

100 billion dollar COP-out

A critical analysis of the illusions and realities of climate adaptation

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Abstract

Climate adaptation has emerged as a defining paradigm of North-South relations in the 21st century, positioned at the intersection of development, security, and environmental governance. This thesis examines the tension between calls for diverse ontological and epistemological approaches to adaptation and the apparent homogeneity in adaptation practice, developing a methodological approach to empirically measure discourse centralization.

Through analysis of 45 National Adaptation Plans submitted to the UNFCCC, this research applies structural topic modeling and a novel “Dominance Index” to assess the degree to which adaptation discourse reflects plurality or uniformity. The findings reveal that adaptation discourse clusters most strongly by region rather than income level or geography, suggesting regional epistemic communities may have greater influence than either global frameworks or local knowledge systems in shaping how climate vulnerability is conceptualized and addressed.

Viewed through the lens of Human Security and critical future studies, these patterns offer insights into power dynamics in climate governance. The regional clustering pattern complicates the binary opposition between the pragmatic “adaptation nexus” approach and the critical “adaptation regime” perspective, revealing a more complex landscape of knowledge production that has significant implications for the future of adaptation as a framework for addressing climate vulnerability in North-South relations.

Acknowledgements

1 Introduction

Climate change is dangerous, unfair and already here.

Climate action has become a global phenomenon, a common story and goal, to different peoples in wildly different contexts. The action is motivated by urgency and agency, moralism and utility. Everyone wants to achieve climate justice, but how, and for whom?

The stories I have been exposed to span, “We need climate action to stay competitive in the world markets”, “We need climate action to save biodiversity”, “I need people to buy carbon credits so I can put food on the table”. Needless to say, this list could be much longer. The many actors and overlapping stories make this field hard to capture and describe. The main goal of this thesis is to highlight the ways the stories collide.

Climate justice could be imagined as a spillover effect. Greenhouse gas emissions lead to changes in ecosystems, ecosystem change could lead to damages. If these damages fall exclusively (or disproportionately) on other than those responsible for the emissions, this is climate injustice. Climate mitigation are actions taken to avoid the emissions in the first place, also often referred to as a green transition. Climate adaptation are actions taken to avoid damages from ecosystem change, this is often also called climate security. Loss and damage is compensation for damages incurred. The negotiations at the United Nations Framework Convention for Climate Change (UNFCCC) often tries to find an optimal outcome, political economy wise.

Climate adaptation is a form of anticipatory governance, where the future is predicted and imagined, and measures are taken to reduce risk. There is a large degree of uncertainty, both in the actual events (hurricanes, cyclones, droughts and floods) and their impacts. The quantification of this risk is also uncertain, as value is understood differently between contexts, and might change over time. In other words, how one views climate adaptation is based on a tapestry of assumptions of the world.

Our worldviews are made up by the stories we share. They structure our world, assign our roles and tells us who to listen to. They shape what we deem reasonable, acceptable and preferable. They justify our actions, and tells us who belongs and should be excluded. In the global North, we assume this story to be universal, a claim that decolonial scholars challenge. Rather, they argue that the stories we tell, the knowledge systems we surround ourselves with, are a site of power struggle, where the dominant systems systematically eliminate the others. This thesis engages with this claim empirically.

[Societies change when our worldviews are challenged. Major changes, such as the suffragettes, the civil rights movement etc.etc. were struggles about *who counts*. Former colonies were

granted their freedom because they were now seen as nations in their own right. By engaging with the stories that justified the oppressions of women and minorities, the natural conclusion became that everyone are *people*. This is despite the law saying otherwise.]

[As I am writing this thesis, the world is experiencing the opposite development. The Putin regime claims Ukrainians do not exist, the Trump regime claims transgender peoples do not exist.]

This thesis argues that the current climate regime re-tells the story of underdevelopment.

1.1 Scope

This thesis is based on text-mining and topic modeling all National Adaptation Plans (NAPs) submitted to the UNFCCC. This analysis squarely targets the official policy documents submitted to the UNFCCC. It recognizes, and highlights, that these countries rarely are perfect representatives of their citizens. I use this

This thesis addresses three central research questions:

- What view of climate justice does adaptation have? What are their implications?
- How are climate adaptation interventions justified? Who decides?
- Is climate adaptation an effective way of delivering climate justice?

1.2 Disposition

After this introduction-section, the thesis continues. It is structured in three main parts. This is to cleanly separate the case I present from the research design I develop, and the analysis I do when I combine them.

Part 1 argues that climate adaptation is the most future oriented of the pillars of the UNFCCC, and Chapter 2 argues that 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, while Chapter 3 argues that the two main strands of research in climate adaptation mirror their roots in development and decolonial studies.

Part 2 argues that discourse centralization is a key metric to understand the different world-views and their dominance in the discourse. Chapter 4 argues that the future is not a given destiny, but shaped by the decisions made and the worldview (and past-/future-view) that shapes them and Chapter 5 introduced the dominance index as a measure of the discourse centralization.

Part 3 argues that climate adaptation is a difficult, violent and ineffective way to deliver climate justice. Chapter 6 argues adaptation discourse shows remarkably high centralization,

with income level explaining more variance than geography and region and Chapter 7 argues the high concentration should be understood as a possible epistemicide.

Lastly, I conclude that the finessing of the UNFCCC works as a COP-out for countries in the global north to avoid cutting emissions. Serious climate mitigation seems like a much preferable alternative that avoids foreclosing any futures in the global south.

Part I

Climate adaptation

2 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 & 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 & 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 & 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 & 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 (CPI, 2023; Stern et al., 2022). 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.

2.1 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 & 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 & 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 et al., 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 et al., 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 & 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).

2.2 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 & 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 & 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 & 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 & 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 & 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 et al., 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 & 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 & 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.

2.3 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 & 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 & 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 & 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 & 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 & 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 & Hestbaek, 2016).

2.4 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 & 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 & 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 & 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 & 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 & 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 & 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.

3 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 environmental-ity (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).

3.1 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 (Chambers, 1994; Freire, 1970). 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 & 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 & 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 & 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 & 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.

3.2 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 & 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 & Mosse, 2006, p. 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 populations as exceptionally vulnerable, justifying interventions by external experts while often marginalizing local understandings of environmental change and appropriate responses (Scoville-Simonds et al., 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 & 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).

Part II

Research design

4 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 discourse operates at the intersection of multiple knowledge systems and worldviews, each with distinct assumptions about what constitutes valid knowledge, how vulnerability is understood, and what futures are possible or desirable. This chapter develops a theoretical framework for analyzing discourse centralization in climate adaptation, focusing on how certain epistemological and ontological positions dominate while others are marginalized.

The central theoretical tension explored here is between global discourses and diverse epistemological traditions. Climate adaptation represents a particularly revealing site for examining this tension because it necessarily involves negotiating between standardized global frameworks and diverse local realities. As international institutions, national governments, and local communities engage with adaptation challenges, they draw upon different knowledge systems, temporal frameworks, and understandings of human-environment relationships that may align or conflict with one another (Schipper, 2020). These knowledge networks and the domination is not necessarily visible.

The construction of “climate vulnerability” in adaptation discourse establishes particular relationships between actors, especially between the Global North and South. This discourse functions as a power technique that opens some future possibilities while foreclosing others. When adaptation is framed primarily as a technical problem rather than a political-economic condition, deeper questions about systemic causes of vulnerability are sidelined (Eriksen et al., 2021).

Drawing on interdisciplinary fields including development studies, future studies, science and technology studies, and political ecology, this theoretical framework provides an analytical lens for understanding the power dynamics at play in how adaptation is conceptualized and implemented across different contexts.

4.1 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 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.

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.

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.

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.

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 et al., 2020).

4.2 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 & 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 & 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).

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 interrogate 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 concept of “defuturing” developed by (Fry, 2019) helps us understand how dominant adaptation discourses can actively reduce rather than expand future possibilities. Defuturing occurs when particular ways of framing climate challenges and solutions foreclose alternative development pathways that might better address the intertwined challenges of climate change, inequality, and unsustainability. When adaptation is framed narrowly as adjusting to climate impacts within existing systems rather than transforming the systems that produce vulnerability, it limits the imagination of alternative futures.

For example, when coastal urban adaptation focuses primarily on protecting valuable real estate and infrastructure through seawalls and flood barriers, it may foreclose alternative approaches involving managed retreat, ecosystem restoration, or more fundamental reconsideration of urban-coastal relationships. Similarly, when agricultural adaptation emphasizes technological packages like drought-resistant crops and precision irrigation, it may foreclose alternative pathways involving agroecology, food sovereignty, or different land tenure arrangements (Taylor 2018?).

Adaptation discourse thus plays a crucial role in what (Goode & Godhe, 2017) term “anticipatory regime formation”—the processes through which particular ways of knowing and governing the future become institutionalized. Through policies, plans, funding mechanisms, and expert networks, certain approaches to adaptation become normalized while others are marginalized or rendered implausible. These anticipatory regimes shape not just how we respond to climate impacts but how we imagine and enact possible futures.

The concept of “capitalist realism” (Goode & Godhe, 2017) further illuminates how dominant adaptation discourse can constrain imagination of alternative futures. 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 defuturing in contemporary governance, where technical management of climate impacts displaces more transformative approaches that might address root causes of vulnerability.

Critical futures studies offers important insights for challenging these patterns of defuturing in adaptation discourse. By interrogating the assumptions, values, and power relations embedded in dominant future visions, critical futures approaches can open space for more diverse

and just adaptation pathways. This involves not just critiquing existing approaches but actively cultivating what (Cretney et al., 2024) calls “adaptive futures” that expand rather than constrain possibilities for responding to climate change.

4.3 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.

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 the theoretical perspectives discussed above, the concept of discourse centralization provides a framework for analyzing epistemological diversity in climate adaptation. Discourse centralization refers to the degree to which adaptation discourse reflects a single dominant perspective or accommodates multiple ways of knowing and being. High centralization indicates a homogeneous discourse dominated by particular epistemological and ontological assumptions, while low centralization indicates a more heterogeneous discourse that encompasses diverse perspectives (Inayatullah, 1990).

Discourse centralization operates through several interrelated mechanisms. First, knowledge authorization determines what counts as valid knowledge and who is recognized as a legitimate knowledge producer. In adaptation discourse, certain forms of expertise (particularly climate science, economics, and technical planning) are typically authorized as more credible and relevant than others (such as local, indigenous, or experiential knowledge). Second, problem

framing shapes how adaptation challenges are understood and what solutions seem appropriate. When adaptation is framed primarily as a technical problem, for example, it suggests technical solutions rather than political or social transformations.

Third, linguistic practices such as specialized terminology, standardized categories, and particular narrative structures can reinforce certain ways of knowing while excluding others. The language of climate models, vulnerability indices, and cost-benefit analysis, for example, may be inaccessible to many stakeholders and privilege certain kinds of knowledge over others. Fourth, institutional arrangements including funding mechanisms, governance structures, and professional incentives can systematically favor particular approaches to adaptation while marginalizing alternatives (Escobar, 1995).

These mechanisms of discourse centralization have significant implications for climate justice. When adaptation discourse is highly centralized around Northern epistemologies and ontologies, it may reproduce colonial power relations and marginalize the perspectives of those most vulnerable to climate impacts (Ireland & McKinnon, 2013). Conversely, more decentralized discourse that creates space for epistemological diversity may enable more just and effective approaches to adaptation that draw on multiple knowledge systems and center the needs and aspirations of affected communities.

The concept of discourse centralization provides a theoretical foundation for empirically analyzing patterns of homogeneity or diversity in adaptation discourse. Rather than assuming either complete homogeneity or radical diversity, this approach enables nuanced assessment of the degree to which adaptation discourse reflects epistemological plurality or monoculture across different contexts (**petersen2015?**). It also helps identify factors that may promote or inhibit epistemological diversity in adaptation governance, such as institutional structures, power relations, and historical legacies.

Scale is a central organizing principle in climate adaptation discourse, with “the local” and “the global” frequently positioned as distinct domains requiring different forms of knowledge and governance. However, critical geographers have long argued that scale is not a pre-given hierarchy but a social construction with significant political implications (**marston2000?**). How scale is constructed in adaptation discourse shapes who has authority to speak about adaptation needs, what kinds of knowledge are considered relevant, and how resources are allocated.

The global scale is constructed through international institutions like the UNFCCC, scientific bodies like the IPCC, and financial mechanisms like the Green Climate Fund. These institutions produce standardized categories, metrics, and approaches that enable comparison and coordination across diverse contexts. The global framing of climate change emphasizes its planetary nature, positioning it as a challenge that transcends national boundaries and requires coordinated international action. This framing has been crucial for building political momentum for climate action but can also abstract from the differentiated responsibilities and impacts that characterize climate change.

The local scale, in contrast, is constructed as the site of concrete impacts and interventions. Local knowledge, institutions, and practices are increasingly recognized as essential for effective adaptation. The local framing emphasizes context-specific vulnerabilities, capacities, and priorities that may not be visible from global perspectives. However, “the local” is not a neutral category but is often constructed in ways that align with particular political agendas, whether romanticizing local communities as inherently sustainable or representing them as lacking capacity and requiring external assistance (Mac Ginty, 2015).

Between these poles lie various intermediate scales, including the national, regional, and sectoral. Regional knowledge systems, institutions, and networks may create spaces for more context-sensitive approaches to adaptation while still enabling coordination across diverse local contexts. The regional scale may thus offer possibilities for balancing the standardization needed for global action with the diversity needed for local relevance.

The politics of scale in adaptation governance involve ongoing negotiations about where different kinds of decisions should be made and by whom. These negotiations are not merely technical questions of efficiency or subsidiarity but fundamentally political questions about authority, legitimacy, and accountability. When adaptation is framed as primarily a global challenge requiring expert-driven solutions, local communities may be positioned as passive recipients rather than active agents in adaptation processes. Conversely, when adaptation is framed as primarily a local responsibility, broader structural causes of vulnerability may be obscured, and communities may be left to address challenges that exceed their capacities without adequate support (Eriksen et al., 2021).

The degree of discourse centralization serves as an indicator of the dominance of what might be called the “anglobal discourse.” Low fragmentation (high centralization) suggests the dominance of particular ways of knowing and being, limiting the range of futures considered legitimate. Conversely, higher fragmentation would indicate greater epistemological and ontological plurality, potentially enabling a wider range of future possibilities. By empirically measuring discourse centralization across different dimensions, we can better understand the factors that shape adaptation discourse and the implications for just and effective adaptation.

5 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.

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.

5.1 Corpus Collection and Preparation

National Adaptation Plans provide a window into how countries conceptualize climate vulnerability and appropriate responses. To make these documents comparable, we developed a systematic approach to extract, clean, and prepare the text while preserving the ability to analyze patterns across different country groupings.

The analysis begins with the systematic collection of National Adaptation Plans from the UNFCCC’s NAP Central repository, which serves as the authoritative source for these policy documents (Mizuno & Okano, 2024). As of March 2025, this repository contained submissions from countries representing diverse geographic contexts, economic circumstances, and climate vulnerabilities. Our automated collection process identified and downloaded 47 English-language NAPs, representing a substantial portion of global adaptation planning efforts. 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 (Wright et al., 2023).

The temporal distribution of these documents spans from 2015 to 2025, capturing the evolution of adaptation planning as countries have developed their approaches to addressing climate vulnerability. This timeframe is particularly significant as it encompasses the period following the Cancun Adaptation Framework (2010), which formally established adaptation as a pillar of climate governance, through to the post-Paris Agreement era where adaptation has gained equal standing with mitigation in international climate policy.

To enable meaningful analysis across different country contexts, each document was enriched with standardized metadata drawn from World Bank country classifications and established

geographic categories. This process involved matching country names to ISO codes and incorporating income level classifications (low, lower-middle, upper-middle, and high income), regional groupings, and special geographic designations. Specifically, we identified 12 Small Island Developing States (SIDS) and 12 Landlocked Developing Countries (LLDCs) within our corpus. These categorizations are not merely descriptive labels but analytical dimensions that allow us to examine whether discourse patterns align more strongly with economic positioning, regional institutions, or shared geographic vulnerabilities.

The process of extracting text from PDF documents presented several technical challenges that required careful attention to preserve the integrity of the analysis. Government documents often contain complex formatting, tables, figures, and multilingual text that can introduce artifacts during extraction. Our extraction pipeline successfully converted 47 documents into analyzable text, with Tonga and Zimbabwe's plans removed from the corpus due to insufficient textual content after processing, leaving the analysis with 45 plans. The final corpus contains approximately 10 291 911 characters of text, providing a substantial foundation for discourse analysis.

Creating comparability across this diverse set of documents required systematic preprocessing that balanced standardization with preservation of meaningful content. The text cleaning process began with tokenization—breaking documents into individual words—followed by validation against a comprehensive English dictionary containing 122 553 terms. This validation step was crucial for removing formatting artifacts, acronyms, and non-English text that could skew the analysis. Importantly, we removed all country and city names from the corpus to prevent geographic references from dominating the discourse patterns. This ensures that similarities or differences between documents reflect how adaptation is conceptualized rather than which locations are mentioned (Silge & Robinson, 2017).

The preprocessing pipeline applied consistent rules across all documents: converting text to lowercase, removing punctuation and numbers, eliminating common English stopwords that carry little semantic meaning, and filtering out terms that appeared in fewer than 2 or more than 44 documents. This frequency filtering focuses the analysis on terms that are neither so rare as to be idiosyncratic nor so common as to be uninformative (M. E. Roberts et al., 2019). After these preprocessing steps, the corpus was reduced to 4855 unique terms.

This systematic approach to document preparation creates what can be understood as a “level playing field” for comparison. By removing country-specific references and standardizing the vocabulary, we ensure that any patterns identified in the subsequent analysis reflect genuine differences in how adaptation is conceptualized rather than superficial variations in terminology or geographic focus. The preprocessing choices—particularly the removal of geographic terms and the frequency thresholds—were designed to reveal the underlying structure of adaptation discourse while acknowledging that such standardization inevitably involves trade-offs between comparability and contextual richness.

The final prepared corpus of 45 documents, enriched with systematic metadata and processed to ensure comparability, provides the foundation for the structural topic modeling analysis that

follows. This careful preparation ensures that when we examine patterns of discourse centralization, we can be confident that these patterns reflect meaningful differences in how countries conceptualize climate adaptation rather than artifacts of data collection or processing.

5.2 Structural Topic Modeling

Structural topic modeling allows us to discover latent themes in how countries conceptualize adaptation while accounting for document metadata. This approach reveals patterns in discourse that might not be apparent from reading individual documents, enabling systematic comparison across our analytical categories.

Structural topic modeling (STM) provides a sophisticated approach to uncovering latent thematic patterns in large text corpora while simultaneously accounting for document-level metadata (M. E. Roberts et al., 2016). 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. 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 structural variant of topic modeling is particularly well-suited to our research questions because it allows document metadata—such as income level, region, and geographic characteristics—to influence topic prevalence (M. E. Roberts et al., 2019). This means we can examine not just what topics exist in the corpus, but how their prevalence varies across different types of countries. This capability is crucial for understanding whether low-income countries emphasize different aspects of adaptation compared to high-income countries, or whether Small Island Developing States frame adaptation differently than landlocked nations. The model treats documents as “bags of words,” meaning word order is not considered, but this simplification allows for computationally efficient discovery of thematic patterns across our 45 documents.

Determining the appropriate number of topics (k) represents a critical 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. We employed a data-driven approach to model selection, testing models with varying numbers of topics and evaluating them across multiple metrics. Semantic coherence measures how frequently the most probable words for a topic co-occur within documents, indicating whether topics capture meaningful themes. Exclusivity assesses how distinctive topics are from one another, ensuring we identify unique rather than overlapping concepts. Held-out likelihood evaluates the model’s ability to predict word usage in documents not used for training, providing a measure of generalizability (M. E. Roberts et al., 2019).

Our optimization process identified $k = 15$ as the optimal number of topics, providing sufficient granularity to capture meaningful variation in adaptation discourse while maintaining interpretable and distinct themes. This selection process involved balancing the statistical metrics with substantive considerations about what level of detail would be most useful for understanding patterns in adaptation planning. The model with 15 topics achieved strong performance on coherence (indicating interpretable topics) and exclusivity (indicating distinct themes) while avoiding the fragmentation that occurred with higher k values.

The specification of our structural topic model incorporated the metadata categories identified during document preparation, allowing us to examine how topic prevalence varies with income level, regional grouping, and special geographic designations. The model includes a prevalence formula that incorporates these covariates: income level (with 4 categories), region (with 6 groups), and geography (with 4). This specification enables the model to estimate not just the overall prevalence of each topic across the corpus, but how that prevalence shifts based on document characteristics.

The model was initialized using spectral decomposition, which provides more stable and reproducible results compared to random initialization. After 32 iterations, the model converged successfully, indicating that the algorithm had identified stable topic distributions. The quality of the final model is reflected in its ability to identify coherent topics that align with recognizable themes in adaptation planning while maintaining sufficient distinctiveness to capture the diversity of approaches across countries.

Topic interpretation in our analysis relies on examining the words most strongly associated with each topic through three complementary metrics. FREX (frequency-exclusivity) words balance how often a word appears in a topic with how exclusive it is to that topic, identifying terms that are both central and distinctive. High-probability words show the terms most likely to appear when a topic is discussed, regardless of their distinctiveness. Lift words identify terms that are most strongly associated with a topic compared to their baseline frequency in the corpus (M. E. Roberts et al., 2019). By examining these three word lists for each of our 15 topics, we can qualitatively interpret what aspects of adaptation each topic represents.

This word-based interpretation approach allows us to assign meaningful labels to the statistical constructs identified by the model. For example, a topic with FREX words including “assessment,” “vulnerability,” “index,” and “methodology” clearly relates to vulnerability assessment approaches, while a topic featuring “indigenous,” “traditional,” “community,” and “knowledge” indicates attention to local and traditional adaptation practices. This interpretation process, while necessarily involving qualitative judgment, is grounded in the statistical patterns identified by the model and provides the foundation for our subsequent analysis of how these topics are distributed across different country groupings.

5.3 Analysis

The Dominance Index quantifies how concentrated adaptation discourse is around a small number of topics, providing a measure of discourse centralization that can be compared across different country groupings. This novel application of concentration metrics to discourse analysis reveals patterns of epistemological diversity or homogeneity in how adaptation is conceptualized.

The Dominance Index operationalizes this concept by measuring what proportion of discourse is concentrated in the top three most prevalent topics for any given group of documents. The choice of three topics balances sensitivity to concentration with robustness to minor variations. If we examined only the single most prevalent topic, we might miss important patterns where discourse is dominated by a small cluster of related themes. Conversely, including too many topics would dilute the measure’s ability to detect meaningful concentration. Three topics typically capture the core themes while remaining sensitive to differences in concentration patterns.

The calculation proceeds at two complementary levels. At the document level, we measure how concentrated each individual NAP is by calculating what proportion of its content relates to its three most prevalent topics. A document where these three topics account for 60% of the content shows higher concentration than one where they account for only 30%. By averaging these document-level measures within country groupings, we obtain a measure of typical concentration. At the corpus level, we first calculate the average topic proportions across all documents in a group, then identify the three most prevalent topics for that group as a whole. This corpus-level measure reveals which specific topics dominate the collective discourse and how much of the overall discussion they represent.

To enable meaningful comparison across groups, the Dominance Index is normalized to a 0-1 scale. A value of 0 would indicate perfect uniformity where all topics are equally prevalent—though this theoretical minimum is never observed in practice. A value of 1 would indicate complete concentration where all discourse focuses on a single topic. The normalization accounts for the mathematical constraint that with 15 topics, the minimum possible concentration in the top three is 0.200. Values above 0.9 indicate very high centralization, while values below 0.6 would suggest relatively diverse discourse—though even our most diverse groups show higher concentration than this threshold.

Our comparative analysis examines how the Dominance Index varies across three analytical dimensions established during document preparation: income level, regional grouping, and special geographic designations (SIDS and LLDC status). For each dimension, we calculate dominance values for all relevant subgroups—for instance, comparing low, lower-middle, upper-middle, and high-income countries. These comparisons reveal whether discourse centralization follows economic gradients, regional patterns, or geographic vulnerabilities.

To understand which factors most strongly shape discourse patterns, we employ a variance decomposition approach that quantifies how much of the total variation in dominance values

can be attributed to each dimension. This approach, analogous to analysis of variance but applied to our discourse metrics, reveals the relative importance of different factors. If income level explains 40% of the variance while region explains only 10%, this suggests that economic positioning shapes adaptation discourse more strongly than regional institutional contexts. The variance explained is calculated by comparing how much dominance values differ between groups (for example, between income levels) relative to how much they vary within groups.

Statistical confidence in these patterns is assessed through resampling methods that generate confidence intervals around our dominance estimates. When confidence intervals for different groups do not overlap, we can be confident that the observed differences reflect meaningful patterns rather than random variation. This is particularly important given our sample size of 45 documents, where apparent differences might arise by chance, especially for smaller subgroups.

The patterns revealed through this analysis directly address our research questions about how adaptation discourse is structured and what factors shape its homogeneity or diversity. If we find that low-income countries show significantly higher dominance values than high-income countries, this would suggest that economic constraints translate into discursive constraints. If regional groupings explain substantial variance, this would point to the importance of regional institutions and knowledge networks in shaping how adaptation is understood. If geographic factors like being a small island state explain little variance despite the dramatic differences in climate vulnerability, this would suggest that adaptation discourse is shaped more by institutional and economic factors than by the specific nature of climate threats.

Part III

Analysis

6 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 the Dominance Index methodology to 45 National Adaptation Plans submitted to the UNFCCC. 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 model identifies the substantive themes that organize adaptation discourse, revealing which aspects of climate response receive attention and which remain marginal. The dominance analysis quantifies the degree of discourse concentration, showing how focused or diverse adaptation planning is both within individual documents and across country groupings. The variance decomposition examines which factors—regional, economic, or geographic—best explain the patterns observed in adaptation discourse.

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 both document and corpus levels. Document-level analysis shows how concentrated individual National Adaptation Plans are on their most prevalent topics, while corpus-level analysis reveals whether countries within particular groupings converge on similar themes or maintain diverse approaches. The analysis systematically examines these patterns across three dimensions: income levels ranging from low to high, regional groupings spanning six geographic areas, and special geographic designations for Small Island Developing States and Landlocked Developing Countries. 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, and geographic 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, or geographic vulnerabilities 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. The chapter prioritizes comprehensive presentation of results over selective emphasis, allowing the patterns to emerge through systematic analysis rather than predetermined focus.

6.1 Topic Identification

The structural topic model identified topics that capture how climate adaptation is conceptualized across National Adaptation Plans, providing the foundation for understanding patterns of discourse concentration and variation.

The process of identifying an optimal number of topics involved systematic testing across a range of model specifications, each offering different granularity in capturing adaptation discourse. Models were evaluated with k ranging from 10 to 40 topics in increments of 5, with each specification estimated until convergence. The evaluation process considered multiple metrics simultaneously: semantic coherence, which measures how frequently the high-probability words for each topic co-occur within documents; exclusivity, which captures how distinctive each topic's words are from other topics; and held-out likelihood, which assesses the model's ability to predict word usage in documents not used for estimation. Lower values of k (10-15 topics) produced broad thematic categories that, while coherent, obscured important distinctions—for instance, conflating all water-related adaptation into a single topic regardless of whether the focus was irrigation, flooding, or water quality. Higher values of k (30-40 topics) resulted in excessive fragmentation, splitting coherent themes like agricultural adaptation into narrow subtopics that appeared sporadically across documents.

The selected model with $k=15$ achieved a semantic coherence score of 0 and an exclusivity score of 8, representing the best balance among tested specifications. This model's coherence score indicates that the most probable words within each topic genuinely appear together in documents rather than being statistical artifacts. The exclusivity score confirms that topics capture distinct aspects of adaptation discourse rather than variations on the same theme. The combined optimization score of 0 exceeded all other specifications, providing quantitative support for this selection. Beyond these metrics, the 15-topic model produced themes that aligned with established categories in adaptation planning while revealing nuanced distinctions that might inform policy analysis.

ID	Topic Name	Prevalence (%)	Documents	Coverage (%)
2	Financ: ongo, strateg, output	16.2	19	42.2
5	Chapter: provinci, world, describ	11.2	11	24.4
14	Tourism: provinci, provinc, counti	7.9	15	33.3
9	Outcom: involv, term, short	7.3	9	20.0
4	Line: citi, territori, transit	6.9	8	17.8
6	Rangeland: mountain, initi, moham	6.7	8	17.8
13	Des: les, refuge, nutrit	6.7	5	11.1
7	Yet: nationwid, commenc, salin	6.6	8	17.8
15	Atol: pacif, outer, typhoon	6.3	7	15.6
1	Secretariat: director, cent, conduct	5.5	6	13.3
11	Feder: percentag, indic, hectar	4.3	6	13.3
12	Green: enhanc, perform, activ	4.2	4	8.9
3	Centuri: period, condit, valu	3.5	4	8.9
8	Author: task, defens, ministri	3.5	5	11.1
10	Strip: west, confid, ensembl	3.3	4	8.9

Table 6.1: Topic Prevalence Across All National Adaptation Plans

Topic	Label	FREX Terms (Frequent & Exclusive)
1	Secretariat: director, cent, conduct	secretariat, director, cent, conduct, unoffici, offic, money, member, translat, minim
2	Financ: ongo, strateg, output	financ, ongo, strateg, output, overarch, process, donor, linkag, elabor, within
3	Centuri: period, condit, valu	centuri, period, condit, valu, accord, grow, yes, hazard, precipit, deficit
4	Line: citi, territori, transit	line, citi, territori, transit, famili, indigen, instrument, perspect, view, nativ
5	Chapter: provinci, world, describ	chapter, provinci, world, describ, valid, nanc, arrang, nap, con, legal
6	Rangeland: mountain, initi, moham	rangeland, mountain, initi, moham, malaria, fluctuat, box, modern, desert, meter
7	Yet: nationwid, commenc, salin	yet, nationwid, commenc, salin, stress, surg, fisher, code, fisheri, disabl
8	Author: task, defens, ministri	author, task, defens, ministri, background, barrier, economi, regulatori, advocaci, million
9	Outcom: involv, term, short	outcom, involv, term, short, medium, municip, evalu, page, long, depart
10	Strip: west, confid, ensembl	strip, west, confid, ensembl, calcul, rainfal, perhap, score, might, trend

Topic	Label	FREX Terms (Frequent & Exclusive)
11	Feder: percentag, indic, hectar	feder, percentag, indic, hectar, propos, basin, percent, procedur, fund, river
12	Green: enhanc, perform, activ	green, enhanc, perform, activ, readi, collabor, offic, short, program, strateg
13	Des: les, refuge, nutrit	des, les, refuge, nutrit, main, percent, pour, host, lac, beneficiari
14	Tourism: provinci, provinc, counti	tourism, provinci, provinc, counti, forest, wildlif, livelihood, promot, mountain, local
15	Atol: pacif, outer, typhoon	atol, pacif, outer, typhoon, cyclon, retriev, tropic, pluvial, immedi, sea

Table 6.2: Topics Identified in National Adaptation Plans

The 15 topics identified through this process reveal both expected patterns and surprising emphases in global adaptation discourse. Sectoral topics constitute the largest category, with distinct topics emerging for water resources, agriculture, coastal zones, health systems, and infrastructure. The separation of these sectors into distinct topics rather than a general “sectoral adaptation” theme indicates that each sector has developed specialized vocabulary and concerns within adaptation planning. For instance, the water resources topic emphasizes basin-level management and irrigation infrastructure, while the coastal topic focuses on sea-level rise and storm protection. This sectoral differentiation suggests that adaptation planning often proceeds through established ministerial boundaries rather than integrated approaches.

Institutional and procedural topics emerge as a substantial component of adaptation discourse, occupying several of the 15 topics. These topics reveal the mechanisms through which adaptation moves from planning to implementation. The financial mechanisms topic encompasses not only funding amounts but the complex architecture of climate finance, including donor coordination, budget integration, and financial tracking systems. The governance topic focusing on subnational implementation highlights the multi-level nature of adaptation, with terms indicating vertical coordination from national to municipal levels. A separate topic on planning processes captures the procedural aspects of developing NAPs themselves, suggesting that the process of planning has become as important as the content of plans.

Topic prevalence across National Adaptation Plans

Other topics (10.3%)	Yet: nationwid, commenc, salin (6.6%)	Feder: percentag, indic, hectar (4.3%)	Green: enhanc, perform, activ (4.2%)
Chapter: provinci, world, describ (11.2%)	Des: les, refuge, nutrit (6.7%)	Atol: pacif, outer, typhoon (6.3%)	Secretariat: director, cent, conduct (5.5%)
Financ: ongo, strateg, output (16.2%)	Line: citi, territori, transit (6.9%)	Rangeland: mountain, initi, moham (6.7%)	
	Tourism: provinci, provinc, counti (7.9%)	Outcom: involv, term, short (7.3%)	

Geographic and hazard-specific topics reveal how physical geography shapes adaptation discourse, though perhaps not in expected ways. Rather than broad topics on “mountain adaptation” or “island adaptation,” the model identifies specific geographic contexts tied to particular challenges. The mountain and river basin topic links topography to water management, while the island topic specifically emphasizes atolls and outer islands, suggesting attention to the most vulnerable island contexts. The presence of a distinct topic on tropical cyclones and typhoons indicates that countries experiencing these hazards frame adaptation significantly differently from those focused on gradual changes like temperature increases or shifting precipitation patterns.

Examining which topics appear most and least frequently across the corpus provides insight into the priorities and gaps in global adaptation planning. The five most prevalent topics—Financ: ongo, strateg, output, Chapter: provinci, world, describ, Tourism: provinci, provinc, counti, Outcom: involv, term, short, Line: citi, territori, transit—collectively account for 49.5% of the total discourse. The dominance of financial and implementation topics among the most prevalent themes suggests that “how to adapt” receives as much or more attention than “what adaptation looks like.” This emphasis on process and mechanisms over substantive actions may reflect the influence of international guidelines and donor requirements in shaping NAP development.

Conversely, the least prevalent topics—Centuri: period, condit, valu, Author: task, defens, ministri, Strip: west, confid, ensembl—collectively represent only 10.3% of discourse. The marginal presence of topics related to indigenous knowledge, transformational change, or justice-oriented approaches suggests that alternative framings of adaptation remain periph-

eral to mainstream planning despite their prominence in academic and civil society discussions. This absence is particularly notable given the theoretical literature on adaptation that emphasizes the importance of local knowledge and transformative approaches.

The distribution of topics across documents reveals additional patterns in how adaptation discourse is structured. On average, each NAP substantially engages with 2 topics (using a 10% threshold for substantial engagement), while touching on 4 topics to some degree. This concentration suggests that most countries focus their adaptation planning on a core set of concerns while giving cursory attention to others. The most “universal” topics—those appearing in over 90% of documents—are 0 in number, primarily covering financial mechanisms and general planning processes. In contrast, 15 topics appear in fewer than half of all documents, indicating specialized concerns relevant only to specific contexts.

The statistical quality of individual topics varies in revealing ways. Topics with the highest semantic coherence scores tend to be those with technical vocabulary, such as climate modeling or vulnerability assessment, where specialized terms consistently co-occur. Topics with lower coherence often address cross-cutting issues like gender or participation, where vocabulary is more diffuse. Exclusivity scores are highest for geographically specific topics (atolls, mountains) and hazard-specific topics (cyclones), while lower for general planning and implementation topics that share vocabulary across themes. This pattern suggests that the model most clearly identifies discourse when it is technically specialized or geographically specific, while more integrated or holistic approaches to adaptation may be harder to capture as distinct topics.

6.2 Patterns of Discourse Centralization

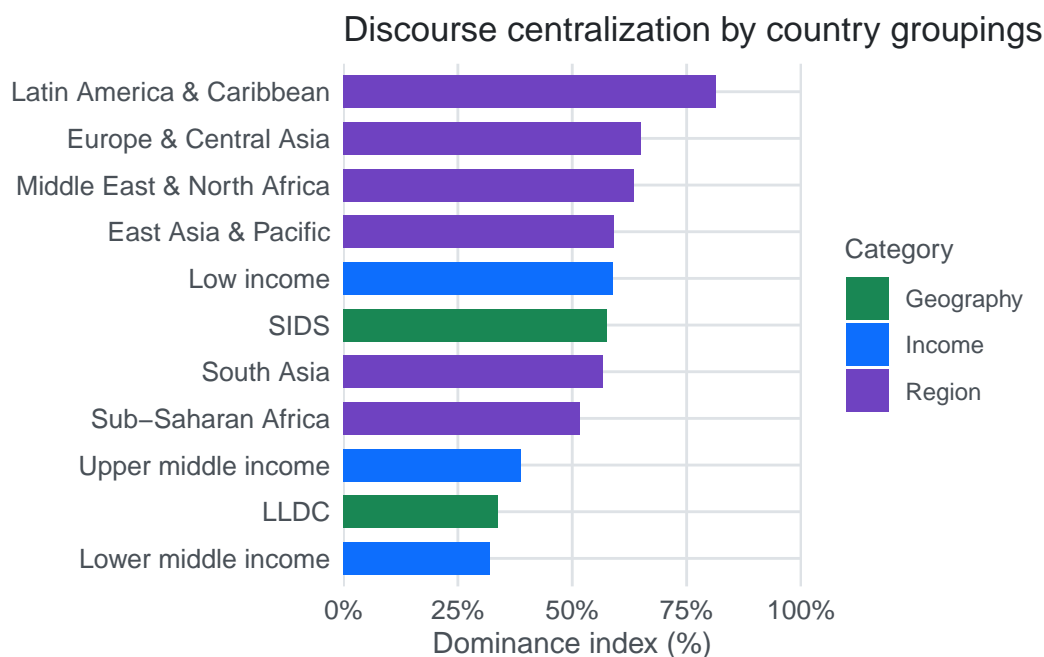
Analysis of discourse centralization reveals remarkably high concentration across all National Adaptation Plans, with both document-level and corpus-level patterns suggesting limited epistemological diversity in how climate adaptation is conceptualized globally.

The Dominance Index captures discourse centralization at two complementary levels, each revealing different aspects of how adaptation is conceptualized. Document-level dominance measures how concentrated each individual NAP is on its top three topics—a high value indicates that a country’s adaptation plan focuses heavily on a narrow set of themes rather than addressing adaptation comprehensively. Corpus-level dominance examines the collective discourse of a group of countries, measuring whether they converge on the same dominant topics or emphasize different aspects of adaptation. Together, these measures reveal both the internal coherence of individual plans and the degree of convergence across countries. Values approaching 1.0 indicate extreme concentration, while values closer to 0 would suggest more balanced attention across multiple topics—though such low values are not observed in our corpus.

The document-level findings present a striking picture of universal concentration. Across all 45 NAPs, the normalized dominance value is 90.7%, indicating that the typical adaptation plan devotes the vast majority of its content to just three topics out of the 15 identified. This pattern holds with remarkable consistency across different country groupings. Low-income countries show a document-level dominance of 90.8%, while high-income countries register 91.8%—a difference of less than 0 despite vastly different resources and institutional capacities. The uniformity extends across regional groupings, with values ranging only from 51.7% to 81.3%, and geographic categories showing similarly minimal variation.

This universal pattern of document-level concentration suggests that the structure of adaptation planning itself—shaped by international guidelines, funding requirements, and technical assistance—produces focused rather than comprehensive plans regardless of national context. The practical implication is that any given NAP reads as a deep dive into a small number of adaptation priorities rather than a broad survey of climate vulnerabilities and responses. Whether this focus reflects strategic prioritization or constraints on what can be included in adaptation planning remains an open question, but the pattern is unmistakable: adaptation plans are exercises in selective attention rather than comprehensive vulnerability assessment.

The corpus-level patterns reveal more nuanced differences in how countries converge or diverge in their adaptation priorities. Among income groups, a surprising U-shaped pattern emerges that challenges linear assumptions about development and discourse diversity. High-income countries show the highest corpus-level dominance at 58.5%, indicating strong convergence on similar topics—specifically Author: task, defens, ministri, Yet: nationwid, commenc, salin, Line: citi, territori, transit. However, with only four high-income countries in the sample (Israel, Kuwait, Trinidad and Tobago, and Uruguay), this finding must be interpreted cautiously. These countries span different regions and face different climate challenges, yet their adaptation discourse converges remarkably, potentially reflecting shared access to international expertise or similar institutional models.



Low-income countries display the second-highest corpus-level dominance at 58.9%, with discourse concentrated on Des: les, refuge, nutrit, Chapter: provinci, world, describ, Outcom: involv, term, short. This high centralization among low-income countries aligns with theoretical expectations about the constraining effects of international development frameworks on adaptation planning. The dominant topics emphasize process-oriented and finance-related themes, suggesting that low-income countries' adaptation discourse is significantly shaped by donor requirements and international guidelines. The limited epistemological space reflected in this high dominance value indicates that despite facing diverse climate challenges—from drought in African nations to sea-level rise in Pacific islands—low-income countries articulate adaptation through remarkably similar framings.

The middle-income countries present a markedly different pattern, with lower-middle income countries showing the lowest corpus-level dominance at 31.9% and upper-middle income countries at 38.8%. This greater diversity in middle-income countries' adaptation discourse suggests more epistemological space for varied approaches. Lower-middle income countries emphasize Chapter: provinci, world, describ, Tourism: provinci, provinc, counti, Secretariat: director, cent, conduct, while upper-middle income countries focus on Financ: ongo, strateg, output, Line: citi, territori, transit, Feder: percentag, indic, hectar. The different dominant topics and lower overall concentration indicate that middle-income countries may have greater autonomy in framing adaptation according to national priorities rather than international templates. This could reflect their intermediate position—less dependent on climate finance than low-income countries but not yet fully integrated into high-income knowledge networks.

Regional patterns in corpus-level dominance provide additional insight into the factors shap-

ing adaptation discourse. The highest regional concentration appears in Latin America & Caribbean at 81.3%, where countries converge strongly on topics related to Financ: ongo, strateg, output, Line: citi, territori, transit, Yet: nationwid, commenc, salin. This high concentration may reflect shared regional institutions, similar colonial histories, or common climate challenges. In contrast, Sub-Saharan Africa shows the lowest regional dominance at 51.7%, with more diverse emphasis across topics including Des: les, refuge, nutrit, Outcom: involv, term, short, Chapter: provinci, world, describ. This regional variation suggests that epistemic communities operating at the regional scale—through bodies like regional development banks, economic communities, or technical cooperation networks—play a significant role in shaping how adaptation is conceptualized.

The middle-range regional dominance values reveal interesting patterns of partial convergence. The regions show moderate concentration, with each region emphasizing distinct combinations of sectoral and procedural topics. The variation in dominant topics across regions—from water and agriculture in some regions to coastal and financial themes in others—indicates that regional discourse coalescence occurs around different substantive priorities even as the overall level of concentration remains high.

Geographic vulnerability categories reveal yet another pattern in discourse centralization. Small Island Developing States show a corpus-level dominance of 57.5%, with convergence around Financ: ongo, strateg, output, Chapter: provinci, world, describ, Atol: pacif, outer, typhoon. The presence of Pacific-specific and ocean-related topics among SIDS’ dominant themes appears logical given their shared vulnerabilities to sea-level rise and ocean changes. Landlocked Developing Countries display lower dominance at 33.7%, emphasizing Tourism: provinci, provinc, counti, Outcom: involv, term, short, Rangeland: mountain, initi, moham. The relatively low dominance values for both geographic categories—lower than most income and regional groupings—suggests that geographic vulnerability alone does not produce convergent adaptation discourse. Instead, countries facing similar physical challenges may still conceptualize adaptation differently based on other factors.

The variance patterns within each grouping provide additional insight into discourse dynamics. Document-level variance is consistently low across all categories, reinforcing the finding of universal concentration in individual NAPs. However, corpus-level variance tells a different story. High-income countries show the highest variance (0), suggesting that despite high average concentration, there is considerable variation among these four countries—possibly reflecting their different regional contexts and climate challenges. Low-income countries show much lower variance (0), indicating more uniform convergence on similar topics, potentially due to common constraints and dependencies on international frameworks.

Examining which specific topics dominate across different groupings reveals the substantive content of discourse convergence. Financial and procedural topics appear among the top three for multiple groupings, suggesting these themes form a common core of adaptation discourse globally. However, the specific combinations vary meaningfully. Low-income countries’ emphasis on chapters, descriptions, and processes alongside nutritional and refugee concerns

suggests a discourse shaped by both procedural requirements and humanitarian vulnerabilities. High-income countries' focus on marine and other themes indicates a different framing of adaptation. Middle-income countries show more varied patterns, with some emphasizing provincial and municipal implementation while others focus on sectoral themes like water and agriculture.

The overall pattern emerging from these dominance analyses is one of constrained epistemological space in climate adaptation planning. The uniformly high document-level concentration indicates that structural factors in how NAPs are conceived and developed lead to focused rather than comprehensive plans. The varying corpus-level patterns suggest that while all countries produce concentrated documents, they concentrate on different aspects based primarily on their economic positioning and regional contexts. The U-shaped relationship with income—highest dominance at both extremes—challenges simple narratives about development and discursive autonomy. Instead, it suggests that different types of constraints operate at different income levels: international dependency for low-income countries and perhaps technocratic convergence for high-income countries, with middle-income countries occupying a space of relatively greater discursive freedom. These patterns set the stage for examining which factors best explain the limited variation that does exist in global adaptation discourse.

6.3 Factors Shaping Discourse Variation

While adaptation discourse shows high centralization overall, examining which factors explain the variation that does exist reveals that regional and economic positioning shape discourse patterns far more than the physical geography of climate vulnerability.

Understanding which factors drive the variation in adaptation discourse requires decomposing the differences we observe into their constituent sources. Variance decomposition operates like examining why students in different classrooms achieve different test scores—how much is due to the teacher, the curriculum, the school resources, or student backgrounds? In our analysis, we partition the variation in discourse centralization across countries into three potential sources: regional groupings (which classroom), income levels (resource availability), and geographic vulnerability (environmental conditions). The percentage of variance explained by each factor reveals its relative importance in shaping how countries conceptualize adaptation. If regional groupings explain 20.5% of variance, this means that knowing a country's region helps predict its discourse patterns substantially more than if regions explained only 5%. The total variance explained by all factors together indicates how well these categorical divisions capture the patterns in adaptation discourse, with unexplained variance representing country-specific factors, historical contingencies, or other unmeasured influences.

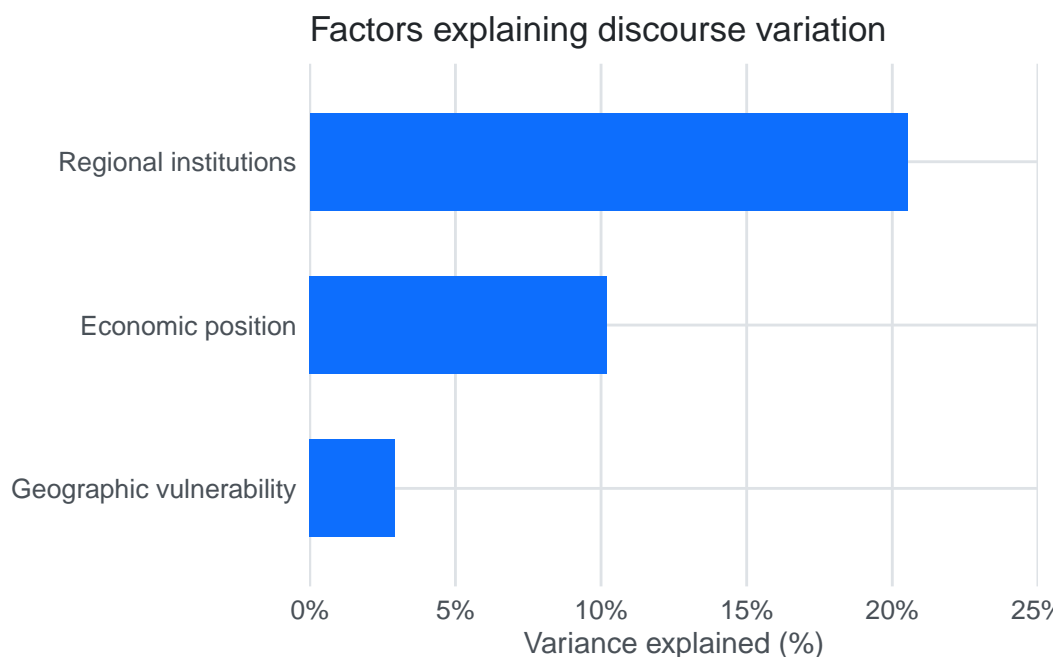
The analysis reveals a clear hierarchy among factors shaping adaptation discourse, with region emerging as the dominant influence at 20.5% of variance explained. This regional effect

substantially exceeds both income (10.2%) and geography (2.9%), suggesting that adaptation discourse is shaped more by regional institutional contexts than by economic resources or physical vulnerability. Together, these three factors explain approximately 33.6% of the variation in discourse centralization, leaving 66.4% attributable to country-specific factors or unmeasured variables. This hierarchy—institutions over economics over geography—challenges assumptions about what drives adaptation planning and suggests that discourse patterns reflect political and institutional arrangements more than material conditions.

The regional effect's dominance in explaining discourse variation reveals the powerful role of regional institutions, networks, and shared histories in shaping adaptation planning. The 20.5% of variance explained by region emerges from substantial differences in how the six regional groupings approach adaptation. Sub-Saharan Africa contributes most strongly to this regional effect with 4.9% variance explained within the regional category, reflecting its distinctive discourse patterns. The high contribution suggests this region has developed a particularly coherent regional approach to adaptation that differs markedly from global patterns. Conversely, East Asia & Pacific shows the lowest contribution at 3.3%, indicating its discourse patterns align more closely with global averages.

The mechanisms through which regional groupings shape discourse likely operate through multiple channels. Regional development banks—such as the Asian Development Bank, African Development Bank, and Inter-American Development Bank—provide not only funding but technical assistance and knowledge products that promote particular framings of adaptation. Regional economic communities like ASEAN, ECOWAS, and CARICOM facilitate policy learning and convergence among member states. Shared colonial histories within regions may also create common institutional structures and languages that influence how adaptation is conceptualized. The strength of the regional effect suggests these mechanisms successfully create distinctive regional “styles” of adaptation planning that transcend national boundaries. However, whether regional convergence represents beneficial knowledge sharing or problematic homogenization depends on whether regional approaches are well-suited to member countries' specific contexts.

The income effect, while secondary to region, still explains a substantial 10.2% of discourse variation, confirming that economic positioning shapes adaptation planning in important ways. Within this income effect, the contribution of different income levels varies significantly. Low income contributes 3.8% to the income effect, while High income contributes 2.9%. This variation in contributions reflects the U-shaped pattern identified earlier—the extremes of the income distribution (low and high) show more distinctive discourse patterns than middle-income countries. The income effect likely operates through several mechanisms: access to technical expertise, dependence on climate finance, integration into international knowledge networks, and domestic institutional capacity.



The relatively lower contribution of middle-income countries to income-based variance aligns with their greater discourse diversity identified in the dominance analysis. These countries appear to occupy a “sweet spot” where they have sufficient autonomy to develop nationally-specific approaches but remain diverse enough as a group to avoid convergence on common patterns. Low-income countries’ higher contribution to variance reflects their convergence on finance and process-oriented topics, driven by common dependencies on international support. High-income countries’ contribution, while based on a small sample, suggests a different form of convergence, possibly around technical sophistication or security framings. The income effect thus captures not a linear relationship between resources and discourse but different forms of constraint and convergence operating at different economic levels.

The surprisingly minimal geographic effect—explaining only 2.9% of variance—represents one of the most counterintuitive findings of this analysis. Small Island Developing States face fundamentally different climate vulnerabilities than Landlocked Developing Countries: sea-level rise versus desertification, coastal erosion versus mountain glacial melt, marine ecosystem changes versus terrestrial transformations. Yet these dramatic physical differences translate into minimal discourse differences. SIDS contribute 3.4% to the geographic effect, while LLDCs contribute 2.5%. Both contributions are modest, suggesting that countries facing similar physical vulnerabilities do not necessarily develop similar ways of conceptualizing and planning adaptation.

This geographic non-effect challenges fundamental assumptions about climate adaptation planning. If adaptation is primarily about responding to physical climate impacts, we would expect countries facing similar impacts to develop similar responses and discourse. The minimal vari-

ance explained by geography suggests instead that adaptation planning is shaped more by institutional templates, available resources, and regional knowledge networks than by the specific nature of climate vulnerabilities. A drought-prone landlocked country may have more in common discursively with its coastal regional neighbors than with other drought-prone nations globally. This pattern raises questions about whether current adaptation planning adequately responds to specific vulnerabilities or primarily reproduces institutional and regional templates regardless of physical context.

The hierarchy of effects—regional institutional (20.5%) > economic positioning (10.2%) > geographic vulnerability (2.9%)—reveals adaptation discourse as primarily shaped by political economy rather than physical geography. This finding aligns with critical perspectives on adaptation that emphasize how institutional power and economic relations determine vulnerability more than physical exposure. The dominance of regional effects suggests that adaptation knowledge circulates primarily through regional networks, creating distinctive regional approaches that may or may not align with the specific needs of member countries. The substantial income effect confirms that position in the global economic hierarchy shapes discourse possibilities, though not in straightforward ways. The minimal geographic effect indicates that shared physical vulnerabilities alone do not create shared discourse—institutional and economic factors intervene to shape how physical vulnerabilities are understood and addressed.

The approximately 66.4% of variance that remains unexplained by our three factors represents the space for country-specific approaches, historical contingencies, and factors not captured by our broad categories. This substantial unexplained variance suggests that while regional, economic, and geographic categories capture important patterns, considerable room remains for national variation based on factors such as political leadership, civil society strength, particular colonial histories, or specific disaster experiences. Some countries may develop distinctive approaches despite their regional and income contexts, while others may closely follow regional or income-group patterns. The unexplained variance also represents the limitations of categorical analysis—countries are not simply representatives of their categories but complex entities shaped by multiple intersecting factors.

Several important caveats temper these variance decomposition findings. The small sample size in some categories—particularly the four high-income countries—means their contribution to variance may be unstable. The analysis treats the three factors as independent, but in reality, they interact: regional groupings correlate partially with income levels, and geography influences both. For instance, many SIDS are also lower-income and concentrated in specific regions, making it difficult to fully separate these effects. Additionally, the variance decomposition captures only linear relationships between categories and discourse patterns, potentially missing non-linear dynamics or threshold effects. Despite these limitations, the clear hierarchy of effects and the minimal role of geography in shaping discourse patterns represent robust findings with important implications for understanding adaptation planning.

These variance patterns reveal adaptation discourse as shaped primarily by institutional and economic factors rather than the physical realities of climate vulnerability. The dominance of regional effects points to the powerful role of regional organizations and networks in creating

distinctive approaches to adaptation—whether these approaches serve member countries well deserves further scrutiny. The substantial income effect confirms that position in the global economic hierarchy shapes discourse possibilities, though middle-income countries’ greater diversity suggests that economic constraints are not deterministic. Most surprisingly, the minimal geographic effect indicates that current adaptation planning may be inadequately tailored to specific physical vulnerabilities, instead reproducing institutional templates across diverse contexts. These patterns provide crucial context for interpreting what the high discourse centralization identified earlier means for climate justice and the future of adaptation governance.

7 Discussion

The main findings indicates that climate adaptations main organizing principles are non-climate related. I argue that 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 income level emerging as the primary explanatory factor for what variation does exist. This brings us closer to understanding how climate adaptation actually works in the real world, rather than as just a part of the UN-FCCC negotiations.

The patterns provide empirical evidence for adaptation regime critiques that argue that adaptation functions as a regime that constructs vulnerability in particular ways while foreclosing alternative understandings and approaches. The following sections explore three key implications of these findings: how adaptation discourse constructs climate vulnerability, how this anticipatory governance functions as an anti-politics machine, and possibilities for better approaches to adaptation.

7.1 Adaptation and vulnerability

Adaptation discourse constructs rather than responds to climate vulnerability, paralleling how development discourse produces underdevelopment as its necessary counterpart.

The findings suggest that vulnerability construction occurs not only through direct claims about who or what is vulnerable, but through more subtle discursive processes that shape what counts as valid knowledge about vulnerability, who is authorized to produce that knowledge, and what interventions are considered reasonable responses. The remarkable consistency of discourse across diverse contexts indicates that these processes operate at a global scale, with powerful institutional actors including multilateral development banks, donor agencies, and scientific bodies shaping how vulnerability is understood and addressed.

The construction of climate vulnerability through adaptation discourse has material consequences for how resources are allocated and interventions designed. When vulnerability is primarily understood through economic frameworks, adaptation resources flow toward approaches that align with existing development paradigms rather than potentially transformative alternatives (Eriksen et al., 2021). This reinforces existing power relations and may exacerbate rather than reduce vulnerability in the most marginalized communities.

The high centralization of adaptation discourse around income-based patterns reveals how vulnerability is not simply an objective condition that adaptation responds to, but an actively constructed category that emerges through discourse and practice. This parallels Escobar (1995) argument that development discourse did not simply address pre-existing underdevelopment but actively produced “the Third World” as its necessary counterpart through particular knowledge practices, institutional arrangements, and power relations.

The finding that adaptation discourse clusters more strongly by income level than by geography suggests that vulnerability is conceptualized primarily in economic terms, with countries positioned similarly in the global economic system conceptualizing adaptation in similar ways despite facing different climate hazards. This economic framing of vulnerability aligns with mainstream development discourse that positions economic growth and market integration as universal solutions regardless of context (Ferguson, 1994).

The particularly high centralization (0.980) and low internal variation (0.018) among low-income countries suggests stronger constraints on their discursive autonomy in adaptation planning. This pattern indicates what Paprocki (2018) describes as “anticipatory ruination,” where certain places are constructed as inherently vulnerable and therefore requiring particular kinds of interventions. The discourse of inevitable climate catastrophe in low-income countries creates conditions where almost any intervention can be justified as necessary adaptation, regardless of its actual effects on vulnerability.

These patterns of differential vulnerability construction reflect what Santos (2016) describes as “epistemicide”—the systematic exclusion of non-Western knowledge systems from legitimate discourse. The high centralization of adaptation discourse suggests limited space for alternative conceptualizations of vulnerability rooted in indigenous knowledge, local experience, or non-Western ontologies.

7.2 The anti-politics of adaptation

Adaptation governance functions as an anti-politics machine that transforms fundamentally political questions about climate justice into technical problems, depoliticizing vulnerability while expanding bureaucratic power across governance scales.

The high centralization of adaptation discourse hints at what Ferguson (1994) termed the “anti-politics machine” operating in climate adaptation governance. The anti-politics machine transforms fundamentally political questions about power, justice, and distribution into technical problems amenable to expert solutions, depoliticizing vulnerability while simultaneously expanding bureaucratic power across multiple governance scales.

The dominance of particular topics across NAPs—vulnerability assessment, climate modeling, project management frameworks, monitoring and evaluation systems—reflects what Ferguson (1994) describes as “rendering technical,” where complex political-economic realities are translated into technical problems requiring technocratic interventions. This technical rendering makes climate adaptation governable through particular institutional arrangements but simultaneously limits the scope of what counts as legitimate adaptation action.

The finding that income level explains more variance than geographical factors directly supports the argument that development interventions (including adaptation) often have less to do with their stated objectives, than with the form of intervention. The similarity of discourse across countries with different climate vulnerabilities but similar income levels suggests that adaptation planning may be shaped more by institutional imperatives and funding requirements than by context-specific needs.

Regional patterns in discourse centralization suggest that the anti-politics machine operates across multiple scales, with regional bodies mediating between global frameworks and national implementation. The finding that regional groupings explain substantial variance indicates that regional institutions play an important role in translating global adaptation frameworks into context-specific approaches. However, the still-high centralization within regions suggests that these institutions often reproduce rather than challenge the depoliticizing tendencies of global adaptation discourse.

The institutionalization of adaptation through NAPs themselves represents a form of anti-politics, creating standardized planning frameworks that privilege certain forms of knowledge and expertise while marginalizing others. The UNFCCC guidelines for NAP development, technical assistance from international organizations, and funding criteria all shape what counts as legitimate adaptation planning, potentially constraining the autonomy of national governments and communities in determining their own adaptation priorities (Mizuno & Okano, 2024).

However, the variation that does exist across the corpus suggests that the anti-politics of adaptation is neither absolute nor uncontested. The lower centralization in some regions and income groups indicates spaces where alternative framings and approaches might emerge, even within the constraints of global adaptation governance. These variations point to what Scott calls “weapons of the weak”—subtle forms of resistance that operate within dominant systems while creating space for alternative possibilities (Ferguson, 1994).

7.3 Toward Pluriversal Adaptation

The empirical evidence of high discourse centralization calls for pluriversal approaches to adaptation governance that create space for diverse epistemologies while still enabling coordination necessary for effective climate action.

The findings on discourse centralization present both a challenge and an opportunity for reimagining adaptation governance. The challenge lies in the current homogeneity of adaptation discourse, which limits the range of approaches considered legitimate and marginalizes alternative knowledge systems that might offer valuable insights for addressing climate vulnerability. The opportunity lies in identifying pathways toward more epistemologically diverse approaches that Escobar (2018) describes as “pluriversal”—creating space for multiple ways of knowing and being while still enabling the coordination necessary for effective climate action.

The concept of a pluriversal approach to adaptation resonates with Santos (2016) call for an “ecology of knowledges” that recognizes the partial and situated nature of all knowledge systems and seeks productive dialogue between them. Rather than privileging scientific and technical knowledge as inherently superior, an ecology of knowledges would recognize the value of other knowledge in understanding and addressing climate vulnerability. The finding that geographical factors explain relatively little variance in current adaptation discourse suggests significant untapped potential for approaches that more fully engage with place-based knowledge systems, amongst others.

The lower centralization in regions like East Asia and Pacific (0.924) and Latin America and Caribbean (0.941) suggests these regions may already be incorporating somewhat more diverse approaches than the global average. Examining the specific discursive practices and institutional arrangements in these contexts might offer insights into how greater epistemological diversity could be fostered within adaptation governance more broadly.

A pluriversal approach to adaptation would require fundamental changes in how adaptation is governed, financed, and implemented. Current institutional arrangements—including the NAP process itself—often incentivize standardization rather than diversity, with funding mechanisms and technical assistance structured around particular conceptions of what constitutes legitimate adaptation. Reforming these arrangements to create space for diverse epistemologies would involve rethinking how adaptation is defined, valued, and evaluated across governance scales (Ireland & McKinnon, 2013).

Indigenous and traditional knowledge systems offer particularly important resources for pluriversal adaptation, providing alternative conceptualizations of human-environment relationships and approaches to navigating environmental change. While these knowledge systems are increasingly acknowledged in adaptation discourse, they are typically treated as sources of data to be incorporated into dominant frameworks rather than as alternative epistemological systems that might fundamentally challenge those frameworks. A genuinely pluriversal approach would engage with indigenous knowledge on its own terms, recognizing its distinct ontological and epistemological foundations (Escobar, 2020).

Community-based adaptation represents another potential pathway toward greater epistemological diversity, creating space for local knowledge and priorities in adaptation planning and implementation. However, as Ireland & McKinnon (2013) argue, community-based approaches often remain constrained by broader institutional frameworks that determine what counts as legitimate adaptation. A pluriversal approach would require challenging these constraints to create genuine space for community-defined adaptation pathways.

Regional institutions could play a crucial role in fostering pluriversal adaptation, mediating between global frameworks and local implementation in ways that create space for context-specific approaches. The finding that regional groupings explain significant variance in discourse centralization suggests that regional bodies already influence how adaptation is conceptualized and implemented. Strengthening regional institutions that are more responsive to local contexts and knowledge systems could help create pathways toward greater epistemological diversity within adaptation governance.

Crucially, a pluriversal approach to adaptation does not mean abandoning coordination or coherence in climate action. Rather, it means reimagining how that coordination happens—moving from standardization that privileges particular knowledge systems toward dialogical approaches that enable conversation across different ways of knowing and being. This aligns with what Escobar (Escobar, 2018) describes as “autonomous design,” where communities design their own transitions based on their specific contexts, histories, and aspirations, while still engaging with broader networks of knowledge and practice.

The high discourse centralization documented in this research represents not just a problem to be solved but an opportunity to reimagine adaptation governance in ways that better serve diverse communities facing climate impacts. By challenging the current homogeneity of adaptation discourse and creating space for epistemological diversity, pluriversal approaches to adaptation could enable more just and effective responses to climate vulnerability across contexts.

After all, the simplest way for the global north to avoid foreclosing futures in the global south, would be to reduce the carbon emissions and shifting the focus to climate mitigation pillar. Remembering the climate damage flowchart from earlier **?@fig-dmg_flow**, cutting off the emissions at the top by phasing out extraction of hydrocarbon and the burning of them, in line with their commitments.

```
``{r}
#| fig-cap: "Climate finance vs. fossil fuel finance"
#| label: fig-fuel_finance

# This is a placeholder for the actual visualization
# The actual implementation would take data from CPI and show
# the amount of fossil fuel finance still ongoing

``
```

And all this said, this is no reason to quit aid, but to view it is as one of many ways the global north and south interact.

8 Conclusion

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