

**Centrality and Compliance: Unitary vs. Federalist Political Systems in the Implementation
of the Kyoto Protocol in Argentina and Uruguay**

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List of Abbreviations

CDR: Common but differentiated responsibilities

COP: Conference of the Parties

GDP: Gross domestic product

GHG: Greenhouse gases

IEA: International environmental agreement

MVOTMA: Ministry of Housing, Land Planning, and Environment

NATO: North Atlantic Treaty Organization

UNFCCC: United Nations Framework Convention on Climate Change

Abstract

When Uruguay and Argentina first gained their respective independence in the early 1800s, they appeared to be following the same path of development. As countries that came from the same Spanish colonization, share almost identical agricultural economies, and retain a close relationship, it is logical that they would follow similar trajectories. This assumption proves to be inaccurate in more ways than one, but most prominently within the environmental sphere. One way to analyze this difference in policy implementation lies in compliance with international environmental treaties which contain specific goals and limits for all parties involved. The Kyoto Protocol presents a prime opportunity for analysis of compliance between the two countries by examining their emissions as compared to their original targets. Uruguay has demonstrated a superior commitment to Argentina in meeting emissions targets. To account for this discrepancy, a combination of political, economic, and historical factors was considered. The most influential difference out of these variables remains in contrast to Uruguay's political centrality – Uruguay has a little over 1 million fewer square miles than Argentina. Wielding control and gaining consensus on any national policy has historically been easier for Uruguay, making a nationwide effort easier to accomplish. This politics of this centrality feature has offered the most significant explanation to account for the vast difference in compliance with the Kyoto Protocol when compared to its neighboring country of Argentina.

1. Introduction

The onset of the climate crisis has given rise to various attempts at international collaboration intended to combat what is a fundamentally interlinked problem. To face the worldwide threat of ecosystem degradation that affects everyone, international environmental agreements have been committed to posing a global attempt at environmental mitigation. While these agreements often have ambitious goals, more often than not, the outcomes have been disappointing. Many will assign blame on the division of responsibility between participating parties as not all nations produce the same outcomes. Some nations are placed in a better position to ensure compliance while others struggle to balance their development with the integration of sustainable practices. In the short run, complying with international environmental agreements almost always requires a significant financial investment that can hamper development.

The first IEA to propose a comprehensive effort in combating climate change was signed nearly unanimously in 1997. Named the Kyoto Protocol, this IEA fell under the jurisdiction of the United Nations Convention on Climate Change (UNFCCC). It is intended to reduce greenhouse gas emissions from all participating parties. While a seemingly straightforward goal, the Kyoto Protocol contained nuanced conditions that accounted for the abilities of all nations in different stages of development. Less developed countries still in the process of growing their economies were given nonbinding commitments that heavily relied on self-accountability while more developed countries were bound to binding agreements to limit their greenhouse gas emissions. Examining the successes and failures of compliance with these non-binding commitments is a key factor in understanding the realization of the lofty goals in the Kyoto Protocol, and possibly to IEAs as a whole.

Contemporary literature on international environmental agreements is largely in the agreement with the overall failure of IEAs to accomplish stated goals (Kellenburg and Levinson 2014). Reversing a centuries-long trend of environmental degradation within the context of global growth poses a difficulty that no one has been able to solve, even with international collaboration. So far, the best response is one of global cooperation – natural resource degradation, pollution, and global warming knows no national boundaries. Without some kind of all-encompassing effort to fight this battle, any progress made could be offset by other countries. Although the idea of international cooperation contains its fair share of complications and uncertainties, it is the only tool we have.

Within the idea of international cooperation, the roles and capabilities of less developed countries continue to pose one of the most challenging disputes. Discussions over common but differentiated responsibilities and levels of obligations of participating countries continue to guide the dialogue of IEAs. While the idea behind CDR is a benevolent one, its non-binding and laxer characteristics can give way to noncompliance and a noncommittal attitude within countries. Understanding the factors that contribute to this variation in compliance has the potential to guide future international environmental agreements and their methods for enforcing compliance in less developed countries. Consecutive IEAs follow the same formula in that it differentiates between different levels of development within parties and doles out responsibilities as such. This issue of compliance with more vague and non-binding commitments will continue to be a significant problem for the success of IEAs.

While comprehensive studies on this topic pose logistical challenges, comparisons on a small scale can provide valuable insights into this issue. The two neighboring countries of Uruguay and Argentina share comparable political and historical characteristics but wildly

different approaches to environmental policy outcomes. Uruguay and Argentina are both countries that share the same political origin from Spanish settlement and similar economic and political trends, making them a great case study to analyze crucial characteristics that affect the implementation of the Kyoto Protocol. But while both countries demonstrate many matching attributes, Uruguay is now running on 98% renewable energy while Argentina consistently ranks at the bottom of climate performance metrics (Hall 2023 and Argentina Climate Performance Ranking 2023). What accounts for this wide disparity in environmental performance?

2. International Environmental Conventions in Uruguay and Argentina

2.1 The Kyoto Protocol

Adopted in 1997, represents the culmination of decades of increasing attention on the role of greenhouse gas in climate change. Operationalized under the United Nations Framework Convention on Climate Change, the Kyoto Protocol represents an ever-increasing trend of globalization and international collaboration on climate change. This commitment posed a stark change to agreements that came before by binding parties to the targets set. This binding feature only applies to developed countries that carry more of the financial burden and a higher commitment than less developed signatory countries. The first period of commitment lasted from 2008-2012 in which 37 developed countries committed to reduce their emissions by 5% on average (United Nations Climate Change). Within this time, countries were required to demonstrate their compliance with the Protocol and their reduction in emissions. There are two groups of countries that dictate their level of commitment to the protocol: Annex I countries include 'developed countries' and Non-Annex I countries include 'developing countries'. Only Annex I countries are bound to adhere to their emission reduction targets, while for Non-Annex I countries the reduction is voluntary.

1. Historical Background of the Two Nations

3.1 Historical ties between Argentina and Uruguay

The past and present histories of Uruguay and Argentina are fundamentally intertwined with one another. Geographically, the countries inhabit adjacent latitudinal areas and climates. This results in similar natural resources and models of natural resource exploitation that have created two economies both reliant on similar agricultural markets. Politically, the two modern countries come from almost identical origins of Portuguese and Spanish colonization that combined the regions into one royal viceroy, eventually creating the modern South American countries known today. Culturally, the proximity of both countries has resulted in strong cultural and political ties that have affected and will continue to affect modern-day relations. The connections between Uruguay and Argentina are not limited to just their geographical proximity – the long-established ties are the result of centuries of intertwined history.

These ties go back to the era of Spanish and Portuguese colonization, which eventually placed modern-day Uruguay and Argentina under the same Spanish rule. The region that contained both countries was called the Viceroyalty of the Río de la Plata, extending from the lowest tip of South America up to present-day Bolivia (Brown 2003). The Viceroyalty roughly claimed the territories of the present-day countries: Argentina, Uruguay, Paraguay, Chile, and Bolivia. Stationed on the estuary Rio de la Plata that flows into the Atlantic Ocean, Buenos Aires was deemed the Viceroyalty's capital. Buenos Aires contained a massive hub for trade with its port used for the trade network between the South American continent and European powers. Because of the city's position within this growing trade network, it was chosen as the capital of the Viceroyalty and retained significant importance within its political and economic structure.

Because of this dependence on Buenos Aires as the capital, division and disagreement over the region's centralization would eventually cause discord within the populace (Lewis 2015).

This discord manifested itself through coups and revolutions within the already weak government; debates over centralization led to divides between the 'Unitarios' and Federalists since the beginning of Argentina's independence from Spain in 1816. The newly established nation of the United Provinces of the Rio de la Plata was plagued by factionalism that constantly destabilized the acting government. These two parties struggled for power, undergoing multiple triumvirates, dictatorships, and regime changes until the constitution of 1852 (Lewis 2015).

3.2 Independence of the two nations

Just as the citizens in present-day Argentina fought over the role of Buenos Aires in the United Provinces of the Río de la Plata, Uruguay also rejected the centralist approach. While forces within the United Provinces were also engaged in debates on the role of centralization, it became Uruguay's main basis for independence from the United Provinces. Uruguay fully gained its independence as a state in 1830 after years of conflict with its creation of the Constitution of 1830 (Benvenuto 1967). Similar to the Unitarios and Federalists in Argentina, Uruguay experienced its two-party split based on the support of centralization within its newly formed government. The Colorados, defined by liberal and urban tendencies, clashed with the more conservative Blanco party that supported a federalist approach (Weinstein 1998).

Both Uruguay and Argentina are characterized by arguments over the governmental structure concerning unitarian/federalist approaches in their political origins. Uruguay broke away from the United Provinces to reject the political preoccupation with Buenos Aires, while factions within Argentina experienced years of strife over the same concept. This history of

division defined by approaches to federalism and centralization is evident today, constantly shaping modern political realities.

3.3 Argentinian political history

Unsurprisingly, arguments over the centralization of Argentina and its economic powerhouse of Buenos Aires continued to influence its political history. Racked by perpetual political turnover between unitarians and federalists, the new nation's contrasting ideals came to a head in 1820. After the failure of the Congreso de Tucuman, a former member of the failed 1811 triumvirate named Bernardino Rivadavia assumed power. A well-traveled man with outwardly European idealism Rivadavia set out to "modernize" the country. Espousing unitarianism, the supposed "first president" of the United Provinces embodied liberalism by enacting reforms such as free trade, the separation of church and state, improvements in the education system, and more (Shumway 1991).

Rivadavia is considered by many to have influenced the political foundation of the Argentinian political system through these wide-sweeping reforms, positioning the country within the liberal European ideals of the Enlightenment era (Lewis 2015). Throughout the political turmoil that plagued Argentina throughout its early history, these political ideologies remained. Although these reforms jumpstarted the beginning of Argentina's democracy, Rivadavia's tenure did nothing to alleviate the arguments over centralization. Imposing the view of strong unitarianism, he was often claimed to have authoritarian characteristics (Goebel 2011). Although Rivadavia established this strong liberalist government, his unitarian beliefs did not hold past his presidency.

Once again, the turmoil over the country's centralization affected the political stability of the provinces. Juan Manuel de Rosas rapidly rose through the ranks of the military and quickly

solidified his Federalist support throughout the provinces. Assuming control over the United Provinces, Rosas renamed the region the Confederation of the Rio de la Plata as an acknowledgment of its federalist stance. Rosas transformed into a tyrannical leader of the ‘Confederation’, implementing unpopular tariffs and silencing any dissent. Before long, enemies of the current president surfaced to strike. Once again, present-day Argentina fell into political unrest.

From 1852 to 1854, Argentina experienced the secession of Buenos Aires and the establishment of a new constitution. The Confederation continued without Buenos Aires, while crippled by the absence of the city. In 1862 Bartolome Mitre assumed power with the support of a newly amended constitution. Known as the Argentinian Republic’s first president, he set out to advance the country through a Unitarian approach (Lewis 2015). Although he strengthened the economy and united the provinces into one republic, his Unitarian tendencies were replaced by a new administration headed by Nicholas Avellaneda of Tucuman. Under his presidency, the city of Buenos Aires was federalized and “symbolically ended the dominance of Buenos Aires over the national government” (Lewis 2015). The country of Argentina finally experienced a permanent dominance of the federalist approach after decades of infighting. With this stability, Argentina will continue to grow into an economic and political powerhouse on the world stage.

3.4 Uruguayan political history

Uruguay’s beginnings were characterized by a similar approach to federalism. Given that their defining reason to claim independence from the United Provinces of the Rio de la Plata stemmed from their centralization, the early beginnings of the Banda Oriental centered around their approach to federalism/unitarianism. An up-and-coming leader from the rural areas of the Banda Oriental, named José Gervasio Artigas, would spearhead the movement to break away

from the United Provinces in search of a federalized approach. This would allow the newly established country to prioritize their agrarian regions that had been ignored through the Spaniard's emphasis on the port cities of Montevideo and Buenos Aires. Through Artigas' leadership throughout the 1810s, the Banda Oriental region began its independence movement.

The legacy of Artigas is best understood through his political party named the Federal League which "constitutes only the first chapter of federalism's long and varied history in the Rio de la Plata region" (Katra 2017). While this league was able to unite the tenuous provinces within the Banda Oriental and break away from the rule of the United Provinces, it also presented significant weaknesses. The decentralization of administrative tasks meant that localized authorities were tasked with governing their respective regions – this often manifested in cementing the rule of the elite within their provinces. While Artigas ostensibly intended to empower the rural regions and reframe the priorities of the government, it often meant that the power of the established elite was prioritized over that of the local population.

Facing the threats of incessant war between the Portuguese and Brazil, a declining economy, and political infighting, Artigas eventually had to retreat and relinquish his power. Consequently, the Federal League lost its dominance and Uruguay would experience constant battles between centralist and federalist forces for decades. During the turbulence thereafter, the two parties divided themselves into groups: the *blanco* party for the Federalists commonly confined to the rural elements, and the *colorado* party for the liberal, urban unitarians. Although they reached an agreement in 1872 through the Paz de Abril, this partisan divide would continue to affect Uruguay for the rest of its political history.

Although handicapped by this sense of partisanship, Uruguay took a unique route to mollify its effects. Labeled 'coparticipacion', this concept relied on the notion that "the two

traditional parties had an inherent right to divide and share the process and product of government and governmental activities” (Weinstein 1988). This idea would create the foundation of political culture and administration, with the government ensuring that both parties would receive comparable voices and influence. In its early history, coparticipacion was defined as the sharing of territories between both political parties. This method allotted a proportional quota of representation in authoritative positions, preventing the majority from claiming all seats of power. In later years, this ideology would shift with the changing country. The foundation of co-participation in the contemporary sense was largely credited to Jose Battle, a president whose visions would come to shape the future of Uruguay.

At the turn of the century, Uruguay was facing a crossroads: whether the country was “becoming the most advanced democracy in Latin America or a dictatorship hidden by the window dressing of a plural executive” (Vanger 2010). Battle’s run for the presidency came at a time in Uruguay’s history in which political rest and authoritarian tendencies ruled. Just like the early history of Argentina, Uruguay had been struggling with centralist and unitarian partisanship and intermittent periods of authoritarian tendencies. The back and forth of Uruguay’s political structure had taken a toll on the country’s stability, and Battle’s tenure instituted a political model that is considered to be the foundational model for the country (Yaffe 2000). His social and political reforms implemented provided a structural basis for the country’s future.

The “Batllismo Model” is most notable for its political reforms instituted within the constitution itself. Battle himself was an avid political scientist, writing numerous essays and taking on Uruguay’s political system as an “experiment”. Through this mindset, Battle was able to implement a pluralist system in the country through his “Colegiado” system – intending to encourage co-participation and bipartisanship in the country, this system would appoint

departmental *juntas* in each province that had veto power (Vanger 2010). These paid positions would represent the province's ideals more accurately by appointing local leaders who would hold political power over the legislature. Even though this system did not outlast the constitutional reforms of the 1960s, its approaches towards co-participation guided the Uruguayan government since the early 20th century.

More than political institutions, Batlle cemented a social justice agenda into the very fabric of the country's government (Spektorowski 2000). He pursued a worker-focused agenda that prioritized labor rights and the people's interests over that of the elite. In the late 1890s, the working class was threatened by new wealth in the hands of the elites but did not achieve reform in the current government. Batlle's "response was to elevate the state, and therefore the political system, into a form of a benevolent neutrality which would allow it to deny the reality of class conflict" (Finch 1981). The most significant and long-lasting changes made during Batlle's time included but were not limited to an eight-hour workday, economic protectionism to fend off economic imperialism, universal suffrage, free high school education, and an improvement in working conditions. The ideology of Batllismo was essential for crafting Uruguay into the nation it is today.

3.5 Post-independence economy

From the start, Uruguay and Argentina have displayed similar economic histories. Under the Spanish viceroyalty, both countries were dominated by the same government that dictated which industries to pursue. In the case of the Spaniards in the 1700s, this industry was mainly cattle production. In its infancy, this meant that the products were exported to the countries of Brazil, Great Britain, and Cuba (Sawyers 1996). Being geographical neighbors, their climates were almost identical in what they could achieve agriculturally. Fertile lands, a temperate

climate, and proficient grazing lands set up both economies for success in livestock raising. This natural endowment, combined with a reliance on the two neighboring ports of Montevideo and Buenos Aires supported cattle raising in the two countries and contributed to their export-based economies. This export-based economy is what led to “sizable export-driven growth despite the country’s geographic isolation from key international markets” (Spruk 2019). Even though the region remained geographically far from the European markets that dominated their economic development, the two countries were still able to maintain an export-driven economy to spur development.

Despite their origins as essentially single-product economies, the two countries experienced periods of diversification and growth after their independence. Before their process of independence, tariffs limited the capacity of foreign goods to produce any significant profits and limited growth potential. With the end of the Napoleonic wars and the departure of colonial powers, foreign exports skyrocketed (Paolera and Taylor 2003). With the ability to outsource their commerce, Uruguay and Argentina launched into a period of economic expansion. With the flexibility that greater profits allowed, both countries were able to overcome their single-staple trap of relying on livestock. With access to fertile lands and greater export opportunities, the growth of cereal crops became vital for the economies of both countries. Cereals such as barley and wheat constituted a great portion of the economy and catapulted both countries into a period of relative prosperity.

This growth faced a few setbacks in the 1800s, but it was able to maintain its position on the world stage. The export-driven economies of Uruguay and Argentina allowed the countries to industrialize and provide stability to their citizens at a time when other former colonies were not faring as well. GDP per capita was rising dramatically – from 1880 to 1890, revenue more than

doubled in Uruguay (Hanson 1938). In Argentina, the country saw a 3.5% increase in exports per capita from 1810-1870 (Paolera and Taylor 2003). By utilizing their natural endowments and exploiting their potential for an export-based economy, these two countries were able to enter into a post-independence 'golden age'. This sudden economic prosperity surprised even more developed countries, who came to regard Uruguay and Argentina as up-and-coming nations from South America. But while this sudden growth seemed unstoppable during the 19th century, it proved to be an unsustainable trend.

3.6 Crafting Import Substitution Policies to Promote Development

Although the sudden growth of the economy was efficient in industrializing its agricultural market and the infrastructure necessary to support this industry, not much investment was committed to any other development. Frustrated by this lack of diversity and industrialization of the economy, shifts towards an import-substitution approach manifested in both countries. In Argentina, this change was spearheaded by labor-rights activists after the Great Depression. Although GDP per capita presented a favorable view of Argentinian conditions, this metric does not tell the whole story. The economy fared relatively well post-Depression, with the volume of export production remaining at pre-Depression levels (Bergquist 2010). Recovery from the Depression was due in part to the work of labor activists who championed the growth of industry diversification within the country. Faced with currency devaluation and steep tariffs imposed by struggling European countries, Argentina turned inward to develop a domestic economy.

These efforts proved to be effective, and by 1945 the internal manufacturing sector constituted one-fourth of the economy – a number that overtook the agricultural and livestock sector (Bergquist 2010). Turning away from an agriculture-heavy economy, Argentina's exports

significantly slowed while the focus was turned more toward domestic development. A logical continuation of the philosophy of import substitution, this process nonetheless resulted in questionable results still debated by economists (Debowicz and Segal 2014). This application of import substitution, while improving industrial development, was followed by a stagnating economy starting around 1920.

In Uruguay, this trend towards import substitution occurred earlier. Workers were calling for import tariff measures as early as 1875 (Hanson 1976). These debates resulted in tariffs being implemented by 1888, much earlier than Argentina's. This "peak structural change" brought about a culture of import substitution that emphasized the prioritization of domestic production and manufacturing. In 1880, this change created a sharp increase in production with a 50% increase in gross domestic product per capita (Román and Henry Willebald 2021). Accounting for various reversals, the Uruguayan GDP has seen a long-run increase and has almost doubled since 1870. Notwithstanding the increase, this growth pales in comparison to other developing countries; compared to Mexico's quadruple and Venezuela, Colombia, and Chile's trifold economic growth, Uruguay shows a lagging economy in comparison to its neighbors (Glaeser et al., 2018).

3.7 Towards a Neoliberal Economy

The structural shift away from the protectionist policies of import substitution in both countries was followed by questionable results. Although the policies were intended to expand the economy through a relaxing of tariffs, imports, and a revitalization of the export-based agricultural sector, these measures did not spur the same levels of growth as the turn of the 20th century. This phenomenon shared by the two countries does not follow the opinion of the academic field, which has postulated that economic integration and import substitution

industrialization policy are beneficial in the short run, while the liberalization of economies is best enacted in the long run (Adewale 2017). Through this method of short-run ISI policy and long-run economic liberalization, it is shown to have encouraged economic domestic development while still promoting the economic expansion of foreign engagement. The economies of both Uruguay and Argentina have not followed this trend, leaving many to question the reasons why.

One hypothesis focuses on the concentration of wealth in Uruguay and Argentina and its effects on the countries' abilities to industrialize. Similar to many other Latin American countries navigating an independent economy post-independence, Argentina and Uruguay's economies were dictated by those wielding power – in their cases, this would include whoever controlled agricultural production. The former region of the provinces of the Río de la Plata remained concentrated in the hands of a handful of industrialists in control of agriculturally productive lands, leaving the wealth distributed among the lucky few. Many have hypothesized that this dynamic left both Argentina and Uruguay with underdeveloped institutions, therefore leaving the nations with stunted human capital and the ability to handle complex production development (Glaeser et al., 2018). While the numbers showing the productivity and wealth-benefitting industries in both countries suggested prosperity, this prosperity was only limited to a subset of the population. The results of this phenomenon created a population without the ability to invest in the manufacturing sector, subsequently restricting both countries' ability to explore industrialization. Whereas other burgeoning economies such as New Zealand or the United States found success through distributing land and wealth among the settler population, Uruguay and Argentina were handicapped by their populations' lack of economic mobility (Álvarez et al., 2011).

Another hypothesis covers the drawbacks of maintaining an economy controlled by a handful of products. Exerting so much pressure on the environment through over-reliance on cereals and livestock for too long can exhaust the soil, leaving the environment unable to maintain product volume at the same rate as before. Since both countries relied almost entirely on a handful of staples to propel their economies, any decrease in productivity would prove to be costly for the countries. The lackluster performance of the economies of Uruguay and Argentina could be attributed to this hypothesized failure of their single staples, explaining why countries with strong starts could fall so far behind. While there is a branch of scholars who think that “the growth of population exceeded the growth of the stock of exploited land”, this train of thought has been widely discredited (Debowicz and Segal 2014). Although the region did not experience the technological advancements seen by others, the vast area of land was still able to support enough cropland to provide economic growth.

What’s more, the later transition into soybean farming in the 2010s has alleviated environmental pressure from the soil that had supported previous monocultures. A study on the environmental practices of South American agriculture has shown that the current state of the soil quality in the industries of Uruguay and Argentina is sufficient to support the current rate of growth. Soil exhaustion is not a singular explanation for the lackluster performances of both countries’ economies on the world stage, but it will pose an issue in the future (Wingeyer et al., 2015).

While there has not been an agreed-upon conclusion to explain the outcomes of the economic trajectories of both countries, many factors are known to have contributed to the countries’ disappointing performance on the world stage: disproportionate control of land from a handful of stakeholders, stunted industrialization, and lack of specialization. The unsteady

transition to an import substitution model was not fleshed out enough to produce the foundation needed to revert to a single-staple economy, made less effective with a higher concentration of land ownership. Going forward, this trend of relying on exports of singular agricultural staples will prove to be problematic for sustainable development.

2. Designation of Federal/Unitary Status

4.1 Definition of a centralized/non-centralized state

One of the most important distinctions to make when analyzing a country's political system is its approach to the division of power. How a state allocates its authority throughout its government varies highly depending on its size, political philosophy, and contestation between social groups. Determining this allocation of power has historically caused controversy and internal disputes – to study the magnitude of this issue, one need not look further than the American Civil War or the War of Independence itself. The amount of power individual regions wield in terms of their governance directly determines a country's direction. These differences in power balances can manifest in many different ways, both seen and unseen, that can explain the causes of political phenomena. When studied, this idea can lend itself to numerous insights.

As stated in the first portion, the early histories of Uruguay and Argentina were defined by their respective approaches to federalism. After gaining their independence from Spain, the newly formed United Provinces of the Rio de la Plata was dominated by debates over their approach to centralization. As the center of the provinces, Buenos Aires was constantly criticized for maintaining decision-making power over the vast region of the provinces. This power of Buenos Aires as the decision maker was the reason modern-day Uruguay split from the provinces in 1830, instead deciding to focus their efforts on the smaller area that constituted the region (Lewis 2015). And yet this was hardly the end of debates over what level of government

maintained the main share of power in both Argentina and Uruguay, both of whom had their respective political parties that represented different approaches. From the start, contestation over unitary and federalist governments was the basis of the two countries development.

Defining the differences between unitary and federalist states are intentionally vague to allow for state-by-state variation. No two countries follow the same governance structure and each has its approach to division of power. The NATO Advanced Science Institute Committee defines a unitary system as one in which “some single center of authority exercises the ultimate prerogatives of government” while a federal system is one that “authority to govern is divided between a national government and regional instrumentalities of government such as states, provinces, cantons or Länder” (Hanf and Koonen 1985). Each type can come in different forms for each country, whether it be methods of passing constitutional amendments, relegating the passage of laws to various levels of the state, or which state level has the authority to override laws. Therefore, there is no decisive method of objectively distinguishing between federal and unitary states but with a guiding philosophy of where the power is concentrated assumptions can be made with certainty. Determining whether the power is located in a country’s government is made possible through an examination of a governmental balance of power taking into account governmental systems present in the country.

While there is no standardized measure of governmental centrality, certain attributes can be defined that delineate this political characteristic. In the paper “Decentralization and Human Development in Argentina” in the *Journal of Human Development*, authors Nadir Habibi and Cindy Huang, et al. separate these characteristics into three categories: deconcentration, delegation, and devolution (Habibi, Huang, et al. 2003). Deconcentration deals with the dispersion of federal responsibilities to local bodies in a way that local officials still must defer to

central power, which is a common phenomenon found in unitary states. Delegation refers to the apportioning of predetermined responsibilities to local governments, all under the specific instructions detailed by federal bodies. Delegation often occurs with taxation power handed off to local authorities under the authority of the federal government. Lastly, devolution is defined as the relinquishing of both fiscal and decision-making authority to local bodies. Devolution represents the opposite of deconcentration and delegation in that local authorities claim full responsibility for these decisions without the jurisdiction of federal authorities. For this thesis, I will separate the interpretation of a unitary and federal state into approaches to local decision-making and fiscal responsibility.

4.2 Uruguayan unitarianism

After breaking away from the United Provinces to create their own independent country, Uruguay experienced a struggle between those who wanted a federalist approach and those who wanted a unitarian approach. This political struggle mirrored that of both the United Provinces and Argentina in its independence movement. At its inception, the dominant political party the Blancos strived for a decentralized state under President Artigas that empowered its vast agrarian regions. After this approach failed, a new model of state reform occurred under President Battle who implemented various social reforms under the purview of the national government, as well as nationalizing various national monopolies. Although Battle also implemented local departmental heads in each province that had veto power, the local authority was still deferential to the stronger central government.

With this foundation in institutional and national superiority, modern Uruguay demonstrates a unitarian state structure. The United Nations Economic Commission for Latin America and the Caribbean states in its country profile that Uruguay is identified as a unitary

state (CEPAL, n.d.). Although as previously mentioned there is no widely agreed-upon classification for unitary and federalist states, international bodies like the United Nations confer classifications based on the best interpretation they can infer. Rather than subdividing the country into semi-autonomous states or provinces, Uruguay's various regions are divided into nineteen departamentos or departments. Led by mayors and departmental boards, these departamentos are more similar to municipalities than state governments.

The Uruguayan constitution grants its departments few responsibilities in comparison to other federalist governments such as Argentina or the United States. Departments are made up of a mayor and a departmental board, both of whom must defer to any national decision-making and abide by deconcentration. Departmental policies maintain the possibility of being invalidated by a higher authority and defer their jurisdiction to the federal level whenever the need arises. Some departmental responsibilities include but are not limited to building codes, emergency management, approving the municipal budget, authorizing the electrical system, and determining the nomenclature of streets, signs, parks, and other public commodities (Const. Uruguay Section XVI). Many of these powers do not escalate to anything more than what would be considered a local governmental authority in the United States with its powers restricted to the local administration.

The fiscal responsibilities granted to Uruguay reflect delegation on the part of the national government. The Uruguayan national government delegates its federal taxes to its departments; these federal taxes include income, capital, and consumption taxes. Departments are expected to delegate these taxes while also distributing their local taxes. These departmental taxes include taxes on real estate, vacant lots, advertisement, inappropriate construction, gambling, and more (Const. Uruguay Art. 275). These taxes reflect local and municipal-level

affairs not reaching the level of the federal government. These fiscal responsibilities show the top-down approach to the unitary state of Uruguay and its approach to delegation within the taxation system.

4.3 Argentinian federalism

Whereas the government of Uruguay went from decentralization to unitarianism, Argentina took the opposite route. The first president of the United Provinces, Bernardino Rivadavia, took charge of centralism by enacting sweeping welfare reforms with the intention of ‘modernizing’ the country (Shumway 1991). After years of infighting between federalists and unitarians, Rivadavia was able to take the helm with his liberal ideologies and more or less unite the country after 1811. Argentina experienced a federalist presidency with Juan Manuel de las Rosas and subsequently a unitarian president of Bartolome Mitre back to back. Afterward, Nicholas Avellaneda of Tucuman took charge of the country and established the federalist system of government that persists to this day (Lewis 2015). As a country that spans 2,780,400 sq km with a coastline of 4,989 km, Argentina maintains a large area that it delegates to local governmental bodies. With such a large and diverse swath of land under Argentina’s control, relegating some of its governmental authority to provinces is essential for the country’s functioning.

Within provinces, subnational actors such as governors maintain the most power. They have the authority to dictate their constitution, implement and interpret welfare policies, and claim all powers not explicitly given to the national government (Ardanaz and Tommasi 2014). Provincial actors maintain a great amount of autonomy when governing their individual provincial governments – with their own constitutions and ability to claim powers not claimed by the federal government, provinces essentially function on an independent basis. Extradition or

inter-provincial crime must follow the stated extradition agreements between provinces, which is up to the authority of each province (argentina constitution citation needed). By assigning a substantial amount of authority to provincial governments, devolution is shown to be a priority for the federal government.

The government consists of twenty-three provinces, each with its own methods of tax collection (Habibi, Miranda, et. al. 2003). Argentina diffuses the power of tax collection to individual provincial governments, giving them a significant amount of autonomy in taxation. Alongside taxation, about half of all public spending happens within the sub-national level of government, which the Inter-American Development Banks deems as the most decentralized country in public spending (Inter-American Development Bank 1996). In terms of fiscal responsibility, Argentinian provinces play a significant role in both taxation and public spending. Tax collection, discretion on tax rates, and decision-making in public spending are delegated to the provincial level. All of these characteristics highlight Argentina's high level of devolution and commitment to a federalist system.

Additionally, many of Argentina's provincial governments wield significant political power that challenges the essence of democracy. With such a high level of devolution, provincial political figures maintain significant control over the political arena. Carlos Gervasoni in his article "A Rentier Theory of Subnational Regimes: Fiscal Federalism, Democracy, and Authoritarianism in the Argentine Provinces" outlines various characteristics that operationalize the idea of democratic government within the sub-national level: incumbency control of the legislature and executive power, level of party contestation within the legislature and executive leadership, and term limits of provincial authorities (Gervasoni 2010). In addition to this numeric democracy calculation, the author also found an independent variable to explain this variation.

Carlos Gervasoni ran data analysis to determine that amount of fiscal transfers to provincial governments was related to their level of democracy – the more money provinces received from the federal government, the lower level of democracy they had. Sub-national governments prove to be affected by this aspect of fiscal decentralization and independence from the federal government and not all provinces are equal. With the level of fiscal transfers that come with sustainable investments to abide by the Kyoto protocol, acknowledging this effect on provincial governments is essential for determining the effect of a federalist government on Argentina's compliance with the protocol.

3. Commitments to the Kyoto Protocol

4.1 Argentinian commitments

Argentina signed the Kyoto Protocol in 1998 and its national legislature ratified it in 2001 (UNTC n.d.). Additionally, Argentina hosted the Buenos Aires Climate Change Conference for the Fourth Session of the Conference of the Parties, or COP-4, in 1998 which created specifications and added details to the Kyoto Protocol's implementation. In this follow-up to the original conference, participating countries agreed to comply with a two-year plan for the implementation of the agenda. Argentina surprised all involved by being the first developing country to commit to a binding emissions reduction target, something which was only reserved for developed countries in the original agreement (Bureau of Oceans and International Environmental and Scientific Affairs 1998).

Although this was an ambitious and unprecedented declaration, binding commitments for developing countries were not originally accounted for in the protocol. This left the conference

of parties with a challenging scenario of incorporating this objective into the content of the Kyoto Protocol. In the end, this proposal was eventually rejected by the parties as being inadmissible under the already complex agreement. The Argentinian delegation claimed that they never expected to have this proposal integrated in any official capacity, just that it would provide a commitment in the public record (Bouille and Girardin, n.d.).

This supplemental commitment came at a time when Argentina was attempting to strengthen its alliance with the United States. Under the Menem administration between the years 1989-1999, Argentina was taking steps to ensure a stronger bilateral relationship with the United States (Bouille and Girardin, n.d.). Argentina's voluntary emissions reduction decision was part of its diplomatic efforts, as the United States at the time had passed the Byrd-Hagel Resolution that required the Kyoto Protocol to maintain similar binding reduction commitments to developing nations (S.Res.98). Given this international context and the fact that the Menem presidency was explicitly seeking out relations with the United States, it can be inferred that this move was planned to gain their regard.

Argentina's emissions targets created during the protocol's ratification were dependent on its GDP growth. The country did not want to be handicapped by a phenomenon inevitable with economic growth and instead committed to a reduction in emissions proportional to its GDP. In their report to the United Nations Framework Convention on Climate Change in 1992, Argentina set their target as a reduction in emissions equal to an index of 151.5 "multiplied by the square root of the five-year average Gross Domestic Product" within the five years of 2008-2012 (Secretariat for Natural Resources and Sustainable Development 1999).

4.2 Uruguayan commitments

Uruguay followed a different path to emission reduction commitments than Argentina. As another Non-Annex I country, Uruguay was not bound to any commitments stemming from the Kyoto Protocol. Unlike Argentina, Uruguay did not make additional commitments and was not bound to a specific limit on emissions. Uruguay signed the Kyoto Protocol in 1998 and ratified it in 2001. The Kyoto Protocol's implementation in Uruguay is overseen by the Ministry of Housing, Land Planning and Environment (MVOTMA). Additionally, Uruguay has prioritized climate change mitigation by assigning its policy matters to a department assembled in 2009 named the National Climate Change Response System and the Variability (Ministerio de Vivienda Ordenamiento Territorio y Medio Ambiente 2016).

Uruguay outlined other non-specific goals in their first national communication, such as mitigation within the agricultural sector, reforestation projects, implementation of a training program for all governmental departments on climate change, incorporation of the private and NGO sector into projects, an inventory of greenhouse gas emissions, a reduction of GHG emissions proportional to GDP growth, and more. The Uruguayan government expressed its commitment to not only a focus on emission reductions but also to carbon sequestration and industry adaptation. Although not as specific as the Argentinian government in their emission reduction goals, Uruguay maintained its commitment to tackling emission producers and mitigation efforts country-wide. Most importantly, Uruguay detailed two plans with goals relating to bureaucratic implementation.

In their first national communication, Uruguay described two plans going forward. The first, Project URU/95/G31, describes goals that include:

- 1) Creating a climate change bureaucratic unit trained in compliance with UNFCCC climate measures
- 2) Creating a national greenhouse gas inventory updated at every Conference of the Parties
- 3) Training federal government employees in sustainable procedures within all areas of government
- 4) Identifying and preparing for possible mitigation measures/projects
- 5) Creating a public awareness campaign for climate change
- 6) Remaining in constant contact with the Conference of the Parties

The second plan named Project URU/94/008, described as the next phase of the Kyoto Protocol, elaborated on these objectives. This plan's targets included:

- 1) Identify and evaluate climate priorities and their possible implementation
- 2) Gather consensus over which climate measures should be the priority
- 3) Create plans to address identified priorities
- 4) Continue to work on the country's national communications for submission to the UNFCCC

While Argentina communicated a specific emission goal for themselves, Uruguay emphasized specific plans to guide the government. The majority of these goals centered around preparing their national government to respond to the overhaul needed for Kyoto implementation as well as the creation of mitigation projects.

4. Compliance with the Commitments

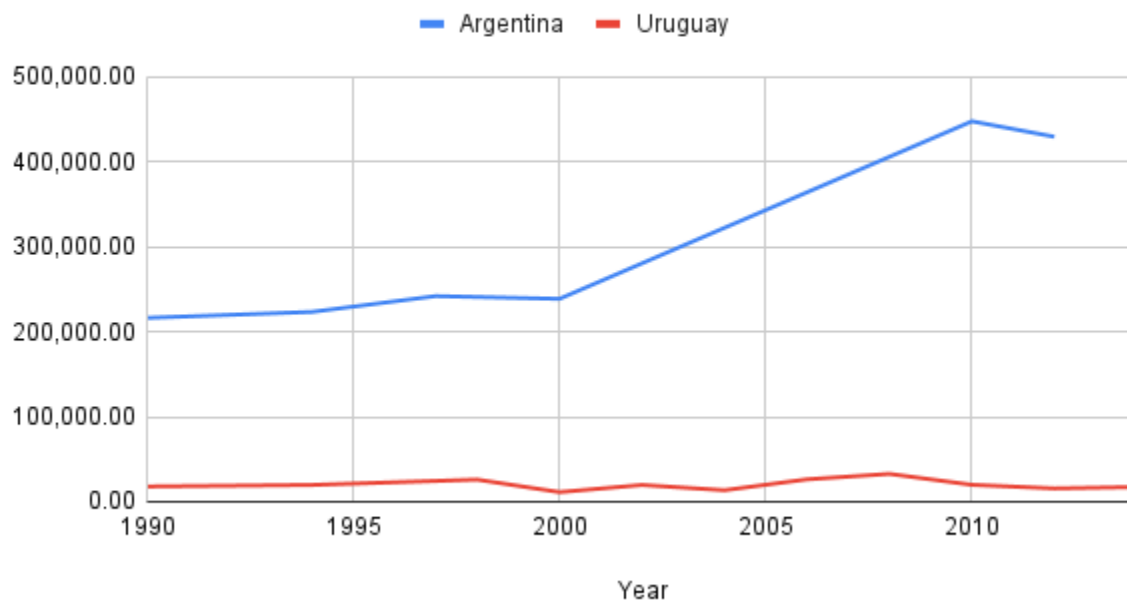
5.1 Quantification of compliance

As previously mentioned, compliance with the Kyoto Protocol for Non-Annex I countries is explicitly non-binding and left intentionally vague so that goals are attainable for all ratified Non-Annex I parties. In order to promote equity and encourage all countries to participate in conventions to the best of their ability, the UNFCCC proposed the concept of “common but differentiated responsibilities” that applies to all conventions relating to climate change (United Nations 1992). Requirements of participating parties are adapted to their respective capabilities, relieving some countries from unattainable expectations while increasing the expectations of more developed countries. This concept explicitly places more of the burden on more developed countries with more resources to adequately represent their abilities to combat climate change. Although common but differentiated responsibilities are intended to allow less developed countries with more flexibility in their obligations, it often manifests as undefined and indeterminate targets. When applied to wide-reaching conventions such as the Kyoto Protocol, parties with less responsibility also have less defined aims to provide indications of compliance.

These common but differentiated responsibilities within the protocol gave vague expectations to both Argentina and Uruguay. The most explicit goals set forth by the Conference of Parties were requirements of providing consistent data on greenhouse gas emissions and submitting updated reports to the Conference of Parties pertaining to their agreed-upon goals. The rest of the expectations involved directives to invest in sustainable projects and adapt current practices to combat climate change. The binding goals in the protocol are best found in the interpretation of these directives by individual countries within their original communications to the UNFCCC.

The figure below maps the self-reported data from Argentina and Uruguay's submissions to the UNFCCC. The data is measured in giga-grams and pulled from the countries' national communications. These numbers accounted for any carbon removals representing the net emissions from each country. It is important to note that greenhouse gas emissions data look different from different sources; some only measure the raw data of total emissions and do not account for carbon sequestration. Seeing as Uruguay has made a significant effort to offset its emissions with carbon removal projects, I have decided to include those removals in the data. While it is possible that the self-reported data could contain inconsistencies due to bias in the reporting, I felt that the best indicator of country-level emissions is from the countries themselves.

Total GHG emissions



By author, using data from Argentina and Uruguay National Communications

5.2 Argentinian compliance

Argentina's ambitious emission goals, although impressive on the world stage, were not executed or planned well enough to succeed. As previously mentioned, President Menem was committed to elevating Argentina's presence on the world stage during his administration from 1989-1999. Menem's posturing as a strong leader with the capability of leading his country through an aggressive greenhouse gas emission reduction may have garnered the attention he wanted, but ultimately added up to false promises of a strong central authority that could direct the country through his bold emission promises (Bouille and Girardin, n.d.).

The goal of reducing emissions attached to the index of 151.5 proportional to the change in GDP was ultimately a decision that was not based on any commissioned study or official reports and was considered arbitrary by many in Argentinian academic circles (Below, n.d.). Additionally, that specific metric was not mentioned in any national communications submitted to the Conference of the Parties after the Buenos Aires Conference in which it was originally proposed. Although the Menem administration undertook an extra effort to promote this ambitious and definite goal at the Buenos Aires Conference, it was never achieved and was only given a one-sentence acknowledgment in the second national communication. The fact that this goal was not required by the UNFCCC and was ultimately thought of as an arbitrary number does not exempt Argentina from this failure to reach what was a very public and 'binding' commitment in their proposed compliance with the protocol.

In their reports to the COP, Argentina outlined its greenhouse gas inventory as required by the Kyoto Protocol. The industries that contributed the most to emissions in 2010 were Energy at 42.7% and Agriculture and Livestock at 27.8%. The greatest source of carbon emissions comes from the Energy sector, while Agriculture and Livestock is responsible for the

most methane emissions. In total, Argentina saw a greenhouse gas emission increase of 47.3% from 1990-2010 (Argentina 2010).

In a report about environmental indicators in Latin America and the Caribbean, the World Justice Project and Banco Interamericano del Desarrollo gave Argentina a score of 0.39 for the capability of their environmental authority and a 0.43 concerning the collaboration between institutions on a scale of 0-1 with 1 being the best score (Pinheiro et al., 2020). Their regulatory compliance was rated 0.53 and absence of corruption was 0.53. The report also states that the government spends an average of 5.85 dollars per capita towards environmental costs which is much lower than the Latin American average of 22.95 dollars. While these statistics from 2020 surpass the Kyoto Protocol time span, they nonetheless present a valuable perspective of Argentina's institutional capabilities affecting its ability to comply with federal pledges of climate action.

In order to equip their government with Kyoto Protocol compliance, Argentina created the Unidad de Cambio Climático in 2003 as a subsidiary of their Secretariat of Sustainable Development (Argentina 2007). As dictated in their original goals, Argentina succeeded in designating a government agency to directly enforce the rules of the Secretariat intended to comply with the UNFCCC. Additionally, they created another arm concerned with both local and national governments named the National Advisory Commission on Climate Change which was stated to have included public and private partnerships, universities, and non-governmental organizations.

None of Argentina's reports to the UN included carbon sequestration through forestry or any reforestation efforts. This method posed the best opportunity to recapture the carbon emitted by Argentina to keep within their commitment to Kyoto, but as an agricultural-based economy,

they stated their inability to reforest potential cropland. Given Uruguay's similar climate and ecosystem, their successes with afforestation prove that it is entirely feasible for Argentina to follow the same path. Furthermore, Argentina had already proposed numerous afforestation methods that they deemed an attainable route to capturing more carbon. Uruguay and Argentina have both claimed in their reports that the greatest potential lies in sequestration through forestry methods, but Argentina has not demonstrated the initiative to act on this possibility. Argentina disclosed a problematic inability to accurately collaborate within its provinces to gauge the loss of forestland, saying that their projections were off by 20-30% as shown by satellite images (Argentina, 2007). Additionally, individual provinces were said to not have reported their forestry data and failed to provide any information to the federal government which handicapped their ability to keep track of the loss.

In their third national report to the UNFCCC in 2015, Argentina laid twelve aggressive plans to combat various sectors of climate change including energy, transportation, and agriculture. These plans included ambitious goals such as increasing energy use of renewable sources by 8%, investing in geothermal and biomass energy sources, improving railroads and public transportation, incorporating livestock areas into native forests, and providing tax credits for reforestation efforts. Even with these lofty goals to guide Argentina into a post-Kyoto age, Argentina still ranks as "Highly Insufficient" in their national emissions according to the Climate Action Tracker (*Argentina*, n.d.). When considering their expected contribution to global emissions based on the Paris Climate Accord notion of 'fair share', the country fails to reach its target by almost three degrees of warming. Although these goals were made after the Kyoto Protocol, the trend of average warming within Argentina reflects a decade's worth of non-compliance with emission commitments. Even with their aggressive Kyoto commitments,

Argentina fails to live up to their stated national targets and shows a nationwide difficulty in implementation and compliance with environmental goals.

5.2 Uruguayan compliance

Contrary to the specific numeric goal set by Argentina, Uruguay followed the trend of other Non-Annex I countries by simply committing to an effort to invest in initiatives that combat greenhouse gas emissions. Within the period 1990-2012, Uruguay saw an increase in greenhouse gas emissions by 22%. Their highest contributing industries are Agriculture at 73.8%, Energy at 21.8%, and Waste at 2.7%. Emissions from the Agriculture sector exclude their carbon dioxide emission capture programs, which implement carbon sequestration and methane reduction programs (UNTC 2012).

Although Uruguay showed an overall increase in emissions during the period before and after the Kyoto Protocol, Uruguay has been pursuing techniques to reduce emissions in the agriculture sector that has mitigated some of the effects of this overall increase. Given that Uruguay has stated that methane emissions contain the most warning potential within the country, mitigation was prioritized in the agricultural sector where the majority of methane occurs. This mitigation of greenhouse gas emissions was implemented through no-till agricultural practices, fertilizer efficiency, and reforestation.

To account for the GDP and industrial activity increase in Uruguay, their government prioritized project development of mitigation methods. The period of 1990-2002 demonstrated a concerted effort to reduce and mitigate emissions that resulted in a net decrease in emissions. These mitigation efforts resulted in Uruguay becoming a net carbon sink between the short period of 2000-2002. This was achieved by the increased use of hydroelectric power, the planting of forests that produced a 28% decrease in carbon emissions, and a 6% decrease in

nitrous oxide from the previous year through a decrease in use of ovine cattle and a decrease in use of nitrogen fertilizers (UNTC 2004). Uruguay committed to its original goal of prioritizing mitigation projects and adapting economic practices to decrease its impact on the environment. As stated in their goals of the first national communication, Uruguay focused on the agricultural sector that offered the most potential for mitigation methods. Although these projects within the period of 1990-2002 reflected the ambitious goals of their national communications, the trend did not last long.

The following period of 2002-2015 saw a decrease in mitigation methods and an increase in emissions. Among many factors, this trend came from a relative decline in energy produced by hydroelectric sources and an increase in the harvesting of forests. A drought decreased the efficiency of hydroelectric power while an increase in economic activity led to the need for increased forestation. The mitigation project efforts were deprioritized in favor of GDP growth, leading to their increase of GHG by 22% even considering the net negative emissions from 2000-2002.

In its fourth national communication to the UNFCCC, Uruguay acknowledged its decrease in mitigation measures. However, when taking into account the increase in GDP growth Uruguay stated that “although per capita GDP has almost doubled in the past ten years and food production increased threefold, GHG emissions remained almost constant, and even decreased significantly in some sectors” (Uruguay 2016). While they have gone off track of their original ambitious mitigation goals, the country claimed that they hope to become a carbon sink again by 2030. Under the new Paris Climate Accord, Uruguay will adopt new goals to comply with the replacement of the Kyoto Protocol.

Although Climate Action Tracker does not have a country profile for Uruguay, statistics of their environmental progress can still be found in the report of environmental indicators in Latin America by the World Justice Project and Banco Interamericano del Desarrollo. Similarly to Argentina, the report showed that Uruguay only spends an average of 5.85 dollars per capita on the environment while the average for Latin America is 22.95. Unlike Argentina, Uruguay was given a score of 0.76 for the capacity of governmental authority on the environment on a scale of 0-1. Regulatory compliance was 0.70 and the absence of corruption was 0.73.

After the ratification of the protocol, Uruguay soon established a program specifically intended to implement the requirements of the Kyoto Protocol. Named Programme of General Measures for Mitigation and Adaptation to Climate Change (PMEGEMA for short), this initiative entails working groups that address every sector of the economy including Agriculture and Cattle, Biodiversity, Wastes, Energy, Coastal, Water and Fisheries, and Human Health and Transport (Uruguay 2004). Following their original objectives, the first step of this working group was to establish an intersectional management system to coordinate the implementation of climate measures within all sectors of government.

Through this program, Uruguay implemented various regional projects to address environmental issues in different sectors, including academic studies of sea level rise in the Rio de la Plata coastal areas, developing adaptation strategies for livestock in mixed crop agriculture, and a study of methane emissions in bovine cattle. The most recent national communication in 2016 has also described projects of capturing biogas from urban waste, offering afforestation subsidies for the forestry sector, passing legislation to encourage biofuel production, and much more. These diverse initiatives covering every sector of the economy currently comply with Uruguay's original Kyoto commitments.

Other goals with which Uruguay has complied include remaining in contact with the Conference of the Parties by publishing regular national communications and updating national GHG inventories. While the country's emissions have greatly increased post-2002 and deforestation impacts carbon capture projects, the country has pledged to address this within the framework of the Paris Agreement. Overall, Uruguay has complied with almost all of its original commitments under the Kyoto Protocol. While their outcomes have not been perfect, Uruguay's track record is exemplary compared to other developing nations – in 2018, the environmental performance index ranked Uruguay's climate and energy score as the best performer in Latin America and sixth in the world (Herrera 2018). This score comes after a decade of dedication to the Kyoto Protocol spurred on by a dedication to sustainability. Their commitment to environmental bureaucratic engagement, consistency in regulatory compliance, mitigation initiatives in all economic sectors, and relatively low greenhouse gas emissions surpass the compliance of the Argentinian government.

5. Analysis of Similarities and Differences in Compliance

While a unitary state political system produces the best outcomes for compliance under the Kyoto Protocol, it is important to note that their respective processes towards developing a political system have been built on centuries' of state-building. The question of centralization created the foundation of the split of the two countries and almost all political infighting thereafter. Initiated by frustration with the centralization of Buenos Aires as the hub of economic and political activity, Uruguay split from the United Provinces but was plagued by factionalism concerning its unitary approach. Argentina experienced the same fight in the years after its independence but ultimately came to a different governmental operation. These political variations have adapted to each country's unique history and in no way is one political formation inherently superior to the other – This analysis is not a judgment on which state formation is better but rather what is best suited for the implementation of environmental conventions. Adhering and implementing environmental obligations pose a unique responsibility that the unitary state of Uruguay is better equipped to handle.

The implementation of environmental policy often entails unpopular practices. The foundation of economic growth relies on power to fuel production, which has historically been retrieved from burning fossil fuels. Lowering these emissions requires whole economies to restructure and invest in sustainable practices that often do not pay off until years later. To enforce these policies, states need to have strong institutions with regulatory abilities. Tasking lower entities, such as provinces or departments, with unpopular practices necessitates a regulatory oversight that ensures the follow-through of these lower authorities. The unitary structure has an innate advantage with this – the significant decision-making is delegated to

federal authorities and only the most mundane tasks are given to local authorities. Unitary structures have more oversight and participation in all aspects of environmental policy processes, discouraging any deviation from the original objective.

Argentina has no shortage of ambitious environmental objectives; its entry into the Kyoto Protocol itself came with a voluntary binding target of reducing greenhouse gas emissions following the equation of $E = I \cdot \sqrt{P}$ with a mathematically chosen index of 151.5 meant to follow the GDP trend. Whether this equation was arbitrarily chosen or not, it still represents an impressive commitment on the part of the Argentinian government. The government regularly posited comprehensive plans and proposals to decrease greenhouse gas emissions and encourage sustainable practices in all its communications to the UNFCCC, yet the follow-through was substandard. The most significant demonstration of this shortcoming is their greenhouse gas emissions; although Argentina put forth the most ambitious binding emission cap out of all other Non-Annex I countries, their execution was nowhere near their goal.

In Argentina, regulating emissions and enforcing federal-level environmental policies face immense bureaucratic complications that stem from provincial-level politics. While provinces maintain the authority to implement national policies, the authorities charged with this responsibility hold a level of discretion that can severely handicap its outcomes. Oftentimes, provincial political actors treat provincial politics as a springboard to their national political career and wield an inordinate amount of power over decision-making within the province. Democratic strength varies by province, with three of the lowest-scoring provinces producing three presidents within the past two decades (Ardenaz and Tommasi 2014). One of these provinces, Santa Cruz, contains the only coal mine in Argentina and is subject to more governmental regulation (Informe Nacional citation needed). Tasking provinces with the

management of federal funds and implementation of region-specific environmental programs becomes a more difficult task when sub-national politics are governed by varying strengths of democracy and influential political actors who leverage an improved public image.

In Argentina, controlling greenhouse gas emissions requires provincial-level regulation that targets specific industries within the region – a task left up to the provincial government controlled by governors who often have an inordinate amount of power over decision-making. While the national government aligns with aggressive emissions reduction goals, sub-national actors are not bound to cooperate in kind. With a GHG emission increase of 47.3% from 1990-2010 and a GDP growth of only 21%, Argentina's regulatory capabilities prove to be substandard. The country has no shortage of ambition as they consistently demonstrate aggressive environmental policy objectives on the international stage, but the power of the federal government is bound by state actors. With scores of 0.43 on a 0-1 scale for institutional collaboration and 0.39 for the capability of environmental authority, Argentina lacks the power to enforce the environmental goals advertised in international communication. Their lack of capability for collaboration and environmental authority damages their ability to exert influence over their 23 provinces. With diverse environmental needs and various emission sources all around the country, the weaknesses of this federalized state are fatal for sufficient environmental regulatory power.

The unitary state structure of Uruguay has shown a better ability to enforce its environmental regulations. As a state with more centralized authority, their capacity to comply with even unpopular environmental regulations becomes an easier task when the federal government has the ultimate power over their implementation. The same governing body that wrote Uruguay's Kyoto commitments maintains the power to control the manifestation and

enforcement of its resulting directives – making the chain of command smaller and more capable. Regulations such as emission caps or taxes on unsustainable products may be unpopular, but with a direct authority overseeing and enforcing them, regulations' rollouts the process is more streamlined.

Uruguay's ability for regulatory authority is best demonstrated through its greenhouse gas emission reductions that well surpass those of Argentina. Even though Uruguay did not lay out a specific goal it wanted to achieve, the country followed other developing countries by simply committing to a concerted effort in emissions reduction. Sustained efforts in carbon sequestration, renewable energy, and economic subsidies for sustainable practices, allowed Uruguay to slow down its emissions rates. Compared to Argentina's 47.3%, Uruguay displayed a staggering 22% increase from 1990-2010. Through prioritization of the methane emissions in the Agricultural sector, Uruguay was able to adhere to its commitments by putting forth an effort to regulate emissions. The country stated this same prioritization in its first national communication to the UNFCCC and was able to follow through with an attempt to decrease methane emissions.

Just like Argentina, Uruguay proposed lofty goals in its first commitment to the Kyoto Protocol. There is no shortage in either country of leaders determined to adhere to the aims of the treaty and place themselves on the world stage – the national communications prove that. But Uruguay has the regulatory advantage of a seat of power with closer proximity to the sectors in which it intends to regulate. As a state with strong centralized authority, control over environmental outcomes and energy emissions is more accessible and painless. As seen in the statistics that give Uruguay a 0.76 for capacity of environmental authority and a 0.70 for regulatory compliance, the state maintains more control over the regulations which it intends to implement. The federal government is in charge of crafting policies and determining the best

solution, while the departments only oversee their implementations and report back to the federal government. This ensures that even the most unpopular rules that come with environmental regulation are adhered to throughout the country.

Another element of the compliance process best suited for Uruguay's unitary structure lies in the project implementation promised in each country's commitment to the protocol. These projects, often entailing processes never before attempted, require specialized research and labor-intensive development. An interconnected web of economics, technology, and politics, the projects detailed within Kyoto need a well-supported team to develop the plans. This logistical analysis is oftentimes best suited for the political node of a country where the commitments originated; proximity to the most influential leaders, policymakers, and scientists occurs best in a capital or influential city. Within a unitary state, all the decision-making, planning, and implementation processes happen within the same capital, facilitating the process and ensuring follow-through from start to finish. In doing this, the Uruguayan unitary state can carry out its environmental regulation pertaining to commitments derived from the Kyoto Protocol.

While Argentina proposed a commitment to a specific cap on emissions, they never specified any goals for project implementation. Without explicit goals, it is hard to say whether they truly reached any targets under Kyoto in terms of successful policies. This failure of specification allowed Argentina ambiguous compliance with the protocol but indicates a lack of agreement and ambition to commit to identifying sectors that need improvement. Compared to Uruguay's extensive list of goals reaching across all areas of sustainability, Argentina shows a deficiency in project management. Given their failure to maintain even sufficient emission rates, it is safe to say that whatever successes they had with their policies were not adequate to deter the rate of emissions.

This is not to say that Argentina did not attempt environmental policies to adhere to the protocol. In their last report to the UNFCCC published in 2012, Argentina provided twelve plans dealing with sustainability in the sectors of afforestation, transportation, and energy usage. Later in the report, Argentina detailed thirty more project plans ranging from energy, social, agricultural, waste, industry, cattle breeding, and carbon sequestration. There is clearly no lack of aspiration, but rather the ability to make it happen. With these plans coming from the centralized authority in Buenos Aires, diffusing the leadership to the lower authorities of provinces across the country persists in negatively impacting its implementation. Even though the central authority of Argentina presents a commitment to reducing their emissions following the Kyoto Protocol and international standards, committing to projects aligning with this goal proves difficult with a highly decentralized structure.

On the other hand, Uruguay presented comprehensive project goals it intended to achieve. While this did not necessarily signify that they maintained the institutional strength to complete said projects, it does show the commitment to following through with a reduction in emissions. By laying out the specifics of the plans required for the enormous task of tackling emissions while encouraging growth, Uruguay set itself up a self-regulated accountability tracker. Uruguay proved committed to these goals, as every national communication referenced completed projects that maintained their standards. Following updates to the UNFCCC demonstrate a heightened ability to implement the plans outlined in their commitments.

The most significant indicator of Uruguay's successes in project implementation lies in the emission rate of a 22% increase, achieved by a significant investment in renewable technology. Although this is still shy of their ambitions, in the context of global inadequacy, this rate is impressive. Most importantly, Uruguay's commitment to carbon sequestration proves the

capability of the government's institutions to follow through on their goals; the most significant of its successes are shown with its impressive ability to be a carbon sink for two years, absorbing more carbon than they emit. This achievement, while short-lived, creates a blueprint for both developing and developed countries to follow. Accomplishing this was supported by a massive afforestation and renewable energy push, originating from the goals of the federal government in the Kyoto Protocol. The period after this success was still impressive, as their increase in forestation and decrease in renewable energy was caused by a jump in GDP and a drought that impacted the capability of hydroelectric energy sources.

The Uruguayan government accomplished these feats through a focus on project management and carbon sequestration from the very beginning of their implementation of the Kyoto Protocol. Uruguay understood the need for carbon capture projects in a world of GDP growth fueled by dirty energy sources. Accomplishing these projects required a strong federal government to take the goals of the protocol, translate them into actionable plans, and diffuse the programs throughout the country. With a greater grasp on the activities of the country, the federal government utilized its unitary structure to directly convert its proposed projects into action items under the direct purview of the federal government that introduced them. In the case of project management, Uruguay's centralized authority proved to be more effective in directing the country into plans that would further the goals of the Kyoto Protocol.

Just as detailed in their original reports, Uruguay emphasized not just regulations to control the increase of GHG emissions but also their commitment to sustainable project management. By the final year of the Kyoto Protocol in 2015, Uruguay had invested 15% of its total GDP into renewable energy (Hall 2023). These successes were accomplished by the Uruguayan Ministry of Housing, Territorial Regulation, and Environment established in the

country's original ratification of the Kyoto Protocol. This bureaucratic unit, as promised in the original commitment, identified potential sources of mitigation and acted on their implementation. This highly capable unit is the reason that Uruguay now runs on 98% renewable energy (Hall 2023). Initial projects such as the Energy Efficiency Project that increased demand for energy-efficient products or a nationwide study for improvements in energy efficiency within the agricultural sector experienced a follow through led to Uruguay proving itself to be one of the most sustainably-oriented countries in Latin America and whiting developing countries worldwide.

6. Conclusion

Examining the question of discrepancies in compliance with the Kyoto Protocol within the context of just two countries offers a unique opportunity to identify crucial aspects that affect compliance with IEAs in less developed countries. Uruguay and Argentina share many similarities and demonstrate many differences, but I have determined that the most significant factor in compliance with the Kyoto Protocol between the two countries is their approach to the centrality of their political systems.

Considering the role that centrality played in their shared political history and the influence of this characteristic on both politics and economics, examining this relationship within the implementation of the Kyoto Protocol offers valuable insight. Both nations grappled with unitarianism versus federalism throughout their independence processes, both with vastly different outcomes. Uruguay's departments compared to Argentina's provinces demonstrate stronger authority in terms of both taxes, legislative power, and discretion in project management. When it comes to the implementation of Kyoto Protocol commitments, the Argentinian provinces are delegated more authority than the weaker departments of Uruguay. This discrepancy affects the performance of both countries' compliance with the Protocol.

Although Argentina presents aggressive proposals at the federal level, these projects have poor follow-through due to high levels of inconsistency at the provincial level. Both corruption and variation in local-level leadership led to subpar compliance. On the other hand, Uruguay's federal government has more influence over the entire process, both with fiscal and political decisions. Uruguay's unitary structure is set up so that the federal level inherently has more oversight over government processes. The same federal government that commits to environmental goals in international agreements holds greater control in the implementation,

improving the process and facilitating the operationalization of the Protocol within the country. These differences between the two countries suggest a structural benefit from a unitary state in terms of complying with the Kyoto Protocol.

Uruguay's ability to implement sustainable policies is strongly affected by its unitary structure and centralization of federal authority willing to follow aggressive climate initiatives. On the other hand, Argentina's federal government may have ambitious ideas for sustainable policies but less follow-through. Disparities in provincial willingness or capacity to implement the goals of the federal government have been shown to handicap Argentina's capacity to execute its goals of the Kyoto Protocol and sustainable development as a whole.

Research into the political foundations of developing countries within the purview of international environmental agreements, while an important topic, is lacking. Understanding worldwide trends that affect IEA implementation within less developed countries has the potential to improve global compliance with some of the most important international conventions. While this piece of research only presents one idea from a set of two specific countries, it may lend itself to providing a path into more significant research within this topic. Many governmental structures function in similar ways across borders, and their approach to the level of centralization might offer worthwhile ideas going forward.

Comparing the superiority of a specific state structure must take into account the characteristics of countries that lead to this formation in the first place. Stating that Uruguay can better comply with the Kyoto Protocol in its attempt at sustainable development just because of its unitary structure would be a gross misrepresentation of its political nuances. The size of the country and homogeneity in both climate and sub-national administrations contribute to the success of unitarianism. In comparison, the sheer size of Argentina and differences in climate

and industry across provincial governments have contributed to its approach to decentralization. Comparisons of state structures must allow for a nuanced discussion of the factors that lead to these structures in the first place.

With this in mind, examining the advantages of a centralized power within environmental compliance can carefully be extrapolated into other situations. Climate policies require immense investment in both fiscal and political aspects, bringing a divestment from fossil fuel dependence that incurs economic complications, social pushback, and political disputes. Navigating these challenges appears to be an easier task for a centralized authority that oversees the national administration of sustainable initiatives. But even with these presumed upsides, it should be acknowledged that placing the majority of power into the hands of the centralized authority can still lead to unfavorable outcomes when the regime in power does not adhere to pro-environmental policy.

Although region-specific climate protections might be better suited for sub-national administrations, there are many other endeavors relevant to climate policy that can be highly effective when administered on a federal level. Industry emission regulations, national funding for renewable energy, collaboration with international bodies, conservation projects, and more are better suited for federal authorities. Of course, this assessment only works with environmentally-oriented federal administrations. Delegating the majority of the authority to the party in power can lead to disastrous results when said party is not amenable to sustainability-focused national policies, as seen in previous American administrations. Navigating this phenomenon merits its own study outside of the scope of this paper.

Going forward with this information, future scholarship on the successes and failures of international environmental collaboration or domestic climate policy should take into account the

effect of the level of centralization on the capabilities of governmental administration. When determining the best methods for implementing sustainable policies within all countries, but especially developing ones, adapting to the influence of a centralized or decentralized governmental structure is key for successful implementation. Whereas it is implausible that countries would completely restructure their state formation just for the enhanced ability to comply with international sustainable obligations, the international organizations that administer these obligations could consider restructuring their own agreements to adapt to diversity in state formation.

UNFCCC Reports Consulted

[Argentina First National Communication](#) – 1999

[Argentina Second National Communication](#) – 2007

[Argentina Third National Communication](#) – 2015

[Uruguay First National Communication](#) – n.d.

[Uruguay Second National Communication](#) – 2004

[Uruguay Third National Communication](#) – 2010

[Uruguay Fourth National Communication](#) – 2016

References

- Adewale. (2017). Import substitution industrialisation and economic growth – Evidence from the group of BRICS countries. *Future Business Journal*, 3(2), 138–158.
<https://doi.org/10.1016/j.fbj.2017.06.001>
- Álvarez, Bilancini, E., D'Alessandro, S., & Porcile, G. (2011). Agricultural institutions, industrialization and growth: The case of New Zealand and Uruguay in 1870–1940. *Explorations in Economic History*, 48(2), 151–168.
<https://doi.org/10.1016/j.eeh.2010.05.004>
- Ardanaz, Leiras, M., & Tommasi, M. (2014). The Politics of Federalism in Argentina and its Implications for Governance and Accountability. *World Development*, 53, 26–45.
<https://doi.org/10.1016/j.worlddev.2013.01.004>
- Argentina. (2007, October). *Segunda Comunicación Nacional de la República Argentina a la Convención Marco de las Naciones Unidas sobre Cambio Climático*. United Nations Framework Convention on Climate Change.
- Argentina. (2015, December 20). *Argentina Third National Communication*. United Nations Framework Convention on Climate Change.
- Argentina Climate Performance Ranking 2023*. (2022, November 14). Climate Change Performance Index; Germanwatch. <https://ccpi.org/country/arg/>
- Argentina*. (n.d.). Climateactiontracker.org.
- Below. (2015). *Environmental politics and foreign policy decision making in Latin America : ratifying the Kyoto protocol*. Routledge.
- Bergquist, Charles W. *Labor in Latin America: Comparative Essays on Chile, Argentina, Venezuela, and Columbia*. Stanford University Press, 2010.

- Bouille, D., & Girardin, O. (n.d.). Learning from the Argentine Voluntary Commitment.
Retrieved January 27, 2023, from http://pdf.wri.org/opc_chapter6.pdf
- Bureau of Oceans and International Environmental and Scientific Affairs. (1998, December).
The Buenos Aires Climate Change Conference. U.S. Department of State Archive.
https://1997-2001.state.gov/global/global_issues/climate/fs-cop4_final_981200.html
- Carolina Román & Henry Willebald (2021) Structural change in a small natural resource
intensive economy: Switching between diversification and re-primarization,
Uruguay, 1870–2017, *Economic History of Developing Regions*, 36:1, 57-81,
DOI: 10.1080/20780389.2021.1878457
- Constitution of the Oriental Republic of Uruguay*, 27 November 1966, available at:
<https://www.refworld.org/docid/3ae6b5600.html>
- Debowicz, & Segal, P. (2014). Structural Change in Argentina, 1935–1960: The Role of Import
Substitution and Factor Endowments. *The Journal of Economic History*, 74(1), 230–258.
<https://doi.org/10.1017/S0022050714000084>
- Della Paolera, & Taylor, A. M. (2003). *A new economic history of Argentina*. Cambridge
University Press.
- Droller, F., & Fiszbein, M. (2021). Staple Products, Linkages, and Development: Evidence from
Argentina. *The Journal of Economic History*, 81(3), 723-762.
doi:10.1017/S0022050721000383
- Féliz, M. (2019). Neodevelopmentalism and Dependency in Twenty-first-Century Argentina:
Insights from the Work of Ruy Mauro Marini. *Latin American Perspectives*, 46(1),
105–121. <https://doi-org.utk.idm.oclc.org/10.1177/0094582X18806588>
- Galiani, S., Somaini, P. Path-dependent import-substitution policies: the case of Argentina in the

- twentieth century. *Lat Am Econ Rev* 27, 5 (2018).
<https://doi.org/10.1007/s40503-017-0047-4>
- Gervasoni, C. (2010). *A Rentier Theory of Subnational Regimes: Fiscal Federalism, Democracy, and Authoritarianism in the Argentine Provinces*. *World Politics*, 62(2), 302-340.
doi:10.1017/S0043887110000067
- Grubb, Vrolijk, C., & Brack, D. (2017). *Kyoto protocol : a guide and assessment*. Routledge.
- Glaeser, Di Tella, R., & Llach, L. (2018). Introduction to Argentine exceptionalism. *Latin American Economic Review*, 27(1), 1–22. <https://doi.org/10.1007/s40503-017-0055-4>
- Habibi, Huang, C., Miranda, D., Murillo, V., Ranis, G., Sarkar, M., & Stewart, F. (2003). Decentralization and Human Development in Argentina. *Journal of Human Development* (Basingstoke, England), 4(1), 73–101. <https://doi.org/10.1080/1464988032000051496>
- Hanf and Koonen, T. A. J. (1985). *Policy implementation in federal and unitary systems : questions of analysis and design*. M. Nijhoff.
- Hanson. (1976). *Utopia in Uruguay : chapters in the economic history of Uruguay*. Oxford
- Hudson, R. A., & Meditz, S. W. (Eds.). (1990). *Uruguay: a country study*. Federal Research Division. Retrieved from
http://memory.loc.gov/master/frd/frdcstdy/ur/uruguaycountryst00huds_0/uruguaycountryst00huds_0.pdf
- Hall, S. (2023, January 4). *Uruguay is a sustainability success story - here's why*. World Economic Forum. Retrieved April 4, 2023, from
<https://www.weforum.org/agenda/2023/01/uruguay-sustainable-energy-renewables/>
- Inter-American Development Bank (1996) *Economic and Social Progress in Latin America*. 1996 Report, Johns Hopkins University Press, Washington DC.

- Katra. (2017). *José Artigas and the Federal League in Uruguay's War of Independence* (1810-1820). Fairleigh Dickinson University Press. University Press.
- Lewis. (2015). *The History of Argentina* (Second edition.). Greenwood, an imprint of ABC-CLIO, LLC.
- Kellenberg, D., & Levinson, A. (2014). Waste of Effort? International Environmental Agreements. *Journal of the Association of Environmental and Resource Economists*.
[https://doi.org/2333-5955/2014/0101-0006\\$10.00](https://doi.org/2333-5955/2014/0101-0006$10.00)
- Manzetti, L. (1992). The Evolution of Agricultural Interest Groups in Argentina. *Journal of Latin American Studies*, 24(3), 585–616. <http://www.jstor.org/stable/156776>
- Ministerio de Vivienda Ordenamiento Territorio y Medio Ambiente. (2016). Uruguay's Fourth National Communication to the Conference of the Parties. United Nations Framework on Climate Change.
https://unfccc.int/sites/default/files/resource/updated%20Executive%20Summary%20Uruguay_0.pdf
- Mitchell, R. B. (2003). International Environmental Agreements: A Survey of Their Features, Formation, and Effects.
<https://doi.org/10.1146/annurev.energy.28.050302.105603>
- Pinheiro, M. V., Sanchez, L. R., Long, S. C.; Ponce, A. (2020). *Indicadores de Gobernanza Ambiental para América Latina y el Caribe*.
- Sawers. (1996). *The other Argentina : the interior and national development*. Westview Press.
- Secretariat for Natural Resources and Sustainable Development. (1999, October). Revision of the First National Communication. United Nations Framework Convention on Climate Change. <https://unfccc.int/resource/docs/natc/argnc1e.pdf>

Shumway, Nicolas. *The Invention of Argentina*. Berkeley: University of California Press, 1991. Print.

Spektorowski, A. (2000). Nationalism and Democratic Construction: The Origins of Argentina and Uruguay's Political Cultures in Comparative Perspective. *Bulletin of Latin American Research*, 19(1), 81–99. <http://www.jstor.org/stable/3339706>

Spruk, R. The rise and fall of Argentina. *Lat Am Econ Rev* 28, 16 (2019).
<https://doi.org/10.1186/s40503-019-0076-2>

S.Res.98 - 105th Congress (1997-1998): A resolution expressing the sense of the Senate regarding the conditions for the United States becoming a signatory to any international agreement on greenhouse gas emissions under the United Nations Framework Convention on Climate Change. (1997, July 25).
<https://www.congress.gov/bill/105th-congress/senate-resolution/98>

Vanger, & Vanger, M. I. (2010). *Uruguay's José Batlle y Ordoñez : the determined visionary, 1915-1917*. Lynne Rienner Publishers

United Nations. (1992). United Nations Framework Convention on Climate Change. UNFCCC. Retrieved April 5, 2023, from <https://unfccc.int/resource/docs/convkp/conveng.pdf>

United Nations Climate Change. (2019). *What is the Kyoto Protocol?* UNFCCC; UNFCCC.
https://unfccc.int/kyoto_protocol

United Nations Economic Commission for Latin America and the Caribbean. (n.d.). Uruguay - political and electoral system. Gender Equality Observatory for Latin America and the Caribbean

United Nations Framework Convention on Climate Change. (2008, December 10). Ideas and proposals on the elements contained in paragraph 1 of the Bali Action Plan. Ad Hoc

- Working Group on Long-Term Cooperative Action under the Convention.<https://unfccc.int/resource/docs/2008/awglca4/eng/misc05a02p01.pdf>
- UNTC. (n.d.). Kyoto Protocol to the United Nations Framework Convention on Climate Change. https://treaties.un.org/Pages/ViewDetails.aspx?src=IND&mtdsg_no=XXVII-7-a&chapter=27&clang=_en
- Uruguay. (2016). *Fourth National Communication to the Conference of the Parties in the United National Framework Conventions on Climate Change*. United Nations Framework Convention on Climate Change.
- Weinstein. (1988). *Uruguay, democracy at the crossroads*. Westview Press.
- Wingeyer AB, Amado TJC, Pérez-Bidegain M, Studdert GA, Varela CHP, Garcia FO, Karlen DL. Soil Quality Impacts of Current South American Agricultural Practices. *Sustainability*. 2015; 7(2):2213-2242. <https://doi.org/10.3390/su7022213>
- Yaffè, Jaime. *Ideas, programa y política económica del Batllismo*. Uruguay 1911-1930. Montevideo: Udelar. FCEA.Iecon, 2000. Serie Documentos de Trabajo;07/00.