

THE PENNSYLVANIA STATE UNIVERSITY
SCHREYER HONORS COLLEGE

DEPARTMENT OF GEOSCIENCES

The Future of Climate Change is in the hands of Climate Action Plans:
An Examination of the Purpose, Progress, and Structure of Climate Action Plans.

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FALL 2024

A thesis
submitted in partial fulfillment
of the requirements
for baccalaureate degrees
in Earth Science and Policy and Energy Engineering
with honors in Earth Science and Policy

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ABSTRACT

In working to address their party's NDC commitments, several countries have taken to developing climate action plans (CAPs). Developed at various levels of government, climate action planning takes on a life of its own as it reflects the needs, culture, and political landscape of the community it applies to, which requires a necessary level of variability amongst plans. Due to the noted global proliferation of climate action plans produced by varied levels of governments, a question was raised regarding the presence of a uniform development framework for climate action plans. The importance of pursuing this question is supported by the determination of an absence of an agreed-upon suite of elements outside of greenhouse gas emission inventories and goals for emissions reduction. In addition to this subject, questions arose regarding the geospatial variation of elements inclusion and the role of community engagement in plans' development.

It is proposed that climate action plans, particularly when involving significant community engagement, are an effective method for addressing subnational contributions as well as implementing local climate adaptation and mitigation strategies. After reviewing twenty-two climate action plans originating from across five continental regions, a suite of commonly included elements was identified based on continental region and governance scale. Subsequently, this thesis advocates for the utilization of these elements by governments and planners when undertaking the planning process. In particular, the role of community engagement was found to be a somewhat lacking element in climate action plans that has led to the perpetuation of systemic inequities. To explore this reality more thoroughly, research on the common best practices for community engagement and first-person interviews with both Māori and Pākehā members in Aotearoa were conducted. This thesis concludes that equitable community engagement is critical to achieving sustainable development through the creation of climate action plans.

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E aku manu taki, e aku manu taikō i rere mai i te tāepaepatanga o te rangi tēnā koutou katoa
To my esteemed leaders and esteemed elders who have flown from the very edge of the skies, I greet you all.

Ko te mihi tuatahi ki a Ranganui, e tū ihu nei, rāua ko Papatūānuku, e takoto nei, me ā rāua tamariki, a rāua mokpuna anō hoki. Tēnā koutou, tēnā koutou, tēnā koutou katoa.
First, I acknowledge Ranganui who stands over us all and Papatuanuku who lies below us and their children and grandchildren. I greet you all.

E te tini a te kura kua haere ki raro ki Te Reinga, hāere, whakangaro atu rā.
To the treasured ones who have gone on to Te Reinga (the underworld), go to the beyond.

Te hunga mate ki te hunga mate, Apiti hono, tatai hono
 Te hunga ora ki te hunga ora, Apiti hono, tatai hono
The dead to the dead, the living to the living, may the connections join and continue.

Hoki mai ki ngā hunga ora, tēnā koutou, tēnā koutou, tēnā koutou katoa
So, returning to the living, I greet you.

Ka mihi ahau ki ngā tangata whenua o Aotearoa. E ngā waka whakatekateka i te ia o te wai, koutou kua whakakukū mai nei ki tēnei tauranga tēnā koutou katoa. Ko Tanemahuta whakapiripiri koe, nō reira, tū tonu, tū tonu, ake tonu atu.
I acknowledge the indigenous people of Aotearoa. To the esteemed ancestors who have crossed the waters, you who have gathered here at this landing place, I greet you all. You are like Tanemahuta (the god of the forest), standing tall and strong; continue to do so for eternity.

Ki te iwi o Te Rarawa, ōku mihi nunui. I tiritiria e koutou tō mōhiotanga i a au, ā, i akonoa e au i a koutou. He koha matapopore me he kuru pounamu!
To the iwi of Te Rarawa, many greetings. You shared your knowledge with me, and I learned from you all. It is a highly treasured gift like a prized piece of greenstone.

Ka huri āku mihi ki tōku whānau Aotearoa. Ka mahi tahi tātou i te haerenga uaua engari he haerenga whakaihiihi anō hoki. Ko tōku tumanako ki te haere tonu tātou mahi ā muri ake nei.
Turning to my NZ family. In our work together, we are making a difficult but important journey. I hope that we will continue our work together in the future.

Ko Rocco, ko Audrey, rātou ko Paul, tōku whānau me aku pōhoi turua. E kore nei e mimiti te aroha mō koutou. Ōku mihi nunui i ō koutou awhina i tēnei haerenga. Tēnā koutou, tēnā koutou, tēnā koutou katoa.
To Rocco, Audrey and Paul, my family and my treasured adornment (trans: albatross ear-ring). My love for you is endless. My thanks for your support on this journey.

Manaaki whenua, manaaki tangata, haere whakamua!
Care for the land, care for the people, we move forward!

ACKNOWLEDGEMENTS

As a lifetime resident of Pennsylvania located on the original homeland of the Lenape, I want to recognize the First Nations people who were the original caretakers of this land. Due to Pennsylvania's history being grounded in the removal and erasure of Indigenous peoples, this body of work acknowledges First Nation peoples and their commitment to stewardship. In collaboration with the Indigenous Peoples Student Association and Indigenous Faculty and Staff Alliance, the Pennsylvania State University Land Acknowledgement was developed in 2021. It reads:

“The Pennsylvania State University campuses are located on the original homelands of the Erie, Haudenosaunee (Seneca, Cayuga, Onondaga, Oneida, Mohawk and Tuscarora), Lenape (Delaware Nation, Delaware Tribe, Stockbridge-Munsee), Monongahela, Shawnee (Absentee, Eastern, and Oklahoma), Susquehannock, and Wahzhazhe (Osage) Nations. As a land grant Institution, we acknowledge and honor the traditional caretakers of these lands and strive to understand and model their responsible stewardship. We also acknowledge the longer history of these lands and our place in that history.

Next, I want to acknowledge international indigenous stewardship, specifically the Māori community in Aotearoa. Thank you for the guidance, kindness, and leadership you showed me during my visit to your home as I strived to learn more about climate action planning and community engagement. Particularly, I want to thank Dion Pou for spending the time to teach us, despite it being such a shot in the dark at the beginning. Indigenous relations with the land and natural environment are one of the most developed and should be acknowledged as such. Indigenous peoples must be invited to and supported in joining planning relating to climate change.

Next, I want to acknowledge the faculty and staff who have shaped my thesis experience. To my whānau, George (Dr. Perry), James (Dr. Brock), Dion, Cameron, Elizabeth, Kareen, Erica (Dr. Smithwick), Brandi, Casey, and Peter (Dr. Buck), thank you for not only bringing me along as the only undergrad, but also reigniting my passion for education. It is because of you all that I will be pursuing my Ph.D. next fall. To Dr. Feineman, thank you for your unrelenting support in everything I did while at Penn State. You helped me not only find my way through scheduling classes and meeting honors requirements but also by guiding me toward my dream fields. Finally, I want to thank Dr. Peter Buck, once again. Despite our slightly rocky start, you have become one of my biggest role models and my motivator to continuously pursue just development, as you truly believe it can be achieved. Thank you for giving me the chance all those semesters ago.

Of course, I want to thank my family and friends. Aaleyah and Aditya, thank you for always spending way too much time in the library with me as I worked to finish my, seemingly infinite, assignments. Garrett, thank you for helping me to stay on track with this thesis during our thesis writing “parties”. Bella, you know as well as I do that I will never be able to thank you enough, but thank you for always supporting me, which includes always listening to my never-ending rambles. Kyle, thank you for always understanding my dreams and pushing me to chase each one of them, as you hold my hand. Finally, I want to thank my family. Mom, Pop, and Paul, thank you for supporting me as I chose to pursue my passion. Thank you for every Sunday dinner call, support over a bad test score, listening to drama, and everything in between. I love you all.

Finally, I want to thank those who currently advocate for a just world in all that they do. This world is ours- let’s save it together

Chapter 1

Introduction

Over the past two centuries, anthropogenic activities and resultant greenhouse gas emissions have led to a rapid alteration of the global climate.¹ Since the start of the Industrial Revolution, the global surface temperature has risen 1.1°C (approximately 2°F) as a result of what the Intergovernmental Panel on Climate Change (IPCC) defines with high confidence as “unsustainable energy use, land use and land-use change, lifestyles and patterns of consumption and production across regions, between and within countries.”¹ Subsequent climatic and environmental changes to the atmosphere, oceans, cryo- and bio-sphere, and weather extremes, have led to a substantial influx of negative results, with a higher proportion of impacts affecting vulnerable and significantly less-responsible regions and communities.¹ Subject to the further alteration of the global climate, such losses and hazards have been accepted to be exacerbated in the near future, thus causing greater damage.¹ With the upper limit of acceptable warming recently re-defined as 1.5°C, humanity is currently on track to cross this threshold by the end of the century. Although salvageable at 1.5°C via rapid and extreme measures, the global climate will reach an irreversible tipping point if planetary temperature rise reaches 2°C.¹ Being expressed to state the gravity of the situation any clearer, the IPCC has stated the following:

“Climate change is a threat to human well-being and planetary health. There is a rapidly closing window of opportunity to secure a livable and sustainable future for all. Climate resilient development integrates adaptation and mitigation to advance sustainable development for all, and is enabled by increased international cooperation including

improved access to adequate financial resources, particularly for vulnerable regions, sectors and groups, and inclusive governance and coordinated policies. The choices and actions implemented in this decade will have impacts now and for thousands of years.”

As the reality of anthropogenic behaviors’ impacts became apparent starting the 1970s, leading convenings such as the 1983 Brundtland Commission, which was the first to define “sustainable development”, and the 1992 Rio Earth Summit, which established the United Nations Framework Convention on Climate Change (UNFCCC), brought attention to the issue on the world stage.² As a result, climate action planning blossomed towards the end of 1990s, and was further pursued by regional actions, such as the Conference of New England Governors and Eastern Canadian Premiers Climate Action Plan in 2001 and the U.S. Conference of Mayors’ Climate Protection Agreement of 2005.^{2,3} Fast forward to the second decade of the twenty-first century, global leaders, guided by the UNFCCC, made history through their participation in the monumental Paris Agreement at the 21st Conference of the Parties (COP).

On December 12th, 2015, 196 member countries entered into a legally binding agreement, known as the Paris Agreement, to “hold the increase in global average temperature to well below 2°C above pre-industrial levels and pursue efforts to limit the temperature increase to 1.5 °C.”⁴ As a component of the Paris Agreement, all parties have been required to create and submit a nationally determined contribution (NDC) plan, which features explicit actions to be taken to decrease each party’s greenhouse gas emissions as well as “build resilience to adapt”.⁴ Subsequent annual COPs have seen the expansion of the NDC framework including the Enhanced Transparency Framework, a call for each party to revise and reinforce agreed-upon NDC targets under the agreement, and the Global stocktake program.⁵

In working to address their party's NDC commitments, several countries have taken to developing climate action plans (CAPs). Of note, CAPs are different than climate action and adaptation plans (CAAPs), and, in this body of work, are only referring to climate action plans. On a domestic scale, forty-five U.S. states have developed and implemented a CAP in addition to Washington DC, Puerto Rico, and numerous metropolitan areas, for which no exact number was able to be discerned.³ Non-governmental organizations like ICLEI – Local Governments for Sustainability have emerged to provide resources, such as professional workshops, emissions inventorying software, and community networks, to aspiring communities and planners. Acknowledged as a leading figure in international climate action planning, ICLEI is composed of over 2,500 local and regional governments, with many pursuing or already having developed their own CAPs.⁶ Under their framework, ICLEI advocates for CAP development to, universally, consist of calculating emissions, adopting targets, developing policies, implementing measures, and monitoring results.³ Yet, despite being the principal body, researchers have encountered a diversity within ICLEI members' plans instead of the anticipated standardized elements and format, which leads to the issue at hand.⁷

Developed at various levels of government, climate action planning takes on a life of its own as it reflects the needs, culture, and political landscape of each community it applies to, which understandably requires a necessary level of variability amongst plans. However, scholars have determined that there is an absence of an agreed upon suite of elements outside of greenhouse gas emission inventories and reduction goals.^{2,3,7} This has been connected to the formal climate action planning processes varying widely as a result of resources, workforce, and chosen level of community engagement during development.³ Although different in implementation, strategies tend to revolve around transportation options, efficiency within the built environment, and urban

land-use strategies, such as compact design.⁷ Yet, the type as well as how each strategy is implemented within a CAP has demonstrated a lack of consistency. To add to the issue of extreme variability, many argue that the current state of climate action planning results in documents that do not meet the accepted definition of “action plans” due to failing to “identifying actions, designate actors, or lay out timetables.”⁷

Despite this level of variability, climate action planning remains a highly regarded and commonly utilized tool in helping communities not only meet their emission reduction goals but also address the climate issues within the local area. Furthermore, the establishment of CHAMP at COP 28, which calls for the further integration of subnational governments’ collaboration and contributions, fortifies the role of CAPs at a more localized level.⁸ Due to the prevalence of, supporting international commitments for, and the present variability within CAPs, the question arose as to whether common elements, irrespective of the locale-specific influences, were present at different scales. A three-pronged approach was taken to answer this question. First, CAPs from five of the seven continental regions, with governance scales ranging from municipalities to national governments, were reviewed and examined for common elements. The common element categories explored were typical metrics, sector analysis, government relations and partnerships, and miscellaneous elements, which include, for example, land-use plans and Indigenous community input. The results were then analyzed and reported using data visualization techniques to demonstrate observed regional and global trends for elements, so as to provide a standard for planners when designing future CAPs.

Second, in exploring climate action planning from a global perspective, CAP elements, development process, and relative success are surveyed in a case study chapter focusing on Aotearoa (New Zealand) plans. The case study focuses on Aotearoa-based CAPs due to the unique

challenges faced by Oceania communities, the difference in the utilization of land-use strategies, and the apparent heightened inclusion of Māori—the Indigenous stewards of Aotearoa—engagement in plan development and goals. Following the spirit of community engagement in climate action planning, the final section of this work explores the current state of local participation. The section investigates the basics of participatory planning, the known benefits of community engagement, and the impact of engagement gaps present in CAPs. To complete the section, three key principles, based on conducted research, are featured as suggested engagement principles to be used by communities undergoing the planning process. The final product of this work aims to provide scaffolding for communities interested in creating a CAP but find themselves limited due to financial resources, labor, or inadequate training on environmental or planning issues. As the global community continues to work towards not crossing the 1.5 °C threshold, empowering local communities through supporting their CAP development efforts is key.

Chapter 2

Literature Review

On a global scale, the prevalence of climate action planning has grown over the past 30 years in response to the ever-changing climate crisis. Despite this surge in planning, many remain unaware of these actions and, even more so, the purpose that planning holds in combating climate change. At its heart, climate action planning is the written product of a community's agreed-upon activities to both adapt to and mitigate their contribution towards rising greenhouse gas emissions and, therefore, their impact on the global climate. Research conducted on previous and current work in the climate action policy sphere has concluded that resulting documentation has demonstrated significant value for communities in a variety of ways.⁹ When familiarizing oneself with climate action planning, there are several interconnected concepts that must be understood. These include the current understanding of mitigation versus adaptation, determinants of engaging in planning, resultant plans' strategies and elements, observed benefits and shortcomings, and the role of community engagement, as currently understood. A firm grasp of these concepts sets the stage for the research presented in this body of work.

Mitigation versus Adaption

As mentioned above, research suggests that current CAPs predominantly focus on mitigation, as opposed to striking a balance with adaptation strategies.¹⁰ To many, mitigation and adaptation are used interchangeably in reference to addressing the impacts of climate change, at any scale. Contrary to popular belief, a clear distinction exists between the two, as they not only require the inclusion of different elements but also have notably different impacts on communities.

Mitigation consists of any actions or strategies that plan or reduce greenhouse gas emissions.¹¹ Adaptation consists of any actions that allow a community to change and adjust to the effects of climate change.¹¹ Thus, the distinction of engaging directly with greenhouse gas reductions or not has come to characterize an action as mitigation rather than adaptation.¹² Furthermore, while both should be included in CAPs to most effectively address climate change, it has been acknowledged that adaptation policies and actions can contradict mitigation elements, which require political and community compromise for plan development.¹⁰

After a thorough literature review, discussions on mitigation versus adaptation inclusion in climate action planning were found to be discussed primarily within the context of American CAPs, thus the following information pertains to that existing pool. With several researchers in consensus, mitigation has been the poster child for climate action planning with only a small fraction of CAPs addressing adaptation within the document.^{3,7,10} There are a few reasons as to why understanding this reality is important when discussing the field of climate action planning. First, research suggests that adaptation is unrepresented in at least half of all climate action plans.^{3,7,10} Second, putting the previous point into perspective, research additionally suggests that the inclusion of adaptation in planning demonstrates the planning body's acknowledgment of health and environmental inequities, the reality of unequal predisposition to climate change's impacts, and adaptation's "inherently local impacts on citizens."^{7,10} This has potential ties to and implications for this body of work's call for increased community engagement in climate action planning, as to address a long history of global environmental injustice.

Finally, there is an interesting body of evidence put forward by Koski and Siulagi (2016) that claims adaptation's inclusion has the potential to overcome the political divisiveness associated with climate change, as currently encountered by mitigation strategies. This particularly

relates to communities currently without climate action plans, whether there is an expressed desire for one. Koski and Siulagi (2016) claim that "...because adaptation has been framed apart from traditional environmental issues, U.S. cities hitherto reluctant to engage in climate change policy may find adaptation planning an appropriate and less politically charged entry point into the discussion." The duo proceeds to support this claim citing their research, which found that how climate change was portrayed in plans significantly influences the inclusion of adaptation strategies.¹⁰ Notably, Koski and Siulagi (2016) found that CAPs featuring the characterization of climate change as a "hazard" integrated, by far, more adaptation strategies and elements. If this theory of "hazard" characterization leads to increased adaptation inclusion, this has the potential to begin addressing certain determinants that are key in getting the ball rolling on CAP development.

Climate Action Plan Determinants

Documents produced from this planning exercise contain a number of elements that are influenced by the communities' needs and planning Capacity. Communities involved in climate action planning range in size from as small as universities and municipalities up to the national level, although the latter is not present for certain large countries such as the United States. As one may expect, a community's political affiliations, geography, and recent, defined as occurring within the past decade, major events associated with climate change factor into both if and how a climate action plan is developed.^{2,10} However, the determinants of a climate action plan's existence and contents can be categorized into general conditions, which include "political demands", "trans-municipal networks", "institutional structure", "municipal financial Capacity", "proximity to

harm”, and “data availability.”^{7,9,10} Briefly, each determinant will be presented using summaries of current literature.

Starting with political demands, consensus exists on the strong correlation between large Democratic populations and a climate action plan existing for a community.^{2,10} This determinant can be further explored through community activism, local politics, and elected officials’ sway to public demands, thus making it one of the, arguably, most complex conditions.^{2,7,10} As a result, the scope of this determinant falls outside of the purview of this body of work. A corollary of the previous determinant, the existence of and engagement with trans-municipal networks serves as a strong influence on CAPs. Currently, several trans-municipal networks exist to promote climate action planning and participating communities, including ICLEI (global), the C40 Cities Climate Leadership Group (global), and the U.S. Conference of Mayors’ Climate Protection Agreement.¹² As discussed in the introduction, ICLEI demonstrates the power of such networks as it serves as a leading body on climate action planning, with members in over 125 countries globally.⁶ Not only do these networks serve as leaders in setting current policy guidelines and requiring reduction commitments, but also provide support to communities via resources, networking, and workshops. Another corollary to the first determinant is the structure of the local institutions, but no further information was found as it relates to climate action planning specifically.

Moving to municipal financial Capacity, there is a significant difference in the funding and Capacity of a Central Pennsylvanian municipality compared to a metropolitan giant such as Auckland. Yet, even within communities of a similar governance scale, state and even federal financial policies can disproportionately hinder one more than the other.¹³ An additional consideration exists when factoring in the presence of mitigation versus adaptation strategies, as, while the bill always falls on the community, the former provides a “collective benefit” for

humanity while the latter benefits a specific area.¹⁰ This consideration allows for a transition to “proximity to harm” as a determinant, supported by literature to be the “most reliable predictor of city-level mitigation and adaptation policies.”¹⁰ As communities, particularly those identified as coastal, find themselves closer to the “eye of the storm”, climate action planning has become more of a necessity to address the loss of resources, financial investments, and, most importantly, lives.

Finally, a community’s access to local data plays a key role, as it can either support or stall climate planning efforts.^{7,10,13} While access to existing data supports endeavors, the lack of and or inability to collect data, based on funds, workforce, or technological Capacity shortages, has been cited as the reason for elements being absent from plans despite being known as important to a community.⁷ All of these determinants intersect to determine a community’s ability to or momentum in developing a CAP. Not only that, but these determinants influence the strategies and elements found within a plan, thus leading to the next piece of the puzzle.

Strategies and Elements of CAPs

In a manner that represents the broad range of available guiding principles on plan development (see Deetjen et al. 2018, Seale et al. (2010), Seale et al. (2012)), there exists a variety of strategies and, subsequently, elements included in climate action plans.² For example, Deetjen et. al (2018) suggest the existence of five key climate change mitigation strategies, which notably have a strong presence across existing plans: “shifting transportation modes”, “reducing building energy consumption”, “reducing power sector emissions”, “improving public utilities and green spaces”, and “addressing regional impacts.” At the same time, ICLEI operates in such a way that it “promotes a climate change planning process based on five milestones: calculating emissions,

adopting targets, developing policies, implementing measures, and monitoring results.”³ It must be noted that the difference in the priority of strategies does not devalue either listing, but simply highlights the current variability amongst planning scholars. There is a strong consensus on several common elements being based on emissions inventories, thus demonstrating this element’s ability to provide a means to measure improvement.² Furthermore, there is a consensus regarding plans’ general inclusion of “core greenhouse gas emissions elements suggested in common protocols,” such as the Local Governments for Sustainability (ICLEI) protocol.²

When moving to further examine key elements, research has shown that the most common sectors targeted for development include transportation and energy efficiency.⁷ Whether addressing these sectors or others, as there are many other possible choices, research has also shown the existence of the most common actions. Traditional elements associated with climate action plans include greenhouse gas inventories, emissions targets, and sector reconfigurations that support the community’s environmental commitment. How these elements are carried out includes reducing vehicle use via ordinances, addressing sectors’ energy inefficiency, supporting lower footprint transportation through biking infrastructure and transit services, and tree planting, especially in urban areas combatting the urban heat island (UHI) effect.^{7,12} While less common, other elements include dense development adoption, parking restrictions, waste heat strategies, and albedo enhancement through mechanisms such as vegetation.^{9,12}

Additionally, how these actions have been evaluated when determining the quality of a plan has gained a level of agreement amongst planners. The extent of a plan’s success is commonly determined by comparing the community’s greenhouse gas emissions to the chosen baseline year.² However, scholars feel that there is a current lack of plans tracking progress leading those such as

Basset and Shandas (2010) to propose a more robust mechanism for evaluation such as the one below.

“Previous plan evaluation studies have commonly measured plan quality by examining the extent to which a plan identifies clear goals and objectives, contains factual analyses that provide an appropriate or sufficient basis for policy or strategy development, and articulates these policies or strategies in a way that facilitates implementation as well as monitoring and evaluation.”

Finally, public perceptions surrounding a plan and its elements have proven to be influential in both a plan’s creation as well as its success. At the same time, issue framing within a plan influences the definition of the problem within the context of the community, how to approach potential solutions, and restructures public perceptions.¹⁵ As a result, how climate change is referenced in the planning process and final document varies based on predominant cultural and political views within a community. Planners have employed new strategies, such as the previously introduced characterization of climate change as a “hazard”, to support CAP development in polarized areas. The social, cultural, and political standards that underpin a community must not be forgotten. In fact, these standards should be engaged with in climate action planning, as to create a successful plan.

Benefits and Shortcomings

Discernable from the previous sections, CAPs provide a significant suite of environmental benefits. Why else would it have grown in popularity so rapidly and remained steadfast? However, climate action plans have the possibility to not only contribute to the improvement of the local

environment but also to the sustainability of the community. Notably, Deetjen et al. (2018) highlight this truth by emphasizing how “climate action policies... can also impact economics, health, recreation, and other components of urban residents’ quality of life.” While existing literature cites the value at the urban level, 2’s restriction of benefits to only urban environments excludes the positive impacts experienced by suburban and rural communities with climate action plans in place, such as the participants of the Centre Region Council of Governments including the local own State College borough. Furthermore, elements of CAPs have the ability to not only impact emissions but also support other local policies.⁹ For example, Deetjen et al. (2018) cite that built environment energy efficiency improvements, the institution of technology, and certain infrastructure strategies as providing a multitude of benefits for the community. Additionally, Wheeler (2008) demonstrated that communities with a CAP have been found to reap the added benefits of positive stakeholder engagement and possessing a completed greenhouse gas inventory.^{2,3} While not the focus of this thesis, the benefits of CAPs in the suburban or rural context, although documented and acknowledged through word of mouth, is an area requiring further research to support such claims on a global scale.

As in all areas of study and practice, climate action planning and subsequent plans have been identified as having significant shortcomings—many of which need to be urgently addressed as the field continues developing. First, as mentioned previously, climate action plans, particularly those in the United States, have been found to lack integrated adaptation strategies, which have proven benefits across several scales.¹⁰ In addition, climate action plans tend to omit considerations regarding adaptations, which decreases the success of such plans in effectively addressing both short and long-term climate issues in the community.² Next, continuing with the theme of plans’ elements, members of the climate action planning community have cited the existence of

insufficient connections being established between included reduction targets and subsequent mitigation actions.² Such connections must include quantification of reductions from said actions to allow for a target's progress to be assessed.² In a similar vein, the existence of published reports discussing CAPs' progress is limited, at best, thus preventing evaluations that could prompt meaningful updates to said plans.^{2,3} Finally, in the context of CAP elements, current plans have received scrutiny due to overlooking known successful emission reduction strategies, lacking land-use practices, and opting for voluntary approaches instead of setting strict requirements, thus allowing for the further exacerbation of current climate-caused issues faced by the community.^{3,16}

Moving to shortcomings identified with the creation process of CAPs, the two most common stem from community engagement, and barriers posed by institutions' structures. In the context of community engagement and equity incorporation, an increasing number of CAPs over the past two decades have begun including concepts, language, and goals in furthering equity. This includes increased community engagement through measures such as participatory planning. Yet, the co-benefits of focusing equity have been claimed to remain less important to CAP planners than those of economic considerations, thus leading to a lack of meaningful inclusion.¹⁷

Furthermore, scholars such as Finn and McCormick (2011) have found that, despite this trend, "substantive engagement with these concepts in climate action planning is mainly rhetorical," and, in instances where significant community engagement is present, the sessions were predominantly elites and specialists.^{7,18}

Supporting the claim that such engagement methods are monopolized by a non-representative population, Cardullo and Kitchin (2019) corroborate community engagement's existence as remaining "peripheral" to the climate action planning process, as the focus remains on "informing and consulting... rather than focusing on involving, collaborating, and empowering

the public.”^{17,19} This reality has led to the utilization of the “checkbox” approach for equity’s incorporation into plans, which undeniably undermines meaningful engagement.¹⁷ As a result, scholars highlight that climate change policies lacking earnest equity incorporation have further exacerbated existing inequities—environmental, social, and economic alike—through realities such as “maladaptive practices”.^{15,20} Numerous pieces of planning and community engagement scholarship have also presented the confusion-rooted dilemma faced by planners regarding what strategies, both environmental and equity-based, are considered “best-practice.”^{3,17} Furthermore, a community’s level of inhibition could be further compounded by institutional and related structural obstacles.^{3,17} While nowhere close to a comprehensive review of equity issues within the realm of climate action planning, further exploration is featured in the community engagement section of this piece.

Moving Forward: A Corollary to Global CAP Expansion

With this more well-rounded understanding of the current state of climate action planning and CAPs, one can begin to understand the scope of the following research and results. As discussed throughout this section, the creation of a CAP is a complex and multi-faceted process that can be exclusionary to those communities without the resources, Capacity, or general environmental background inherent to other communities, with no blame placed on the latter. To both better understand global and continental trends as well as support the previously identified communities, research was conducted on a pool of selected plans to answer questions on what defines a CAP. The results of said work have the potential to inform CAP development as a

function of geospatial location, support communities invested in preparing for local-scale climate change impacts, and empower planners in decreasing their community's impact on a global issue.

Chapter 3

Climate Action Plan Structure: A Global Comparison Study

After identifying the gap in current climate action planning literature, policy, and implementation procedures, an international review of climate action plans was conducted. For this study, twenty-two climate action plans ranging from about 20 pages to over 200 pages were processed and documented. The literature review domain included five continental regions: Oceania, North America, Europe, Asia, and Africa. Specifically, only climate action plans from the United States were included within the scope of North America, thus limiting the extension of this research's applicability of this research to both Mexico and Canada. Climate action plans from Central and South America were not considered due to a similar pre-existing body of research from The World Bank existing for thirty city-scale climate action plans (see: Aires et al. n.d.). Furthermore, a climate action plan for Antarctica does not currently exist, but a climatic synopsis and recommendation report from the Scientific Committee on Antarctic Research does (see: Chown et al. 2022).

As climate action planning is occurring from the local up to the national scale, the selection of plans intentionally pursued a variation in governance scale to ensure that accurate representation was achieved. Featured in Table 1 below, the details of each reviewed plan, including governance scale, population, and region, are provided. For governance scales, cities were divided into four category-based population limits defined by the Organization for Economic Co-operation and Development: large (higher than 1.5 million), metropolitan (between 500,000 and 1.5 million), medium (between 200,000 and 500,000), and small (between 50,000 and 20,000).²³ In total, there were ten large cities, four metropolitan cities, one medium city, four regional scale, one state scale,

and two national scale entities. Additionally, plans were selected based on English versions of the document being available to protect against any loss of meaning due to utilizing language translation software.

Table 1. Summary of reviewed plans and associated attributes.

Location	Title	Region	Governance Scale	Population ²⁴⁻⁴⁵
Accra, Ghana	<i>Accra Climate Action Plan: First Five-Year Plan (2020-2025)</i> ⁴⁶	Africa	City, large	2,300,000
Auckland, New Zealand	<i>Te Tāruke-ā-Tāwhiri: Auckland's Climate Plan</i> ⁴⁷	Oceania	City, large	1,673,000
Centre County, Pennsylvania, USA	<i>Centre Region Climate Action & Adaptation Plan</i> ⁴⁸	North America	Regional	158,425
Chennai, India	<i>Climate Action Plan Chennai</i> ⁴⁹	Asia	Regional	11,776,000
Copenhagen, Denmark	<i>CPH 2025 Climate Plan: roadmap 2021-2025</i> ⁵⁰	Europe	City, metropolitan	1,381,000
Durban, South Africa	<i>Durban Climate Action Plan 2019</i> ⁵¹	Africa	City, large	3,228,000
Frankfurt, Germany	<i>Masterplan 100% Climate Protection</i> ⁵²	Europe	City, metropolitan	796,000
Houston, Texas, USA	<i>Houston Climate Action Plan Resilient Houston</i> ⁵³	North America	City, large	2,314,157
Istanbul, Turkey	<i>Istanbul Climate Change Action Plan</i> ⁵⁴	Asia	City, large	15,848,000
Kenya	<i>National Climate Change Action Plan 2018-2022</i> ⁵⁵	Africa	National	58,246,378
Madrid, Spain	<i>Madrid 360: Roadmap to Climate Neutrality by 2050</i> ⁵⁶	Europe	City, large	6,751,000
Mombasa, Kenya	<i>Mombasa County Climate Action Plan 2023-2050</i> ⁵⁷	Africa	City, metropolitan	1,400,000
New Taipei, Taiwan	<i>City of New Taipei Climate Action Plan</i> ⁵⁸	Asia	City, large	4,504,000
Northland, New Zealand	<i>Ngā Taumata o Te Moana: Our strategy for tackling</i>	Oceania	Regional	203,900

	<i>climate change</i> ⁵⁹ and <i>Te Tai Tokerau Climate Adaptation Strategy</i> ⁶⁰			
Orlando, Florida, USA	<i>2018 Community Action Plan</i> ⁶¹	North America	City, medium	316,081
Paris, France	<i>Paris Climate Action Plan: towards a Carbon Neutral City and 100% Renewable Energies</i> ⁶²	Europe	City, large	11,208,000
Pennsylvania, USA	<i>Pennsylvania Climate Action Plan</i> ⁶³	North America	State	12,970,000
Portland, Oregon, USA	<i>Climate Action Plan: Local Strategies to Address Climate Change</i> ⁶⁴	North America	City, metropolitan	635,067
Sydney, Australia	<i>Environmental Strategy 2021-2025</i> ⁶⁵	Oceania	City, large	5,121,000
Te Rūnanga o Ngāi Tahu	<i>Te Tāhū o Te Whāriki: Anchoring the Foundation</i> ⁶⁶	Oceania	Regional	84,969
Tokyo, Japan	<i>Tokyo Climate Change Adaptation Plan</i> ⁶⁷	Asia	City, large	37,194,000
Tonga	<i>Joint National Action Plan 2 on Climate Change and Disaster Risk Management</i> ⁶⁸	Oceania	National	104,889

In conducting this review, a pre-determined suite of elements included in climate action plans was sought out in each plan and, if present, resulted in the element being recorded for that plan. This information was collected to inform the creation of a basic framework for climate action plans influenced by agreement among global, continental regions, and governance levels. The suite of elements included in the analysis can be differentiated into five primary categories with a sixth serving as an “others” category. The five primary categories were key metrics, collaboration mechanisms, sector analysis, projection and insight tools, and community engagement. To

summarize each category, Table 2 features the rationale behind each category as well as example elements. Each category will be explored in depth throughout the remainder of this section.

Table 2. Summary of primary investigated categories of plan elements.

Category	Rationale	Example Elements
Key metrics	This category of elements allows for evaluation, tracking, and data management that influence other elements.	Greenhouse gas inventory, commitments, targets, actions, carbon budget
Collaboration mechanisms	This category of elements promotes the sharing of resources, offers support, and fosters common practices among planners and governments.	International policy acknowledgment, partnerships, and government involvement or role.
Sector analysis	This category of elements allows the prioritization of relevant sector-based issues while also forcing the analysis of possibly previously overlooked sectors.	Sectors such as economics, education, water, waste, and more.
Projection and insight tools	This category of elements enables plans to consider future impacts of both action and inaction, so as to acknowledge the outcomes of decisions made and the influence of community investment in issues.	Projected climate risks, workforce projections, decarbonization plans, and case studies
Community engagement	This category of elements demonstrates the necessary actions required for promoting equity and justice as well as preventing maladaptation.	Community engagement, equity, Indigenous perspectives and input, and intergenerational commitment
Other	This category of elements emerging techniques and mechanisms that do not fit the definition of previously noted categories.	Progress tracking, land use, and CAP development process

Key Metrics

At the basis of any climate action plan lies a greenhouse gas emissions inventory. Serving as the poster child for ICLEI’s climate action planning movement, greenhouse gas inventories determine the position the planning government finds itself to be in within the context of climate change, highlight key areas of improvement as well as success, and open the door to possibilities for future adaptation and mitigation. Yet, greenhouse gas inventories are not the only frequently utilized metric in climate action plans. In addition to greenhouse gas inventories, climate action plans feature commitments, targets, actions, and carbon budgets, which serve as metrics for tracking progress. To differentiate these five metrics, particularly targets, actions, and commitments, Table 3 includes descriptions of each.

Table 3. Descriptions for each of the five key metrics.

Key Metric	Description
Greenhouse gas inventory	A database of quantified greenhouse gas emissions from various sectors across the community of interest.
Commitments	A promised activity that is associated with a metric or quantifiable result.
Targets	A goal that is associated with a definitive year for achievement.
Actions	An implementable measure that supports a commitment or target.
Carbon budget	A limit for the carbon emissions related to location-specific emissions.

After reviewing this study’s sample of plans, the inclusion of each key metric was integrated by continental region, as shown in Figure 1. Unsurprisingly, greenhouse gas inventories are proven to be a common element across all examined regions, but, surprisingly, not the most common. Actions are identified as the most common metric in climate action plans, occurring in 95.46% of all reviewed plans, with targets ranking as the second most common, occurring in 90.9% of plans. Globally, there appears to be disagreement surrounding the implementation of

commitments, particularly throughout the United States and Europe. In the context of the United States, this may be due to the lack of a national infrastructure for addressing climate change, which is further exacerbated by the recent sharp oscillations in partisan leadership. However, this theory is currently untested and would require a significant period of further investigation. Another noteworthy difference among plans is the rarity of the inclusion of carbon budgets, with only one plan from both Oceania and the United States featuring the metric.

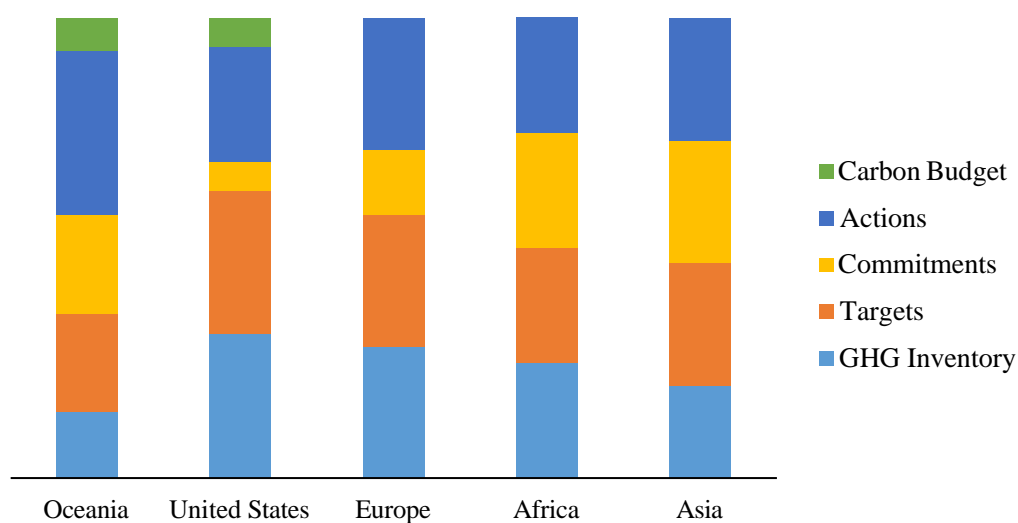


Figure 1. The inclusion rate of key metrics as a function of plans' continental region.

To gain a more comprehensive picture of these metrics' implementation, the inclusion rate for each key metric was determined as a function of their governance level, as seen in Figure 2. To investigate the commonality of each element as a function of their governance scale, elements were considered significant when appearing in more than 65% of the reviewed plans of that scale. The singular state-level and medium-sized city plans were omitted from this analysis due to a limited sample for each governance scale. For greenhouse gas emissions, the inclusion rate is found to be significant in plans for large cities, metropolitan cities, and regions. Notably, all 198

national members of the Paris Agreement are required to submit nationally determined contributions that are related to the nation's greenhouse gas inventory, so there may be additional information for the national-level plan type.

For targets, the inclusion rate is found to be significant for all four scales featured in the figure. Moving to commitments, only metropolitan regions have a significant inclusion of the element; further research is required to determine the reasoning. For actions, the inclusion rate is found to be consequently for both large city and regional-scale plans. Finally, in plans of any governance scale, carbon budgets do not appear to be a significant element at this time. As climate action planning continues to develop in parallel to dynamic climatic changes, carbon budgets may become a significant element for inclusion but will require a greenhouse gas inventory before implementation.

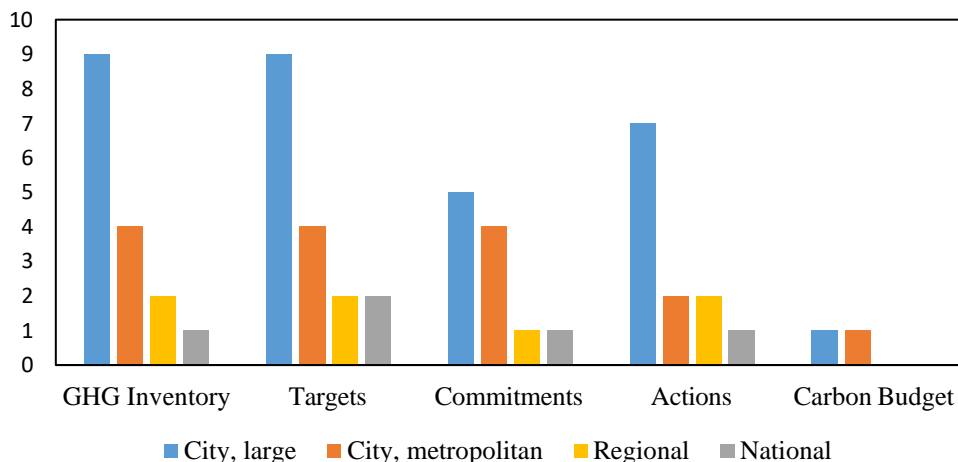


Figure 2. Key metrics' inclusion in plans as defined by governance scale.

Collaboration Mechanisms

Transitioning to the next primary category of elements, collaboration mechanisms are critical in a plan's creation as well as implementation success, due to the vast array of resources and support these mechanisms can provide. First and foremost, a plan's acknowledgment of international climate policies, such as the 2015 Paris Agreement, orients the creation process for a CAP in terms of meeting the associated established timeline, goals, and requirements. This is particularly important for national or state-level governance scale plans, as their plans are perceived as key in impacting their country's NDC. Regardless, this element is still relevant to other governance scales, as members of C40 Cities Climate Leadership (C40, for short) or ICLEI commit to supporting a country's NDC at the local level. Next, the level of government involvement in a plan's inception can determine elements such as primary or supplemental funding, establishing or strengthening mutually beneficial relationships, and resource sharing. All of these can be key for planning groups lacking capacity or expertise. Finally, non-governmental partnerships are one of the largest sources of resource sharing amongst planners and plans' associated governments.

As seen in Figure 3 below, all three types of collaborative mechanisms are included in over 65% of the reviewed plans, with the most common being the acknowledgment of international policies. Arguably, this element may be the easiest to incorporate, as the plan can explicitly discuss international policies but may not detail the exact ways in which the policy or policies are adhered to within the plan. As a result, this research advocates for the meaningful and quantifiable integration of international policy. Government involvement is the least commonly included element of the collaboration mechanisms category, but this may be due to certain plans existing

for the state or national level. In such cases, planners or governments may automatically assume cross-collaboration with the other. Finally, 73% of the reviewed plans highlighted participating in non-governmental partnerships.

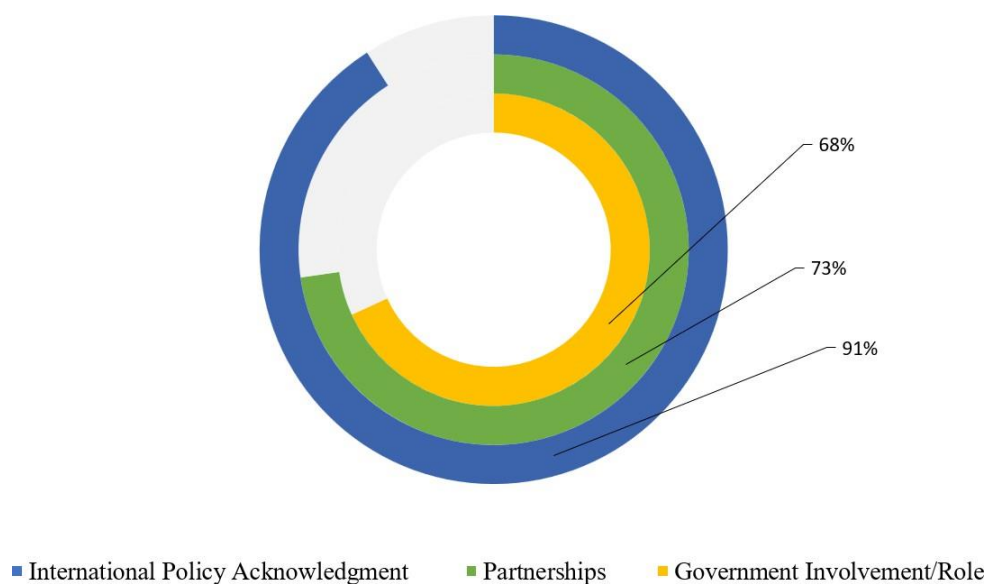


Figure 3. Prevalence of collaboration mechanism elements in sample population plans.

Expanding upon the topic of non-governmental partnerships, five organizations focused on these collaborations are commonly present throughout the sample: ICLEI, the Global Covenant of Mayors, the Conference of Mayors, the Compact of Mayors, and C40. All previously mentioned organizations are active at the international level except for the Conference of Mayors, which is a United States-focused collaboration. The overall frequency of each identified non-governmental partnership organization across all twenty-two plans can be found in Figure 4. As the figure shows, the most common partnership organization featured in CAPs, both in the development process of and reinforced in the document itself, is C40 Cities Climate Leadership. Globally, this finding is surprising due to ICLEI's significant contributions in the field of climate action planning. Ultimately, each organization has different membership requirements and fees; thus, planners and

the local government are encouraged to conduct a cost-benefit analysis on joining each before choosing the best fit.

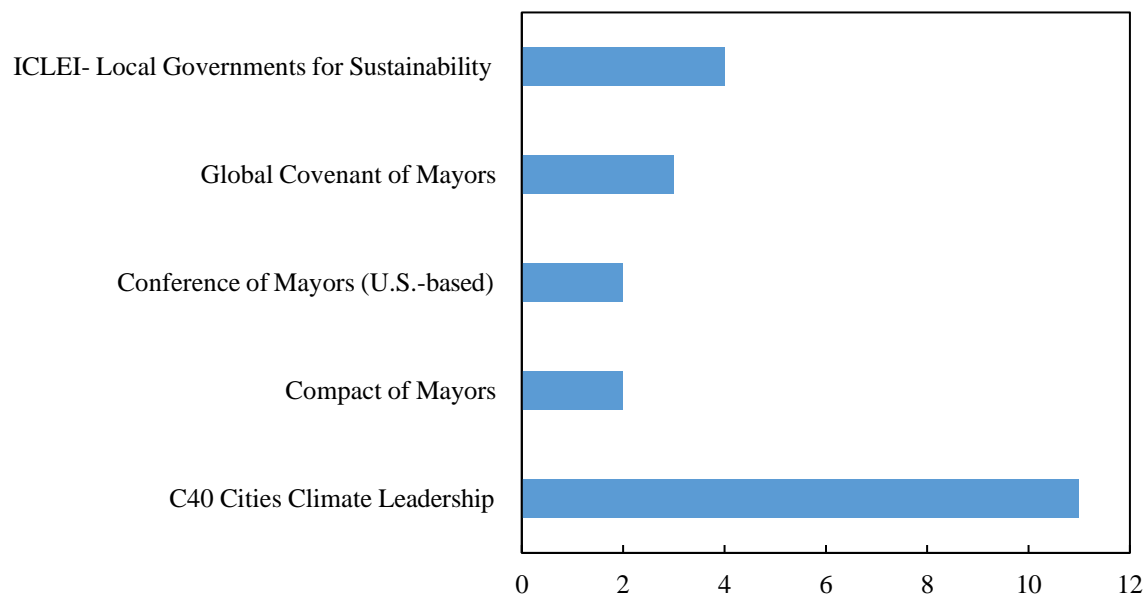


Figure 4. Frequency of each non-governmental partnership organization in all reviewed plans.

Due to the complexity surrounding non-governmental organizations, a further exploration was conducted. As a majority of the partnership organizations primarily work with large and metropolitan cities, such as the Global Covenant of Mayors and C40, a continental region analysis was completed in place of one focused on governance scale. As depicted in Figure 5, such partnerships are most prominent in Asian, African, and American CAPs. As mentioned above, one of the primary non-governmental partnership organizations, the Conference of Mayors, is solely comprised of American mayors; thus, results may be skewed due to three of the five plans from America highlighting membership with this group. In African CAPs, the most common partnership organization was C40 while in Asian CAPs, the most common organization is a three-way tie between C40, ICLEI, and the Compact of Mayors. The two plans in Europe that discussed such

partnership organization membership were both members of C40, which was also the case for the majority of Oceania plans.

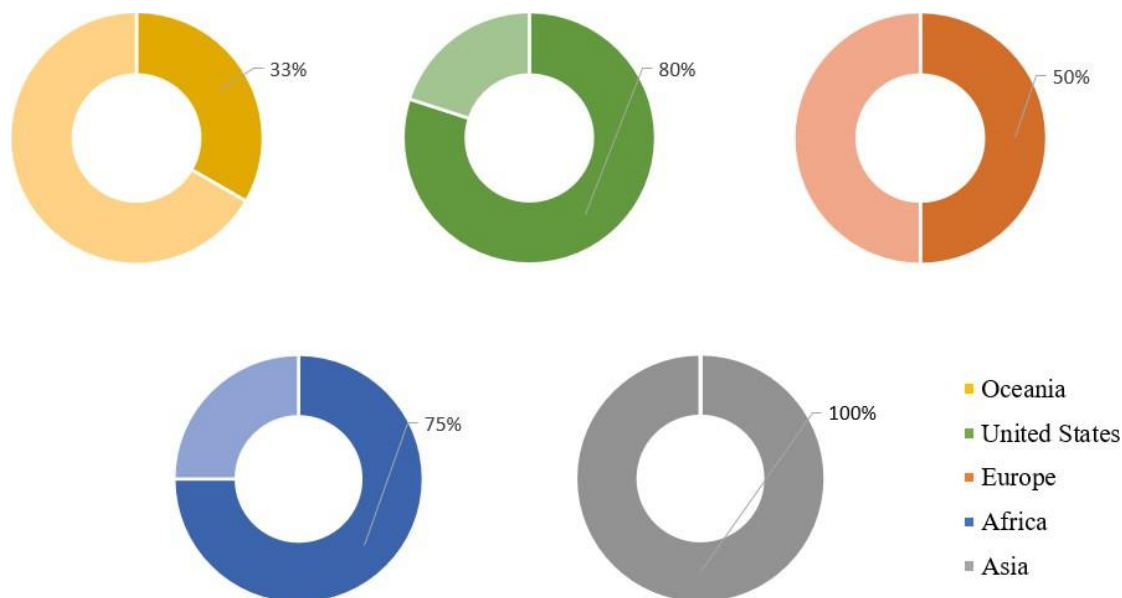


Figure 5. Inclusion of non-governmental partnerships as differentiated by continental region

Sector Analysis

Reaching the most diverse category of elements, sector analysis allows a planner or government to take account of all intersecting aspects of real-life behaviors in their community. The analysis provides a platform for investigating the intersection of sectors with one another in terms of each of the three pillars of the triple bottom line. It also prompts the acknowledgment, or even realization of, the existing relationship between each sector and daily operations. In many cases, several of the sectors available for analysis are connected, directly or indirectly, to the local government body due to existing local public works, services, or operational facilities. The inclusion of sectors based on one's analysis can include explicit goals and commitments, discussions regarding the influence one sector has on others, or an acknowledgment of the need for further exploration of a sector.

Across the sample plans reviewed, there were ten common sectors identified: Agriculture and Food, Built Environment and Infrastructure, Economy, Education, Energy and Industry, Environment, Health, Transportation, Waste, and Water. The prominence of each sector was investigated as a function of the continental region as well as the determined cumulative global prominence. No further differentiation by governance scale was conducted, as all sectors were determined to be relevant for all governance scales. Of note, those that essentially include two sectors, such as agriculture and food, do not mean that both were present, but, rather, at least one of the two was. All results are displayed in Figure 6 as a bubble matrix.

Starting with one of the least commonly appearing, agriculture and food appeared in only 50% of all reviewed plans. Both extremes of the inclusion rate scale can be observed for this sector, as none of the Asian plans discussed food and agriculture while all the African plans did. In between those extremes, only one of the European plans included the sector while both Oceania and the United States saw 60% of plans featuring agriculture and food. As one of the necessities of life, it is noteworthy that food was nearly or entirely omitted in two continental regions' suite of reviewed plans. A possible explanation is a correlation between the proportion of "developed" countries in each region and food or agriculture insecurity. However, this theory excludes the American plans, as the United States is regarded as "developed." Another theory is the location of a government—urban versus suburban versus rural—impacts the inclusion of this sector, as agriculture is unable to be conducted at a large scale in urban environments. These theories are untested but are included to prompt possible future research.

Conversely, the built environment and infrastructure, as a singular sector, was the most frequently included in plans around the world, with an inclusion rate of 95% across all plans. Buildings and infrastructure are utilized every day by a majority of people on Earth, which means the use of energy, materials, and land to accommodate these needs. To date, the built environment contributes at least 37% of the world's global emissions, thus prompting heightened attention from the scientific and planning community on the sector's contributions to climate change.⁶⁹ As urbanization continues to rapidly expand, this sector is expected to continue growing in prominence. The built environment and infrastructure sector

is an arguably easier sector to begin an analysis for due to documentation including utility bills, construction and materials documentation, and legal papers. All plans from the United States, Africa, Asia, and Europe included this sector, and 80% of Oceania plans featured it as well. As a result, this sector appears to be a required element of climate action planning.

Next, economic considerations were investigated. This avenue of study yielded a 55% inclusion rate of considerations for the relationship between the economy and climate. Discussions surrounding the economy ranged from emerging finance opportunities, such as carbon offsets and markets, to financial capacity for environmental changes to funding mechanisms, such as national DOE grants. The role of the economy has been shown to be integral to climate change efforts at any scale, as it both impacts action and is itself influenced by climate-related actions. Once again, both extremes were found, as 100% of European plans featured it while no Asian plans were found to. Economics was found to be significantly tied to climate efforts in Oceania plans, with 80% of reviewed plans featuring the sector, while remaining questionable for both American and African plans, appearing in 40% and 50% of plans respectively. There is currently no insight into this distribution's reasoning.

Moving to the education sector, there appeared to be a significant rate of inclusion throughout observed plans around the world with 68% of plans including education. The inclusion of education includes features such as implementing community educational resources, integrating sustainability or climate curricula in K-12 schools, and offering educational events, among other options. Featured in at least 50% of each continental region's CAPs, the gap between the inclusion or omission of this element is one of the narrower ones. Notably, African CAPs are seen to most frequently include education and associated efforts, which is followed by Asian CAPs. Following suit, 60% of plans in both Oceania and the United States included the sector while European plans included education the least, with two out of four plans featuring education. One question for further exploration is the status of sustainability and climate within each region's educational system, as it may already be integrated and, thus, omitted in plans due to being commonly assumed.

The next sector investigated was energy and industry, which was the second most commonly included with an 82% global inclusion rate. In addressing the subject, this sector is one of the broadest in terms of potential mechanisms and elements. Such elements can include renewable energy transition commitments, fossil fuel plant sustainability efforts, such as scrub stack installation, industry efficiency measures, and more. Once again, a narrower range of inclusion compared to exclusion was found, as inclusion ranged between 50% and 100%, but this time with three of five regions' plans all including discussions on energy or industry. Asian plans were found to have the lowest level of inclusion for the sector, occurring in only 2 out of 4 plans. Oceania plans were found to be on a similar level with only 60% of plans featuring the sector. With almost all countries today depending on energy and many depending on industry, the increased inclusion of this element in Oceania and Asian plans is anticipated, particularly as energy transitions and energy accessibility continue to progress.

Following energy and industry, a sharp, arguably 180-degree, turn was made to investigate the next sector, which was the environment. Despite being a perceived core tenant to climate action planning, the environmental sector is only discussed in 59% of all reviewed plans. In incorporating the environmental sector within a CAP, numerous mechanisms including ecosystem preservation and restoration, species protection, and environmental tourism exist. While there can be a large amount of overlap between chosen mechanisms for other sectors, environmental sector elements have the potential to be incredibly unique to each plan, so as to meet the area's specific ecosystem needs. Oceania plans were found to have the highest rate of inclusion for this sector, but somewhat surprisingly and without an air of competition, did tie with the United States. African CAPs were not far behind, with 75% of the reviewed plans including environmental elements. Significantly different from these three continental regions, European and Asian plans yielded only one plan each that included the environmental sector.

As the fifth most commonly included sector, health was found to be included in 73% of all plans reviewed. Once again, the narrow range for inclusion rates across the five continental regions is present, as the results ranged from 50% to 100% of plans featuring the sector. Both human and non-human health are

being negatively impacted by the changing climatic conditions. The acknowledgment of this reality is a highly plausible factor as to why this sector has a higher rate of inclusion. For the African plans, all the CAPs included health strategies or commitments, which may be a result of the existing heightened vulnerability to and climate change's projected impact on health crises like vector-borne diseases.^{70,71} Conversely, only 50% of European plans included discussions on health impacts, actions, or commitments. As European countries continue to experience increasing impacts from climate change, particularly heat waves and associated impacts, this rate of inclusion is anticipated to rise.⁷² All within a similar range, the remainder of the review saw 80% of American plans, 75% of Asian plans, and 60% of Oceania plans including health-related elements.

Shifting back to the man-made world, transportation is found in 77% of reviewed plans, causing a tie between this sector and the waste sector for the third most commonly included. Transportation elements include infrastructure maintenance, public transportation networks and accessibility, and the start of clean fuel transition, to name a few. For the third time, the investigation saw a three-way tie for the highest inclusion rate between American, European, and African CAPs, all at 100%. In a somewhat stark contrast, the region with the second highest rate of inclusion is Asia with 50% of plans including transportation elements. Finally, as one of the least commonly included sectors for the entire region, only 40% of the reviewed Oceania plans included transportation measures. In working towards explaining the overall trend of inclusion for this sector, it must be acknowledged that lower rates of inclusion may be a result of existing strong public transportation, clean fuel incentive systems, or a lack of accessibility to transportation, both public and private.

Moving on to investigate the other sector that was included in 77% of all reviewed plans, waste appears to follow the same overall distribution trend as the transportation sector. As a very popular topic amongst the general public in recent years (see: the Great Garbage Patch, single-use straw campaigns, and fast fashion discourse), waste covers organic and inorganic waste, consumption patterns and attempted behavioral adjustments, environmental justice issues regarding dump zonings, and more. As areas pursue

waste minimization efforts, it must be acknowledged that there is still an existing pipeline of waste from developed countries to developing countries, despite the existence of the 1988 Basel Convention.⁷³ This is a key part of the global problem, which must be addressed in CAPs moving forward. Waste is the final sector that has a 100% inclusion rate in American, European, and African CAPs. Following the previous sector's trend, Asian plans have a 50% inclusion rate while Oceania plans sported a 40% inclusion rate.

For the final sector, water is included in 64% of plans, thus making it the sixth most common sector out of the ten investigated. Water sector elements can include clean water commitments, water rights and distribution agreements, and green infrastructure strategies, among many others. Of note, no continental region had a 100% inclusion rate, despite water being a necessity for not only quality of life but life itself. Oceania had the highest rate of inclusion for this sector at 80% of plans, which is likely due to the large number of island nations concentrated in this region. Both African and Asian plans have an inclusion rate of 75% while European and American plans have inclusion rates of 50% and 40% respectively. A notably lower rate of inclusion, European and American plans' inclusion rates may be due to a comparative lack of concern held by the general population for personal impacts from sea level rise and overall water accessibility, but this remains untested.

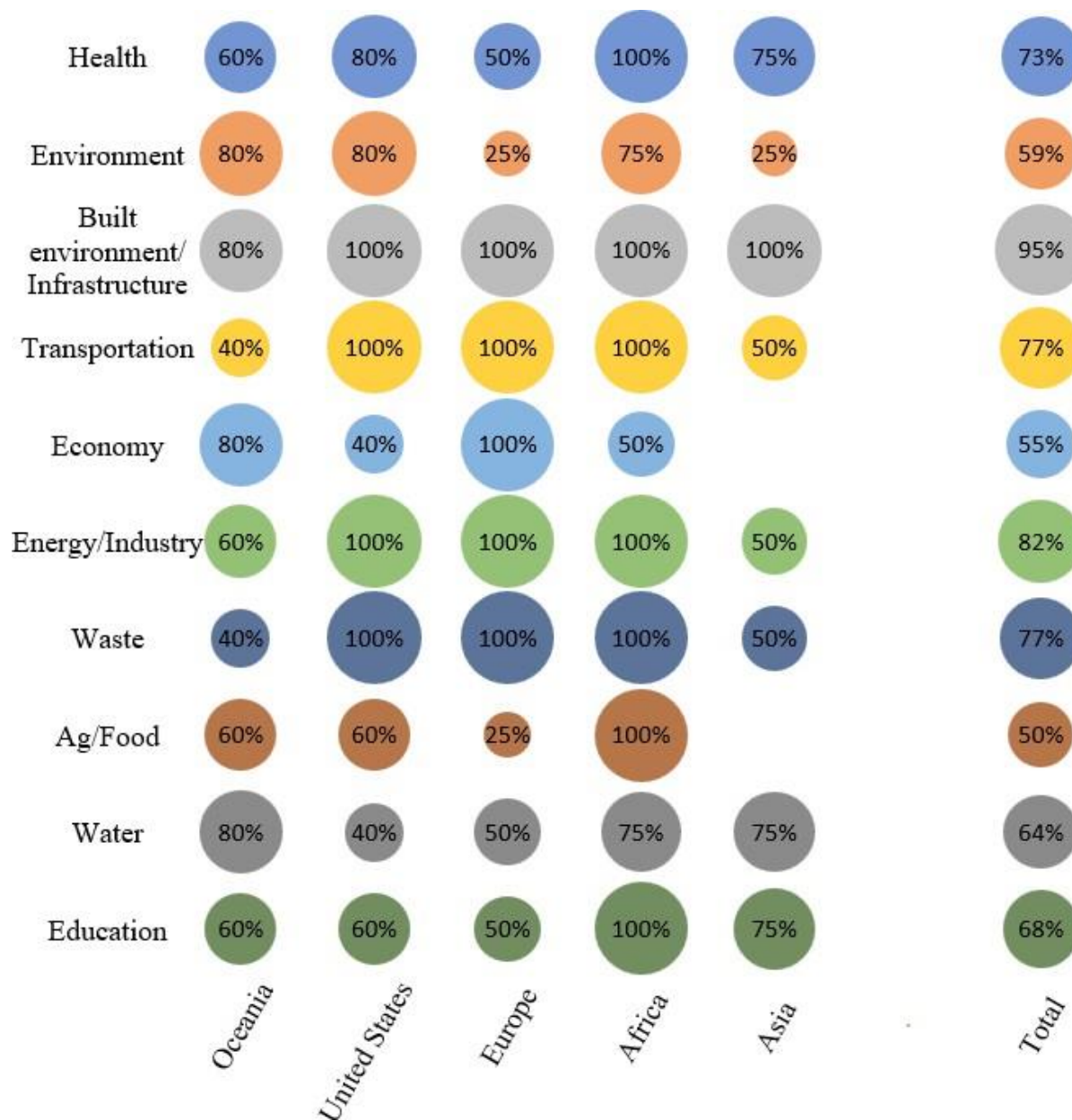


Figure 6. Prominence of each sector's inclusion in CAPs as differentiated by region and as a whole sample population.

Projection and Insight Tools

Following suit, the next primary category of elements investigated in the sample CAPs can be most accurately described as projection and insight tools. Elements falling within this category include location-specific projected climate risks, decarbonization plans, featured case studies, and workforce projections. It is acknowledged that there are a variety of other projection and insight tools that could be included in a plan, but these four are the most commonly appearing ones throughout the sample. Projected climate risks and decarbonization plans are unique in that possessing a greenhouse gas inventory is highly useful, if not mandatory. Thus, a connection between elements of different categories can be established, which would require the inclusion of a greenhouse gas inventory to feature the other elements. Case studies and work projections require other previous research and data analysis to be conducted, which can be done through other local government departments, outside contractors, or, in certain cases, citizen science.

Illustrated in Figure 7, the category's most common element in CAPs was the inclusion of projected climate risks, appearing in 82% of reviewed plans. Not only is it the most common overall, but the projected climate risks element is the most common for every governance scale, as seen in Figure 8. This may be in part due to the utilization of pre-existing projected climate risks of entire regions or countries, for which the plan's location falls, that are conducted by national laboratories. The use of such data does not come at a large expense for the local government and planners, thus theoretically increasing the ease of incorporation. Both decarbonization plans and workforce projections can be found in 36% of sample CAPs. However, this figure for decarbonization plans' inclusion may be skewed by a comparably sizable number of large cities including this element, as compared to other governance scales. The increased prominence of

decarbonization plans in large cities' CAPs may be the result of a more appropriate scale for decarbonization planning or because of workforce and financial resources for implementation, as compared to at the national level, for example. This theory remains untested but would be impactful if researched further.

Looking at case studies, only 32% of reviewed plans include this element. Notably, the inclusion of this element appears to occur in large or metropolitan cities indicating that this element may currently be unique to urban environments. This may be due to the resources and capacity constraints discussed above, a greater suite of sources for sampling in the area to complete a study on, or a combination of both factors. Finally, workforce projections are less commonly explored in national or regional plans but are equally prevalent in large, metropolitan, and medium-sized cities. The smaller scale of cities compared to national and regional plans may contribute to the prevalence of this final element in city-scale plans. This could be the case due to possibly yielding more accurate projections because of smaller populations and a comparatively smaller time or workforce commitment needed to be completed at the city level. However, the financial and workforce capacity of national and regional planners is somewhat regarded as more robust than that of smaller-scale planning groups. Thus, these results introduce a possible disconnect between a common conception and the observed inclusion pattern.

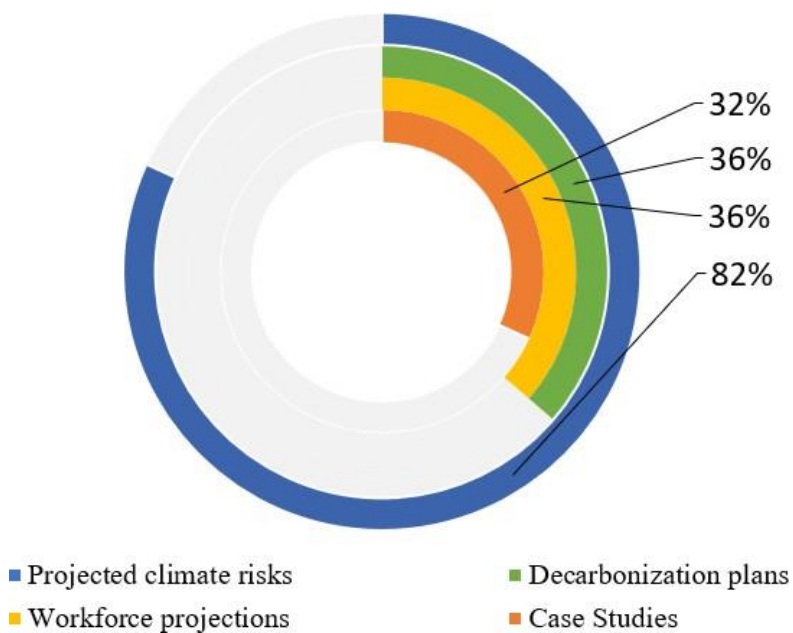


Figure 7. Prevalence of projection and insight tool elements in sample population plans.

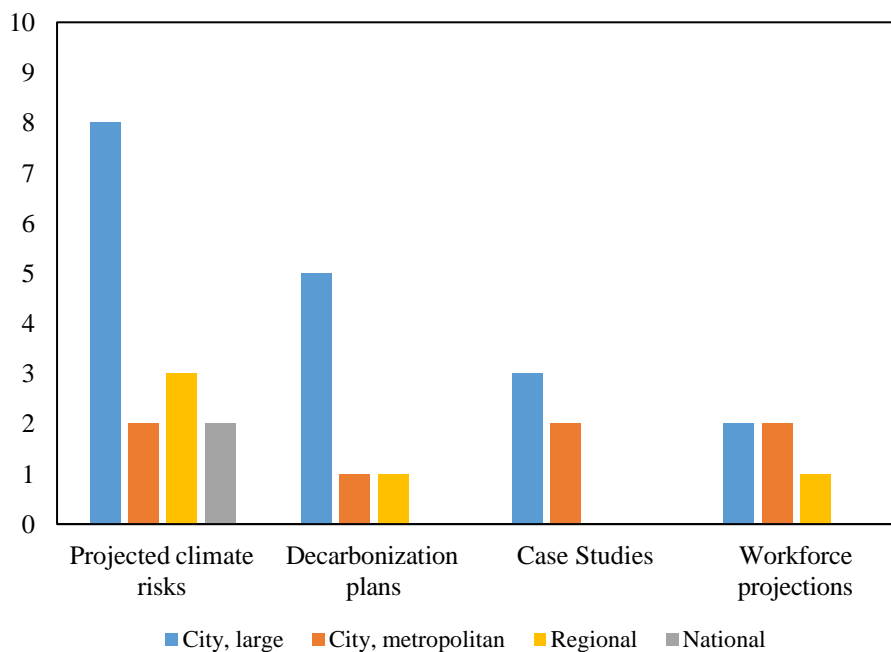


Figure 8. Inclusion of projection and insight tool elements by governance scale.

Community Engagement

For the final primary category of plan elements, climate action plans around the world, especially those that have partnerships with organizations such as C40 and ICLEI, are increasingly acknowledging the suite of elements available that relate to community engagement. In this study, this category's elements include community engagement methods and actions, discussions of equity's role in climate planning, Indigenous perspectives, and pledges to international commitments. While these elements may seem limited in number, it is the hope that, as the field continues to develop, the number of applicable elements will expand to account for the complex reality of equity, justice, and community in environmental work. Until then, this analysis proposes the four aforementioned elements, as their inclusion was the highest among the reviewed plans.

As a category, community engagement may be the most unique and broad-spanning of all those researched, due to engagement's inherent intersection with socio-economic identities, pre-existing discrimination and exclusion, and persistent accessibility barriers. As a virtue of the category's previously mentioned uniqueness, all included elements are distinct as they vary by implementation mechanism and the community itself. However, there is no definitive proof of earnest behavior, genuine collaboration, or, sometimes, even explicit detailing of implemented community engagement methods, which differs from other categories' elements that can be or are tracked over time. Due to this, a more thorough overview of community engagement's role in CAP planning will be discussed in the fourth section while the investigation into the rate of elements' inclusion is concluded here.

As depicted in Figure 9, the relative prevalence of the four elements across the domain of plans shows that, by in large, community engagement and discussions of equity are the most

common. One of the most notable discoveries for this section is community engagement being present in 59% of all reviewed plans, as current literature cites a lack of such inclusions in plans.¹⁷ Furthermore, the review found that community engagement was equally prominent when developing CAPs in Oceania, American, and African plans. Conversely, as seen in Figure 10, both European and Asian plans had almost no community engagement mechanisms incorporated, which supports the previous findings of the generalized literature. There is no certified reasoning behind this regional trend for community engagement, but it is possibly, in part, a function of cultural norms for each continent.

Transitioning to investigate the inclusion of equity, it must be acknowledged, again, that this element's presence in a plan has the potential to be purely performative. This is especially true due to equity being considered a "buzzword" or a checkbox requirement in recent years.¹⁷ As a result, the accurate implementation of equity in a plan including this element cannot be garnered from simply reading the document. That being said, equity or a discussion of its incorporation in a plan's creation was found in 50% of all plans, as shown in Figure 9. As depicted in Figure 10, the inclusion of equity is featured in half or more of the plans from the United States, Oceania, and Africa, with American plans having the highest occurrence. Notably, not a single European CAP mentions equity considerations within the confines of the document. This is not to say it is not inherently included, but rather that it is not explicitly stated. As equity has a wide array of mechanisms through which it can begin to be achieved, a further exploration of the concept of equity in climate action planning can be found in the fourth section.

Moving to investigate this category's less commonly included elements, both Indigenous perspectives and input as well as intergenerational acknowledgment were found in less than a fifth of the reviewed plans, occurring in 18% and 14% of all reviewed plans respectively. Interestingly,

both elements were only identified in Oceania plans. This poses a correlation between the two elements, which this paper stipulates is functionally dependent on the inclusion of Indigenous perspectives and input. Around the world, a commitment to intergenerational prosperity can be found as an important facet of Indigenous Peoples' being and way of life.⁷⁴ As a result, one can argue that the meaningful inclusion of Indigenous Peoples in the planning process would lead to an increased inclusion of intergenerational consideration and commitment.

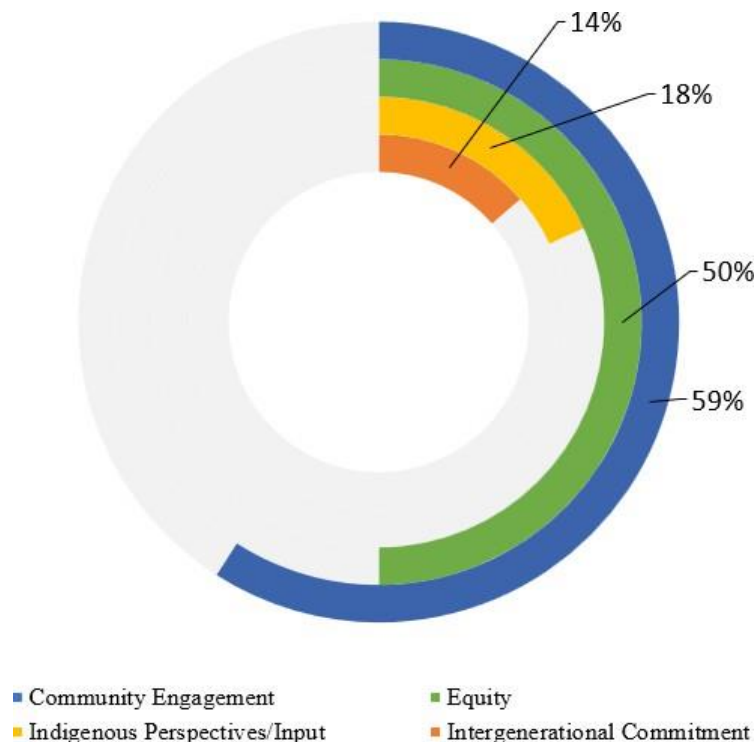


Figure 9. Prevalence of community engagement elements in sample population plans.

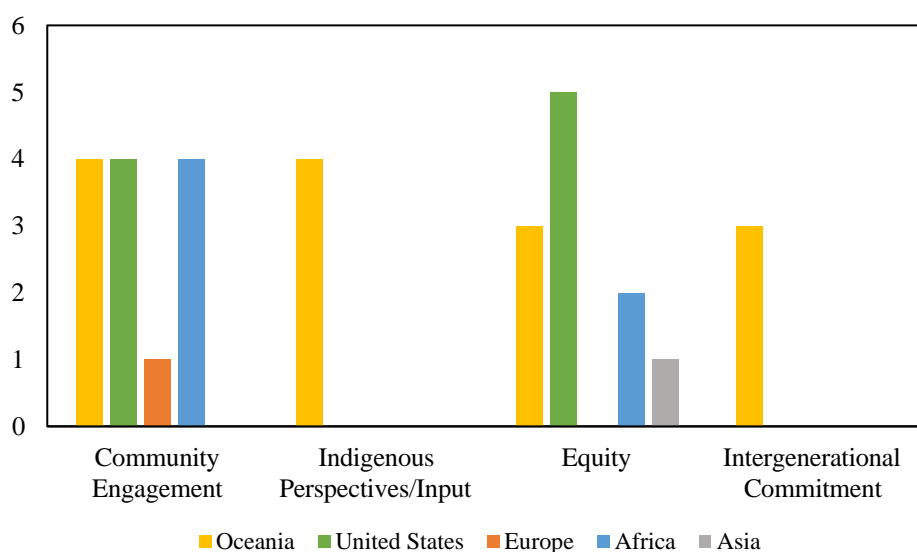


Figure 10. Community engagement elements' inclusion as a function of continental region.

To further investigate the inclusion of community engagement, as it is a key research area for this body of work, the inclusion of each element was also explored as a function of governance scale. National governments have the highest frequency of inclusion for community engagement at 100%, as seen in Figure 11. However, this may be an outlier compared to all national plans globally, due to only reviewing two national scale plans. Large cities have the second highest rate of inclusion for community engagement with 60% of reviewed plans featuring this element. Following suit, equity was most frequently included in national plans, at 100%, followed by regional plans, at 50%, and large cities, at 40%. This occurrence may be a function of the “check in the checkbox” narrative, which is untested but would, again, be an important area of research in the future. Finally, one can once again see the dependence between intergenerational commitment and Indigenous perspectives and input. In sum, community engagement and equity are seen to be pursued across all governance scales while intergenerational commitment and Indigenous

perspectives and input are currently confined to large city and regional plans, which may be skewed to fit Oceania trends due to only appearing in those plans.

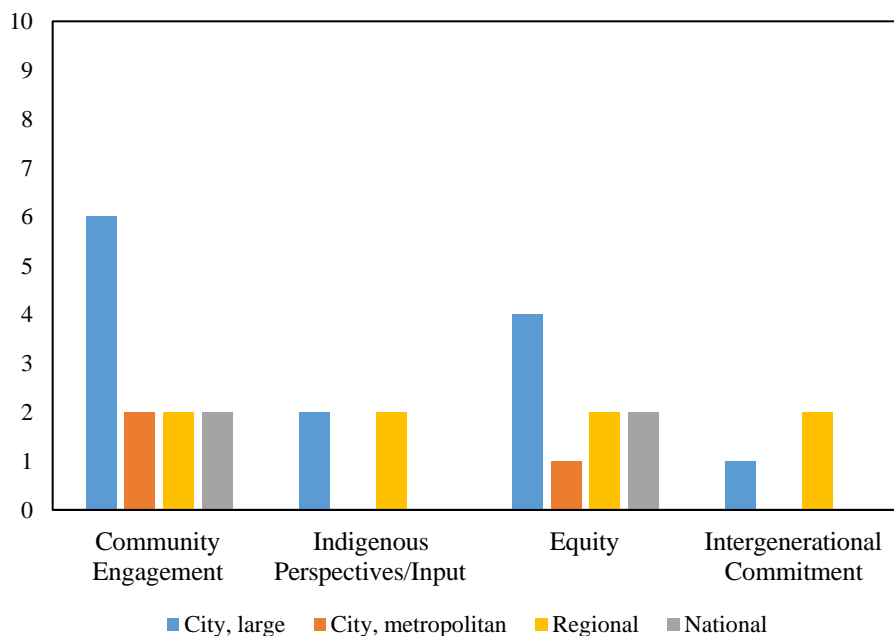


Figure 11. Inclusion of community engagement elements by governance scale.

“Other” Elements

In reviewing the twenty-two plans featured in the domain, a select few elements could not be accurately associated with any of the five proposed categories explored above. As a result, the remaining three elements were sorted into what is currently referred to as “other” elements. However, those elements belonging to this category should not be regarded as having a lower value, regarding their inclusion in a CAP. The three remaining elements found to be commonly included in CAPs are progress tracking commitments or mechanisms, land use principles, and the inclusion of a plan’s development process. As seen in Figure 12, the most commonly included of these elements is progress tracking, featured in 82% of all reviewed plans, followed by land use

principles, and, finally, the inclusion of a plan's development process. Progress tracking is a critical element that may be undergoing an emergence in the context of inclusion due to attempting to combat the existence of CAPs as untracked documents as well as rise to the calls for accountability among communities and scholars.^{15,17,75} As depicted in Figure 13, progress tracking appears to be independent of governance scale, as it appears in over 50% of all plans for each category as well as being featured in the single state-level plan.

Transitioning to the category's second element, the discussion or proposal of land use principle is found in 64% of all reviewed plans, which was a much higher number than anticipated based on criticism in the existing literature. This is particularly true due to the large number of urban plans included in the review and the fact that large cities have the second-highest frequency of inclusion. Notably, this result is of interest due to the urban, suburban, and rural community types changing the type of land use mechanisms available to planners. Yet, no metropolitan city plans included the element, thus pointing to a disconnect between cities of different sizes. Finally, the last element is the explicit inclusion of a CAP's development process. Occurring in only 23% of all reviewed plans, the inclusion of a, if even brief, development process for the plan not only has the potential to increase the credibility of the plan but also achieve a greater level of transparency between the governing body and the public. There is no apparent trend amongst governance scales for this element's inclusion currently.

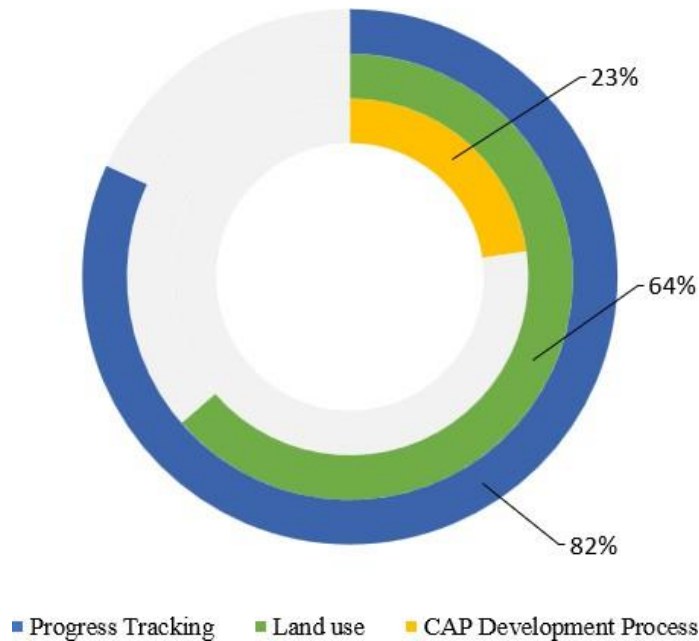


Figure 12. Prevalence of other common elements in sample population plans.

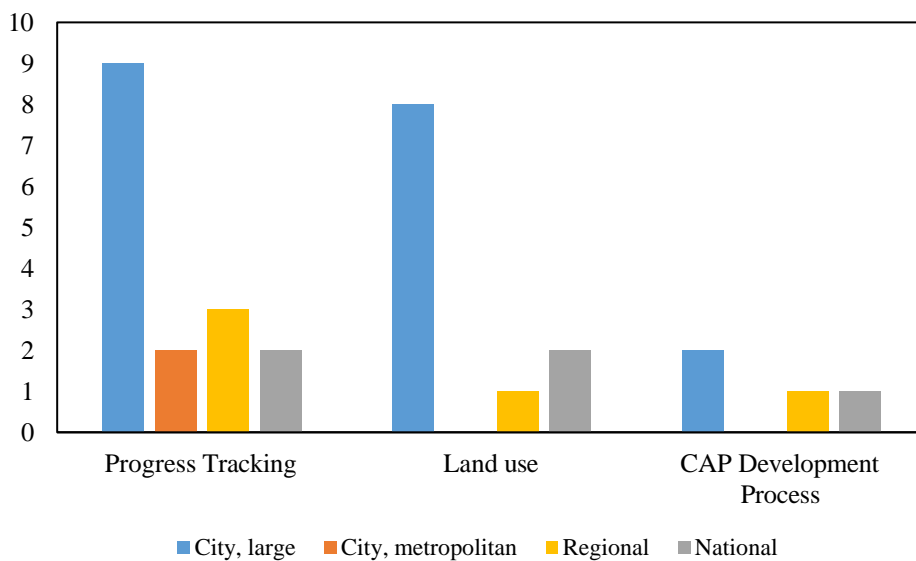


Figure 13. Inclusion of other common engagement elements by governance scale.

As noted throughout this section, there is only so much that reading a document can tell a researcher, government official, or resident. One can take note of the inclusion of elements from

each category and check the progress made on commitments through independent research, but one cannot know what occurred in the room when the plan was created unless they were present. This is particularly true for elements belonging to the community engagement section. Acknowledging the limitations that these secondary sources impose, the fifth section features the results of place-based research conducted in Aotearoa in the spring of 2024 and includes information from primary sources on the CAP development process there.

Chapter 4

Importance of Community Engagement in Effective Planning

As many in the environmental and justice spaces know, global climate change has already and is currently projected to inflict disproportionate harm and perpetuate existing historical systems of injustice.⁷⁶ Whether discussing disproportionate unclean air exposure and associated health issues, increasing rates of climate refugees, or heightened extreme temperature exposure, BIPOC populations, developing countries, and LGBTQIA⁺ communities, among many others, are bearing the brunt of impacts from decisions made by developed nations and those with privileged identities.^{71,75,77,78} In recent years, this reality has been coined as the “triple injustice” which defines the reality of “those who contribute to climate change the least are positioned to suffer the most from its (social, economic, and environmental) effects.”⁷⁹ The persistence of the triple injustice concept can be seen around the world. For example, Swanson (2023) highlights the reality of lower-income households and racialized communities having a higher probability of living in areas with elevated susceptibility to climate change.¹⁵ On top of this, the same areas “tend to have reduced disaster preparedness and constrained access to environmental and social amenities.”⁷⁶ To properly address community engagement, the following section explores the history of equity and exclusion in climate planning, a specific overview of Indigenous Peoples engagement issues to complement the featured case study, issues in implementation for community engagement, and prescribed actions for moving forward in prioritizing equity and justice.

Equity and Exclusion

In tandem with the aforementioned realities, there have been calls from public and international leadership for community engagement's integration into the CAP development process, due to serving as the primary policy document for addressing local climate action.⁷⁹ This call includes voices from the United Nations Framework Convention on Climate Change, attendees of the 1992 Rio Summit, and the authors of the Bali principles of climate justice.⁷⁹ This call continues to gain momentum as CAPs themselves have been identified as perpetuating the previously mentioned injustices. Supporting this call, critics of climate action plans have cited how, over the past decade, the positive outcomes of climate actions can and even have diverged from focusing on justice, equity, and accessibility, and been redirected to focus on economics.¹⁷ As highlighted earlier, researchers have found that community engagement in municipal planning is still “peripheral”, as engagement has been cited to “largely been focused on informing and consulting... rather than focusing on involving, collaborating, and empowering the public.”^{17,19} As a result of these internalized practices, climate action planning has an undeniable history of sometimes causing “regressive outcomes” that “contribute to new forms of gentrification and displacement.”¹⁷

Looking deeper into the issue of climate action planning's connection to inequity and exclusion, studies of this field and its products have shown that CAPs are restrictive due to often being created by individuals with significant privileges, including formal education in consultation, but that lack community-specific knowledge.¹⁷ The lack of such knowledge translates to gaps existing in plans regarding the histories and needs of community members, which can and has led to the implementation of maladaptive practices.¹⁷ In addition to this, Finn and McCormick

(2011) identified that CAPs and the associated planning process have a trend of “trying to address equity and justice concerns in local government planning systems, but substantive engagement with these concepts in climate action planning is mainly rhetorical.”^{15,18} For example, equity has been a sought-after goal for governments and planners but found to be rarely implemented in verifiable ways within CAPs.¹⁵ Thus, equity and associated language in such plans is deemed by some as being “misleading as an indicator of a city’s progress toward delivering just outcomes.”¹⁵

Exploring the reasoning behind the observed exclusion, several theories have materialized throughout the academic community. However, there appears to be somewhat of a consensus surrounding a lack of a full-picture consideration for systemic issues rooted in social, economic, and racial structures and the associated drivers.¹⁵ This hypothesis has been supported by the persistence of the Western worldview, also known as the Dominant Social Paradigm. Focusing on economic gains above all else, this worldview has been cited as the cause for both limited consideration of these realities and the creation of barriers to engagement.¹⁷ The latter is particularly important to note, as barriers to engagement feed into a positive feedback loop for historically excluded communities. This loop includes barriers to engagement, an absence of continuous follow-up practices, and the worsening of existing mistrust impacting the ability to engage in the pursuit of earnest community engagement.¹⁷

Indigenous Engagement

In setting the tone for the case study featured in the next section, a brief overview of Indigenous engagement in climate action planning is provided. It must be noted that this is just a brief overview of this corner of the issue and is not included to call for the prioritization of only

Indigenous Peoples. Rather, this section is provided to prompt further examinations of privilege, colonialism, and exclusion as it relates to all marginalized communities.

Looking at the history of planning practices, municipal planning has been identified as rooted in colonialist mindsets that were once used to “displace and remove Indigenous peoples.”¹⁷ Despite changes in purpose, particularly in the case of climate action planning, the “mental models” underpinning those historical practices are cited as still being present.¹⁷ As a result of this history in conjunction with a lack of community engagement, among other factors, Indigenous communities around the world have been and still are subject to maladaptive practices.^{17,80} Maladaptive practices, as defined by the International Work Group for Indigenous Affairs, are “adaptation practices that fail to consider adverse outcomes and indeed reinforce inequalities and exposures to risk.”⁸⁰ Due to the lack of inclusion of Indigenous communities, among other marginalized populations, the existing inequities within these communities are aggravated by governments’ lack of participatory planning implementation.⁷⁵ Ultimately, the impact of maladaptive practices is another harm caused by the “checkbox” approach that has been taken by some climate action planners and governments.¹⁷

By omitting populations such as Indigenous communities in the planning process, there is not only a heightened probability for maladaptive practice implementation but also an omission of critical knowledge. This cannot be more appropriately highlighted than by the findings of the International Work Group for Indigenous Affairs report. In the report, Indigenous leaders and community members emphasize that

“Indigenous Peoples’ knowledges and their incorporation into climate action enhance the effectiveness of local adaptation measures, especially in forest contexts. Evidence indicates

that the co-management and community-based management of biodiversity by Indigenous Peoples also supports more equitable, effective and durable adaptation outcomes.”⁸⁰

The meaningful and non-extractive inclusion of such knowledge in collaboration with Indigenous communities can lead to the practice of “Two-Eyed Seeing”, which is a “collaboration and support between two knowledge systems (Indigenous and Western) in a manner that enhances each other.”^{17,81} In light of this information and global discussions around equity and inclusion, the 6th IPCC report called for the increased inclusion of “diverse actors, especially Indigenous Peoples, in climate governance.”⁸⁰ This includes a call to governments and planners to deconstruct the remnants of colonialism in planning practices while simultaneously prioritizing equitable community engagement for all.¹⁷

Implementation Issues

Progressing to investigate implementation, scholars have cited a list of hindrances associated with implementing community engagement in climate action planning. None of the listed issues are an excuse for not working towards equitable and just climate action planning but should be noted as real struggles that require strategic solutions moving forward. Governing over many of these issues is the existence of climate change as a distributed burden requiring accountability from various governance scales. Thus, one of the commonly cited issues in implementing community engagement includes “structural challenges of bureaucracy, administrative and electoral processes, mandates, and departmental silos posing significant barriers when trying to address the equity deficit.”¹⁷ Transitioning to examine regional and city-

specific issues, restrictive mandates enforced by the federal government regarding climate-related actions serve as a key limitation for smaller governments.

As discussed throughout the entirety of this work, capacity challenges are another key issue for such governing bodies.¹⁷ Capacity challenges include time, workforce, fiscal resources, and expertise—all of which have been cited to “impede(s) cross-collaboration and the ability of municipalities to address complex issues.”¹⁷ This fact is further exacerbated by a governing body’s urban versus rural status, with rural governments cited as experiencing more intense limitations.¹⁷ It is to the point that scholars such as Dobai and Riemer (2024) advocate for the reconceptualization of current governance frameworks in order to thoroughly address existing equity issues.¹⁷ However, there is good news in addressing these limitations which lie in the benefits gained from partnerships among governments and organizations.¹⁷ These collaborations have been cited as an “important facilitator in overcoming barriers,” including those specifically associated with community engagement limitations.¹⁷ Thus, the observed high rate of inclusion for partnerships throughout the reviewed CAPs provides hope for the utilization of these relationships to prioritize and pursue equitable community engagement.

Prescribed Steps for Equitably Moving Forward

With the previously provided histories and information in hand, the method for moving forward is still undefined but is promising. Ultimately, the integration of equitable planning grounded in community engagement communities is paramount in all actions starting today and requires the purposeful inclusion of marginalized communities.¹⁵ According to Swanson (2023), this practice requires planners to “accommodate diverse worldviews” and “reconcile differences

between groups arising from these worldviews.”¹⁵ As discussed briefly above, there is proof of the value of knowledge held by climate-vulnerable communities, whether about the specific community’s needs or traditional systems of knowing.¹⁵ Regardless of but accentuated by said value, such populations are deserving of a permanent seat at the table when planning actions will intimately impact their community.¹⁵ Embodying the spirit of intersectionality, such explicit decisions avoid the disregard of multiple existences of inequity.¹⁵ Yet, how to move forward has ultimately remained disjointed due to competing recommended actions. As a result, a Penn State independent research team, including Dr. Peter Buck and Zane Saylor, conducted preliminary research on identifying the most common recommended actions for increasing community engagement. The review yielded three main points of guidance for successful community engagement that operate in tandem with the prioritization of equity and justice.

First, the team determined that governments and planners must engage in early and continuous engagement with their communities.⁸² The team found that early engagement allows for a deeper understanding of a community’s key challenges, as it allows for relationship building and can yield larger pools of collected data from the community.⁸² Among other scholars, early engagement has also been highlighted as positively contributing to the framing of a plan and its contents, which influences how elements are addressed and shapes public perception of the plan.¹⁵ Supported by literature, continuous engagement was identified as the second piece of this portion of the puzzle. Continuous engagement fosters a culture of trust and has the potential to begin to heal systemic mistrust of government held by marginalized as well as rural communities.⁸² Finally, both early and continuous engagement can prevent narrow issue framing and, thus, the “illusion of inclusion.”¹⁵

Second, the team found that the provision of relevant, unbiased climate education opportunities and materials is fundamental to the success of community engagement in climate action planning.⁸² Although knowing how they are personally impacted by it, community members' knowledge regarding climate change's causes and impacts can vary. As a result, local governments must prioritize the provision of educational programming and materials for all community members, regardless of whether citizens choose to participate in the planning process.⁸² Furthermore, the provision of such resources has been found to promote equity in both the planning process as well as the community at large.¹⁵ Zoll (2022) conducted a poll in which the findings found that successful work in achieving equity required multiple factors including "ensuring equal access to resources and services."^{15,83} Finally, the provision of unbiased resources with no attached price tag was found to increase the transparency of the planning process, which is assumed to subsequently build trust between the community and the planning body.⁸²

Third, the team found community engagement requires planners and government officials to work on reducing accessibility barriers for engagement opportunities within the community.⁸² If not clear already, local governments must strive for the highest rate of participation possible with the community, but this requires making sure engagement opportunities are accessible to all. While traditional methods of engagement, such as town hall meetings, are proven to yield results, there are key populations that are unable to participate due to intersecting identities, such as parenthood, being a caregiver, career-related commitments, and financial responsibilities.⁸² As stated in current literature, participatory processes must make "special efforts to engage groups who have been identified as vulnerable" as they tend to disproportionately experience climate change impacts, be excluded, and be exposed to maladaptation.¹⁵ Furthermore, to sufficiently achieve this measure, multiple community engagement methods should be implemented, which

allows planners to account for the previously mentioned intersecting identities.⁸² This could include the implementation of Community Based Participatory Research, public heat mapping apps, and tabling at public events and buildings.⁸²

When developing a CAP, all three of these guidance points should be pursued to equitably include all members of the community in the development process. While these three points do not ensure the achievement of equity or justice nor should they be the only community engagement considerations, they serve as a starting point for communities that want to prioritize justice in climate action planning. It is recommended that a government's staff or planners conduct additional research on community engagement, environmental justice, and equity—both on a conceptual level as well as in the context of their community's history. Based on the findings of this conceptual review, the team had a heightened interest in the community engagement present in CAPs from Aotearoa. As a result, part of the team traveled to Aotearoa to learn more about their planning process, community engagement mechanisms, and the seeming prioritization of equity within the context of their communities.

Chapter 5

A Climate Action Plan Case Study: Northland, Aotearoa

Transitioning to investigate CAPs in a specific region's case, climate planning in Aotearoa, more commonly known as New Zealand, was investigated via a literature review as well as collected primary source information from interviews. Located almost 9,000 miles from State College, Aotearoa is home to 5.123 million people with 20% of the population identifying as Māori. As of 2022, Aotearoa remains in the top ten highest-ranked countries for quality of life and sports a GDP of \$253.47 billion (USD).⁸⁴ The country features a primary industry comprised of forestry and agriculture, with dairy and beef farming being key sectors. Manufacturing is also a strong industry for the country, which is predominantly comprised of the processing of primary industry products.⁸⁵ Finally, the country is well known as a travel destination because of the beautiful coastlines, lush forests, and stunning wildlife. Before exploring the reality of climate action planning, community engagement, and Māori issues, an overview of the history of Aotearoa is necessary to contextualize the subject, highlight the tireless stewardship of the Māori People, and acknowledge the history of colonialization that has led to the country's current state.

History and Background

According to Māori history, the country was created by Māui, the Polynesian demi-god. Legend has it that Māui went fishing in a waka—a traditional boat similar to a canoe—with his brothers and, using his iconic fishhook, fished the North Island out of the ocean.^{86,87} After creating the North Island, the waka Māui and his brothers used became the South Island.^{86,87} While considered to have been established as a country in the late 1800s, Aotearoa has been the home of

Māori people for the past millennium.⁸⁸ According to the people of Ngāpuhi (Far North), Aotearoa was discovered by Kupe, a Polynesian explorer from the South Pacific Island of Hawaiki.⁸⁶ Māori people stewarded the land for almost 700 years before European settlers discovered Aotearoa. On record, the first European to spot the country was Abel Tasman, a Dutch explorer, in 1642.⁸⁸ Despite never stepping foot in the country, Tasman claimed the land for Holland, but, due to being unable to convince the Dutch East India Company to invest in the country, ultimately rescinded the claim and left Aotearoa alone.⁸⁸ The Māori people remained autonomous, but that all changed with the arrival of Captain James Cook in 1769.⁸⁸

Over the next 80 years, Māori had an increasing frequency of interactions with European travelers, particularly through trade, which contributed to an increased interest in the country from the British Monarchy.⁸⁸ In 1840, the Te Tiriti o Waitangi (Treaty of Waitangi) was signed between the British crown and, ultimately, over 500 Māori leaders.^{89,90} There were two documents drafted—one in English and one in Māori.⁸⁹ While it was advertised that both documents were the same, there were explicit differences that have led to the deceit and mistreatment of Māori communities' ancestral land and rights—the impacts of which still affect Māori people today.⁹⁰ As a result of Te Tiriti o Waitangi, the country's governance became one of a constitutional monarchy with a parliamentary system of government.⁸⁹ The country's chief of state is King Charles III, as the country remains part of the crown, and he is represented in the country by a Governor-General, which is currently held by Dame Cindy Kiro. However, the primary ruling position is the head of government known as the Prime Minister, which is currently held by Christopher Luxon.

In addition to knowing the colonial history present, an understanding of Māori relationships is critical, as a firm understanding of their structures and operating scales proves quite important when examining climate action plans across the country. In Māori culture, there are levels of

relationships varying in size, known as iwi, hapū, and whānau. Iwi are the largest groups representing nations of Māori people and are comprised of numerous hapū. Additionally, there are several Rūnanga councils representing hapū within the iwi. Hapū are groups of up to a few hundred people, typically of the same whānau, and have significant political power within the iwi. Finally, there are whānau, which are familial units that range in scale from “nuclear” families to extended families.

Fast forward to the present day, Aotearoa, similar to many other countries, signed the Paris Agreement in 2016, thus committing to submitting an NDC. For their NDC, the country took a point-year target approach based on net emissions using long-term averages of plantation forests’ carbon stock.⁹¹ Aotearoa moved forward with planning efforts with the intention to address both domestic emissions reduction as well as CO₂ removal via land-use strategies.⁹¹ The original NDC for the country featured a commitment to be 30% below the 2005 baseline emissions level by 2030 but was soon updated to be more ambitious, as per the requirements of the Paris Agreement.⁹¹ In October of 2021, the country restructured its NDC and committed to a 50% reduction in emissions compared to the 2005 baseline by 2030.⁹¹ With a committed goal set to approximately 41 Mt CO₂-e, the NDC was drafted such that all economic sectors and all greenhouse gas emissions were considered.⁹¹

At the national level, Aotearoa is scheduled to release its second NDC in 2025, which will include its final adjustments for the 2030 goal. In working to support these goals, significant local climate action planning has been occurring across the two islands. As seen in the previous section, CAPs have been developed for cities and regions including Auckland, Northland, and Te Rūnanga o Ngāi, to name a few. These plans vary in terms of served population sizes, featured sectors, job growth, and targets while displaying uniformity in including projected climate issues, land-use

strategy inclusion, and Indigenous perspectives. After reading the aforementioned plans and observing those differences, it was determined that further research was required to understand the climate action planning process in Aotearoa, as influenced by national and regional trends, culture, and practices. As a result, collaborations were established between Penn State University and Auckland University that allowed for travel to the North Island to collect primary source data on sector prevalence, community engagement, and Māori climate-related issues. All anonymous interviews, for the privacy and safety of the interviewees, featured throughout this section are cited in the bibliography

Sector Analysis: Prevalence and Trends Explained

After completing the sector analysis for the Aotearoa plans, three primary trends stood out: Auckland's seemingly heightened capacity for planning, a disconnect amongst plans for including the water as a focal sector, and a seeming lack of energy sector-related actions. In identifying these trends, members of the Auckland and Northland communities were interviewed, due to their personal ties and professional engagement with the sectors.

To start, the individuals were asked about the potential reasoning behind the trends of inclusion regarding the energy sector, particularly the lack of city-level or regional proposed actions. In working to explain the trend of inclusion, interviewees highlighted that those plans that did include energy, specifically Christchurch and Wellington, are subject to rolling blackouts while other regions are less likely. Note that Christchurch and Wellington's plans were reviewed, but not included in the analysis in section three to not create a disproportionate influence on trends from Oceania plans. Furthermore, Northland and Te Rūnanga o Ngāi are also subject to blackouts,

but have larger sustained issues regarding energy poverty, thus understandably omitting the sector from CAPs. Outside of the energy poverty crisis and black-out occurrences, reviewers attributed the lack of the energy sector's inclusion to the country operating on a nationalized, primarily hydropower system that cities and regions have very little control over. In conjunction with this explanation, interviewees emphasized that the lack of inclusion was not correlated to a lack of concern, but rather due to the sector's operations existing at a much higher level of governance.

Next, interviewees were asked about the disconnect between the inclusion of water as a sector in CAPs. A variety of perspectives were provided regarding the reviewed plans. First, similar to the energy sector, interviewees noted that water tends to be overseen by super councils, thus leading to water responsibilities being located at a higher governance level above the individual city or iwi. This was particularly highlighted in the case of Wellington's water sector due to the region having a high amount of water controlled by a super council. Wellington's water sector has experienced issues with infrastructure that have led to restrictions and altered intercity water diversion patterns, which has led to the attention being directed away from climate-related water issues. Exhibiting a similar shift in focus away from climate-related ties, Christchurch's lack of this sector's inclusion was attributed to the contention between water and farming practices. This is particularly true for the highly permeable Canterbury Plains, which experienced water table impacts due to farming. Conversely, Rūnangas in Northland exhibit a significant inclusion rate of the sector, which is supported by their legal actions against corporations in the pursuit of protecting water and associated resources.

As the final trend, Auckland's comparatively heightened capacity for planning was investigated. Interviewees highlighted the significant scale differences in financing amongst the regional council. This included the reality of money flow into Auckland being substantially large,

due to housing a third of the population and a large portion of manufacturing. Due to differences in financial capacity, one of the interviewees noted the existence of positive feedback loops that ultimately influence topics such as climate action planning. Interviewees shared that this reality trickles down even to the individual element level, such as the inclusion of decarbonization methods. According to interviewees, decarbonization via carbon farming, carbon credits, and carbon financing are popular topics due to Aotearoa being a primary industry country. However, despite the various iwi and regional councils being interested in that avenue, large cities such as Auckland and Christchurch are the only ones featuring decarbonization in CAPs, most likely due to their size and capacity.

Northland Community Engagement and Māori Issues

In working to understand the reality of climate action planning specifically in Northland, various actors were interviewed including Te Rarawa iwi and Pākehā residents of Northland. In Northland, there is an established council responsible for overseeing a variety of functions, including climate action efforts and planning which produced the *Ngā Taumata o Te Moana* and *Te Tai Tokerau Climate Adaptation Strategy* plans. In speaking with an interviewee with previous strong ties to the council, questions regarding capacity, structure, and community engagement in these climate efforts were discussed. The interviewee highlighted that the Northland council is a small organization that has a, subjectively, understaffed environmental team that, in their words, was and still is “stretched quite thin.” This has led to capacity limitations regarding climate action planning, as seen by the existence of a council employee-specific emissions inventory but a lack of an emission inventory for the Northland region, and in community engagement. These capacity

limitations have also translated to a strong, community-wide mistrust of the council and its projects, similar to those held against the Department of Conservation.

In pursuing community engagement with climate-related issues, the Northland Council has implemented several in-person events, created educational materials, and established youth-facing programming. It must be noted that community engagement remains the responsibility of other teams across the council, thus leading to a weaker connection to climate work because of what one interviewee referred to as a “disconnect of information.” For the in-person events, the council has hosted community clean-up events at Hātea awa (Hātea River), tented at the A&P Show and Agricultural Fair, and ran a social media campaign titled “King Tides”, which asked community members to take pictures of the coastline in an effort to map the change in sea level rise. However, with all these events, it was shared that while each improved community visibility, it was still quite difficult to get buy-in from the community. Furthermore, the events were cited to have failed to reach all the populations they should have or needed to, such as those with a lack of existing awareness or with no investment in these issues.

Discussing other opportunities for community engagement, the focus shifted to communication and information availability. The interviewee stated that the Council does not have a primary method for constant communication outside of the website and social media. This means that common options such as mass email blasts or Listservs are not utilized. On the website, the council does advertise opportunities for community feedback on plans and publications such as the Regional Land Transport Plan review and the proposed plan for freshwater management. However, as will be discussed shortly, there is an accessibility equity issue with these listings and sessions. When asked about the popular method of town hall sessions, it was relayed that the council does host town halls, called hui or wānanga, but are “invite only” for council members.

Thus, the town halls serve as more of an inner council workshop instead of a traditional community engagement mechanism.

As the final discussed primary method of community engagement, the council does engage in significant educational programming and material provision efforts. Climate-related educational programming from the council does exist in schools throughout the region and is well received by the youth groups. Outside of the academic institution setting, the council also provides free documentation and educational materials on various topics and issues. However, it was strongly emphasized that this practice, in its current state, is “not equitable due to an educational divide and poverty influences.” It was relayed that there was a lack of community desire to read all the information if it was accessible to them. Furthermore, if community members did read the information, many would be unable to grasp technical concepts due to systemic educational inequities. One interviewee was adamant in highlighting that this was not the fault of the community, but rather a consequence of a variety of intersecting systemic issues.

Homing in on the Māori climate and engagement-related issues, members of Te Rarawa were gracious to answer questions about the trends they are witnessing within their iwi. Te Rarawa takes a four-quadrant approach in addressing issues with the iwi: social, economic, environmental, and cultural. Te Rarawa notes that key issues impacting the iwi include trust between Māori iwi, gumland droughts, Māori poverty, flooding and sea level rise, a lack of baseline studies for efforts, greenwashing, and critical issues with returned Māori land accessibility, stability, and safety. For example, flooding is a prime topic as it relates to attempts to implement diversified land use practices. Viewing the issues through the lens of Indigenous stewards versus a changing model, replanted indigenous species have been consistently damaged by increasingly frequent floods, thus forcing iwi to consider how to best use the land to support the ecosystem and the community.

Furthermore, the indigenous growth forests are also hampered by the national government's refusal to provide sequestration credits for such plots. Thus, it has fallen on the already busy Te Rarawa staff to organize and advocate for options such as blue-green credits.

This is just one of the many examples highlighting the impact of climate change on Indigenous livelihoods and the associated lack of internal capacity due to the sheer number of issues to address, both related and unrelated to climate. After identifying the issues iwi currently faces, the focus shifted to addressing these struggles through climate planning. First and foremost, Te Rarawa has a partnership with the district council of Northland that they expressed existed in good faith but had been lacking in terms of action since 2022. In the context of collaborative engagement, interviewees outside of Te Rarawa noted Māori communities finding it difficult to have the time, funds, and connection-based capacity to establish equitable engagement, including in climate planning.

While there is an existing Māori engagement team operating within the Northland Council, there is no direct connection to climate action. Furthermore, one interviewee expressed that communication with Māori is present, but there is little to no collaboration, thus it feels that much of the inclusion of Māori language and community members in plans is somewhat just “putting a check in the check box”. Another interviewee echoed that sentiment by stating that there is “lots of acknowledgment, but not action.” These behaviors have subsequently been attributed partially to have caused the work being done to not reach those impacted most, many of which are Māori. This was a stark contrast to the high level of apparent Indigenous engagement in the reviewed CAPs, as noted in the CAP framework section of this work. The reality of this disconnect leads to one of the key findings of this body of work, which is that plans themselves are a merely compilation of words. Prolonged, meaningful engagement that is met with sustained actions is

required to truly address the needs of any community, including Māori iwi in Northland as demonstrated by this small study.

Chapter 6

Conclusion: A Guide to the Future of Climate Action Planning

At the end of the day, climate action planning is a somewhat established practice that is experiencing a rapid period of growth. Subsequently, a variety of methodologies have emerged leading to a lack of consistency throughout the field and the absence of an accepted CAP development framework. While each CAP must be unique to best fit the needs of an individual community, the basic elements defining a successful CAP have yet to be collectively agreed upon. As a result, a review of over twenty CAPs worked towards filling in that gap by determining trends in element inclusion based on continental region and governance scale. Based on the results of the review, several recommendations can be made to local governments, communities, and planners interested in beginning the climate action planning process.

First, a greenhouse gas emissions inventory was found to be fundamental to current CAPs, as it was one of the most included elements across all reviewed elements in all categories. Further supporting this element's importance in CAPs, there are several elements identified as utilizing the results of such an inventory, including all other key metrics, certain non-governmental partnerships, projected climate risks, and decarbonization plans. In concluding the review of the key metric category of elements, large cities appeared to have the greatest tendency to include such elements, which is expected to be due to resource capacity and population size.

Next, for collaboration mechanisms, it was found that governmental and non-governmental partnerships are key elements, particularly in African and Asian countries as well as the United States. These partnerships are highly supportive of climate planning efforts in providing baseline frameworks, access to planning tools, and a community for support—specifically C40 and ICLEI. There is also the existence of “other” elements, which include progress tracking commitments and documentation of the development process. Despite being up-and-coming elements, both elements are crucial for transparency and accountability, as they address existing prominent criticisms of climate action planning. Thus, it is the

recommendation of this work that all the “other” elements, including land use principles despite not gaining much insight into the element, must increase in frequency of implementation.

Moving to the largest section of elements, a sector analysis yielded a uniform agreement on the inclusion of the following sectors: Built environment and Infrastructure, Energy and Industry, Waste, and Health. Thus, future climate action plans should examine their community’s connection to and impact on these sectors, based on the observed uniformity. Conversely, there was a comparative lack of agreement on the inclusion of agriculture and food, economics, and the environment itself. Despite the apparent lack of convergence surrounding these sectors’ inclusion rates, this is not highlighted to advocate for their omission, but, rather, to highlight other regions that are focusing on them to bring attention to their importance. Transitioning to global projection and insight tools, projected climate risks were found to be the most commonly included tool utilized to provide insight to the public. The analysis also yielded inklings of the emergence of decarbonization plans and workforce projects as preferable elements to include in CAPs. This indicates the acknowledgment of the intersecting benefits between CAPs and other sectors such as transportation, the built environment, and the economy. Thus, both elements are recommended for larger future implementation amongst plans.

Finally, looking toward the key practice of community engagement, the element only contributed to 59% of all reviewed plans despite being the most common within the community category. Due to limited application, the possibility for maladaptation, the persistence of systemic injustices, and the deepening of distrust between the community and the government as well as planners is high. As seen in the Aotearoa interviews, even when community engagement is included in a plan, there is the harsh possibility of community engagement without meaningful implementation occurring. The harm caused by such practices is palpable to these communities, thus there must be a greater level of monitoring, transparency, and commitment from governing bodies creating plans. Finally, community engagement and equity are most significantly seen at the large city, metropolitan city, and regional scale, thus indicating an elevated level of capacity in this realm.

Ultimately, it is the recommendation of this body of work that community engagement and equity should be prioritized to correct the persistent injustices enforced by harmful planning processes. There are a variety of mechanisms to earnestly guide and lead community engagement efforts, which should be tailored to the circumstances an individual community is facing. However, as a generalized set of best practices to be applied to chosen engagement mechanisms, it is recommended that planners follow the three principles outlined in the community engagement section, which are early and continuous engagement, working to decrease barriers to access, and the provision of educational materials and opportunities. In addition to these suggestions, planners and governments must participate earnestly in collaboration to amplify other ways of knowing, which include BIPOC, community, and oral knowledge systems.

As climate action planning continues to proliferate due to countries working towards meeting personal NDCs and the global Paris target, it has been demonstrated that there is convergence around various commonly included elements. Yet, it is also discerned that the practice of climate action planning requires significant development and structural changes to ensure equitable and just results. Climate action planning should not be seen as a tool available for only large governments or communities that are flush with capacity, but rather for all that are concerned for the well-being of people, place, and the planet. As one undertakes the challenge of developing a CAP, take stock of the key elements present in common practice right now and how the community connects to each, as there may be many connections present never before realized. With environmental justice at its core, climate action planning is for all, and, when used properly, elevates the voices and needs of historically, disproportionately impacted populations that truly deserve better.

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