wisdom or community innovation but the ability to produce documents that secure resources. This represents a profound foreclosure of possibilities—eliminating alternative futures before they can be imagined.

The necessary shift requires recognizing that communities have always adapted to environmental variability and continue to do so outside state and international frameworks. Before NAPs, before UNFCCC, before development itself, human communities developed sophisticated ways of living with environmental uncertainty. These approaches—based on reciprocity rather than resource management, embedded in place rather than abstracted into models, responsive to local rather than global signals—persist despite their marginalization. Supporting them requires not new planning frameworks but stepping back from the pretense that adaptation must be managed from above.

The paradox that emerges from this analysis is that effective climate justice may require less adaptation planning, not more. Each NAP, each vulnerability assessment, each project document further entrenches the frameworks that produce homogenization and epistemicide. Rather than reformed institutions or increased finance, climate justice requires fundamentally different starting points—recognizing indigenous sovereignty, supporting community autonomy, addressing structural drivers of vulnerability. Most fundamentally, it requires Northern countries to rapidly reduce their own emissions rather than reshaping Southern societies through adaptation planning.

This brings us to a stark choice that extends beyond climate governance to the future of North-South relations. Do we continue down the path of epistemicide—eliminating knowledge diversity, imposing singular frameworks, foreclosing alternative futures? Or do we nurture the pluriverse—recognizing multiple ways of knowing and being, supporting diverse responses to environmental change, enabling communities to create their own futures? The high discourse centralization documented in this research shows the current path leads toward homogenization, depoliticization, and continued colonial relations disguised as climate response.

The 100 billion dollar question is not whether wealthy countries will provide adaptation finance—they already are, and will likely provide more. The question is whether this finance will continue to operate as a COP-out, allowing the North to avoid fundamental changes while appearing to help the South. The answer lies not in better planning or more resources but in recognizing that climate justice cannot be delivered through the same institutions and frameworks that produce climate injustice. Real transformation requires abandoning the pretense that Northern institutions can manage Southern adaptation. It requires recognizing that the most effective adaptation support the North can provide is to stop driving the climate change that makes adaptation necessary in the first place. Until then, adaptation remains what this analysis reveals it to be: not climate justice but its most sophisticated evasion.

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