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Water Accessibility: Tapping into the Governance of Water and Sanitation

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WATER ACCESSIBILITY:

TAPPING INTO THE GOVERNANCE OF WATER AND SANITATION

by

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Under the Direction of Charles Hankla, PhD

ABSTRACT

In this study I investigate sub-national governments to determine whether the accountability derived from local elections improves the delivery of a vital resource – potable water – to the population and, additionally, consider accessibility to improved sanitation. I utilize a cross-national differenced random effects model of 156 countries from 1990-2007 and examine the complex relationship between water, sanitation, and local government. This analysis finds that States with locally elected municipal government have a higher percentage of people with access to improved water and sanitation facilities as opposed to States without locally elected municipal government.

INDEX WORDS: Water accessibility, sanitation, local goods and service delivery.

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DEDICATION

This thesis is dedicated Bruce and Carol Boyer, my parents. While you are no longer here in this material world, you continue to live through my ambitions and inspire me daily to pursue higher education. Thank you for the gift of a wandering spirit and encouraging me to live life with passion in all my endeavors. Without your loving support and encouragement, I would not be the woman I am today.

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1 INTRODUCTION

Humanity's need for clean drinking water cannot be overstated. From Mesopotamia to London, great civilizations were built upon the banks of the Earth's waterways. Water, more than anything else, ensures humankind's survival and prosperity. In fact, the human body needs between 2-3 liters of water each day to survive (World Health Organization 2011). Yet, only three percent of the world's water supply is fresh, drinkable water (World Wildlife Fund 2016). Of that three percent, less than one percent is accessible for human consumption (World Wildlife Fund 2016).

As water plays the pivotal role in sustaining human life, the United Nation's Millennium Development Goals (MDGs) prioritize the value of water. Outlined by MDG seven, target C, the United Nations established the goal of halving the number of people without access to adequate water and sanitation by 2015 (United Nations Department of Public Information 2016). Despite the notable achievement of the water component of this goal, the sanitation aspect was not accomplished (United Nations Department of Public Information 2016). In fact, the United Nations approximates that 2.4 billion people remain without access to improved sanitation facilities such as toilets that flush to a piped sewer system or ventilated pit latrines (United Nations Department of Public Information 2016).

In 2016, the MDGs were succeeded by the Sustainable Development Goals (SDGs), which also prioritize the value of water and sanitation in Goal Six: globally ensuring availability and viable management of water and sanitation (United Nations Department of Public Information 2016). Moreover, targets one and two of SDG six go further than the MDGs by calling for universal and equitable accessibility to safe water and sanitation amenities for all by 2030 (United Nations Department of Public Information 2016).

This goal is especially important as some reports estimate that up to 80 percent of diarrheal diseases in developing countries stem from inadequate water and sanitation (United Nations Department of Public Information 2003). Diseases caused by inadequate water, sanitation, and hygiene are estimated to cost 443 million school days annually (United Nations Department of Public Information 2006). Likewise, women without access to adequate toilets or latrines often utilize open areas and are increasingly vulnerable to intimidation and abuse (United Nations Human Rights Office of the High Commissioner 2016).

With the exponential growth of global water use, coupled with chronic water shortages, the efficient management of water is more pressing than ever. It is estimated that, for every $1 invested in water and sanitation, there is a $5 return (World Health Organization 2004). This financial return is realized through increased levels of individual productivity, reduced health care costs, and the prevention of illness, disability, and death (World Health Organization 2004).

Water shortages and its consequences, however, do not impact developing countries alone. In 2014 in an effort to reduce expenditures, the City of Flint, Michigan began to transition their primary water source from Lake Huron to the Flint River (New York Times 2016). While in theory this transition was initiated as a cost cutting measure for the city, the transition led to widespread lead contamination of the local water source (New York Times 2016). Additionally, in April 2015, the state of California initiated mandatory water use restrictions to combat shrinking water supplies and ensure an adequate supply of drinking water for the summer drought (O'Connor 2015).

In principle, democracies respond to the needs of the many, yet, often in developing democracies, it is not clear that elected governments do a better job than non-elected governments on this issue. In this study I investigate sub-national governments to determine

whether the accountability derived from local elections improves the delivery of a vital resource – potable water – to the population and will, additionally, consider accessibility to improved sanitation. I utilize a cross-national differenced random effects model of 156 countries from 1990-2007 and examine the complex relationship between water, sanitation and local government.

2 LITERATURE REVIEW

The broader question of who or what governs water and sanitation and therefore, universal accessibility to adequate water and sanitation supply is highly important. The implications of water insecurity and lack of sanitation are immense and impact not only an individual's livelihood but also the overall ability of society to operate. As such, accessibility to water and sanitation spans multiple disciplines, including, economics, public administration, and public health. The main discussion regarding the distribution of this scarce resource draws from the following literature: redistributive politics, institutions, political competition, decentralization and governance. Below is not an exhaustive literature review, but rather, an introduction to the primary approaches utilized by scholars investigating factors that impact water and sanitation accessibility and more generally, the delivery of public goods and services.

2.1 Redistributive Politics

Literature concerning redistributive politics contributes to answering questions regarding the relationship between local government and the accessibility of water and sanitation. While there is not a unanimously accepted definition of redistributive politics, Dixit and Londregan (1996) identify two distinct types of redistribution, grand and economic. Grand redistributive politics is defined as the allocation of public goods and services to promote an egalitarian society by allotting benefits to the public through social welfare programs or progressive taxation (Dixit

and Londregan 1996). Essentially, the grand redistributive programs are established for substantial periods of time and modified only when there is a significant ideological shift in the populations' beliefs (Dixit and Londregan 1996). Alternatively, economic redistribution manifests itself in the forms of grants, targeted tariff protection, construction projects, and "pork barrel" spending (Dixit and Londregan 1996: 1133). Dixit and Londregan (1996) state that in the United States and elsewhere, economic redistribution is much more the reality of everyday policymaking, compared to the grand redistribution, which happens less frequently.

Within the redistributive literature, the elected officials relationship with the population is vital. Particularly, discussions over whether political parties focus on core voters or swing voters for the delivery of public goods and services prove to be a point of contention amongst scholars (Dixit and Londregan 1996; Rosenzweig 2015). The core voter theory asserts that ideological commonalities incentivize incumbent governments to provide increased levels of public goods and services to areas where they have increased levels of electoral support (Cox and McCubbins 1986).

There are two primary focuses of the argument for a core voter strategy (Rosenzweig 2015). The first focus asserts that the ruling party will target efforts to benefit their most loyal voters (Hiskey 1999). Essentially, the targeted support provided by the ruling party to their core support is a way to penalize those supporting the opposition parties and deter future voter defections by rewarding supporters for party loyalty (Hiskey 1999). The second focus asserts that if a political party has clear ideas regarding how core voters will react as a result of their continued communication with the party, then during competitive elections, risk averse parties will align their pork with base voters as they believe that they are a worthy electoral investment (Cox and McCubbins 1986).

In contrast to the core voter theory is the swing voter theory. Essentially, the swing voter theory, forecasts that public goods and services are overwhelmingly allocated to centrist voters as political parties attempt to garner the support of the center of the political spectrum (Kroth et al. 2016). Dixit and Londregan (1996) create a model of political competition in which two parties contend for voters' electoral support. The central idea is that voters have diverse preferences, and targeted benefits can influence voters' party loyalties (Dixit and Londregan 1996). Dixit and Londregan (1996) assert that political parties are partial to moderate voters who can be influenced by redistributive benefits. Accordingly, voters are interested in the redistribution of benefits to themselves (Dixit and Londregan 1996).

Various models of political competition emphasize the redistributive politics question in isolation, considering how resources will be distributed under majority rule (Shepsle and Weingast 1981). Other models emphasize primarily the position-issues aspect of political competition claiming that, "…apathy among citizens toward elections, ignorance of the issues, the tendency of parties in a two-party system to resemble each other, and the anti-consumer bias of government action can all be explained logically as efficient reactions to imperfect information in a large democracy" (Downs 1957: 149).

Scholars such as Lindbeck and Weibull (1987) investigate the balanced-budget redistribution between socio-economic groups as the outcome of electoral competition between two political parties (Lindbeck and Weibull 1987). Essentially, Lindbeck and Weibull (1987) assert that the driving forces behind government-driven redistributions of income and wealth are not well understood. Lindbeck and Weibull (1987) find that under the assumption that two competing political parties will try to maximize their number of votes from self-interested voters, an equilibrium solution for redistributive policy will exist as long as a sufficient degree of

preferential uncertainty is present in the electorate. In instances when no variations in party preferences are present, and consumption preferences are varied, redistributions will be furthered until the average marginal utility of consumption is equal across socioeconomic groups (Lindbeck and Weibull 1987).

While the redistributive politics literature makes unique contributions to the field, these theories are seldom applied to global sanitation and water accessibility. Thus, in this analysis I will further this literature by looking specifically at the water and sanitation component of redistributive politics.

2.2 Institutions

The second major approach utilized to investigate water accessibility and sanitation is analyzing the efficiency of institutions in society. The principle idea is that strengthening institutional capacity and organizational efficiency indirectly leads to a higher level of water accessibility. Essentially, if the institutions function effectively, then the distribution of public goods and services, including water, will also be efficient.

Another component within the institutions literature is the importance of public infrastructure as an impetus to economic development (Duffy-Deno and Eberts 1991; Mera 1973; Snickars1989; Cutanda and Paricio1994). Various reasons are offered for this importance. Perhaps, the most compelling reason emphasizes the role of "public capital as: an ‘unpaid factor of production' which directly leads to increased output"(Lewis 1998, p.42). Essentially, economic growth leads to higher municipal incomes and ultimately translates to improved water within a society (Lewis 1998). In this perspective, many scholars investigate the institution of the party system in influencing policy-making and governance (Banerjee and Hankla 2014).

Over the years, scholars have taken a vested interest in the relationship between party systems and the delivery of public goods and services. Party systems are analyzed in various capacities including, the number of effective parties and their respective stability over time (Banerjee and Hankla 2014). Alternatively, another area of research includes understanding why party systems vary drastically cross-nationally and utilizing the different parties as independent variables to explain policy outcomes (Banerjee and Hankla 2014). Particularly of interest, is the number of parties present within in society that will lead to the optimum level of political competition facilitating the delivery of public goods and services. In fact, literature on electoral competition demonstrates that reduced numbers of effective parties may inhibit the delivery of public goods and services by reducing the chance of losing seats during elections (Banerjee and Hankla 2014).

Moreover, many scholars analyze party stability as an indicator of public goods provision (Banerjee and Hankla 2014). Predominantly, this area of research focuses on party stability, which is asserted to lead to improved state governance. Essentially, stable party systems enable politicians to "think beyond transfers to their constituents" (Banerjee and Hankla 2014: 5). Alternatively, scholars claim that increased party fragmentation reduces the motivation of elected officials to provide public goods and services (Banerjee and Hankla 2014). In fact, scholars have linked higher levels of party fragmentation with unfavorable policy outcomes (Banerjee and Hankla 2014).

The advancement of electoral institutions has been an integral component of good governance programs in international development agencies since the 1990s (Carothers 1995). However, Cleary (2007) asserts that this confidence in electoral institutions is not justified, as there are many limitations of elections as tools of democracy. For instance, "biased electoral

rules, principal-agent problems, clientelism, and authoritarian political cultures" are all potential inhibitors of an elections ability to create attentive, responsible, or participatory governments" (Cleary 2007: 283). While there is no question that elections have the capacity to generate a level of responsiveness and accountability, the usefulness differs across "institutional and political settings" (Cleary 2007: 283).

While the institutional literature makes interesting contributions to the field, these theories are not analyzed in tandem with global sanitation and water accessibility. Thus, in this analysis, I look at the aforementioned variables in tandem with their relationship between water and sanitation accessibility and redistributive politics and institutions.

2.3 Political Competition

Insight into what makes a government receptive to their people's needs is an integral issue in the discussion of the delivery of public goods and services. Scholars often refer to political competition as a significant instigator of beneficial political and social outcomes. Outcomes, which include improved representation from elected officials (Powell 2000), enhanced economic performance (Przeworksi and Limongi 1993), the protection of human rights (Beer and Mitchell 2004), and decreased global conflict (Bueno de Mesquita et al. 1999; Diamond 1999). Likewise, in many instances scholars argue that higher levels of political competition lead to improved delivery of public goods and services as it encourages elected officials to respond to the demands of citizens (Barro 1973; Besley and Burgess 2002; Ferejohn 1986; Hiskey 1999; and Wittman 1989, 1995).

Other scholars such as, Cleary (2007) assert that there are two competing theories regarding how democracy produces responsive government. First, electoral theories of democracy postulate that elected officials are responsive to public demands because citizens can

remove unfavorable politicians and select another candidate (Cleary 2007). For instance, elected officials frequently desire to remain in office or seek higher-level political positions in the future (Taylor 1992). If there is no immediate reelection threat, elected officials may still be responsive to their constituents needs so as to establish good rapport for their future political ambitions (Taylor 1992). Likewise, the elected official's desire to protect or enhance their political party may ensure that elected representatives are responsive to their citizenry (Taylor 1992). Political parties are capable of incentivizing responsiveness in elected officials via managing political appointments, electoral nominations and government largesse (Carey 1996; Taylor 1992).

Second, there is the participatory theory, which links responsiveness to a population's ability to outline their needs and influence government through other political action (Cleary 2007). Hirschman (1970) asserts that the elected officials will be responsive to constituent activism that poses an electoral threat. Essentially, citizen participation informs elected officials about their population's concerns, however, the government is attentive to these demands when the afflicted population poses a credible threat to vote the elected official out of office (Hirschman 1970).

Participatory theory further argues that a relationship exists between government performance and involvement when there are competitive elections (Hirschman 1970). However, in addition to a credible threat to elected office, alternative mechanisms are asserted to explain government responsiveness. For instance, participation can lead to increased responsiveness from elected officials if there are connections between the elected officials and their constituency through social networks (Putnam 1993). The idea is that social networks can reinforce social norms leading to improved government performance and attentiveness (Putnam 1993).

Cleary (2007) tests both electoral theories of democracy and participatory theory using his original dataset that combines "electoral, socioeconomic, and public-financial indicators" for all the municipalities in Mexico between the years 1989 to 2000 (Cleary 2007, p. 283). Cleary's analysis, however, finds that electoral competition has no effect on municipal government performance (Cleary 2007). Rather than the threat of electoral punishment facilitating political responsiveness, the caliber of local authorities in Mexico is contingent on an active citizenry and collaboration between elected officials and their constituents (Cleary 2007). As such, responsiveness may rely on a population's ability to outline their needs and pressure officials through "protest, public speech, lobbying, collective action, or direct contact with government officials" (Cleary 2007, p. 284).

Furthermore, Besley and Burgess (2002) conduct a unique analysis investigating the importance of the flow of information regarding policy actions and political responsiveness within a society. An important question Besley and Burgess (2002) pose includes, what institutions and mechanisms enable vulnerable citizens to have their preferences represented in policy. Besley and Burgess (2002) assert that it is vital that vulnerable populations have enough electoral power to swing outcomes if politicians are to be responsive to their demands which is more likely to be true when electoral turnout is high and political competition is intense (Besley and Burgess 2002). Using India as a case study, Besley and Burgess (2002) find that state governments are increasingly attentive to the needs of their local population when there are higher levels of media circulation and electoral accountability. This relationship indicates that there are distinct roles for both the media and democratic institutions in furthering the preferences of citizens in the policy agenda (Besley and Burgess 2002).

Finally, Rosenzweig (2015) poses the question of whether, "electoral competition [improves the provision of public goods] in dominant-party regimes"(Rosenzweig 2015: 72). Rosenzweig's (2015) analysis asserts that local electoral competition does not impact dominant-party systems significantly to upset their hold on office. However, political competition does advance the delivery of public goods and services (Rosenzweig 2015). This improved delivery of public goods is a result of the dominant party's ambition to increase their governing majority (Rosenzweig 2015). In the case study of Tanzania, Rosenzweig (2015) shows that increased levels of political competition lead to greater accessibility to public goods and services. The central idea is that political competition is linked to improved public goods delivery as the dominant party focuses their resources on the districts with higher levels of competition in an effort to increase their domination (Rosenzweig 2015).

2.4 Decentralization and Governance

The final of the major approaches utilized when analyzing the accessibility to improved water and sanitation is the relationship between the type of government within a country and its capacity to distribute resources and the decentralization of power to subnational authorities. Various studies suggest that democracies deliver public goods and services more efficiently than autocratic regimes (Lake and Baum 2001, Buena de Mesquita et al. 2003, Min 2015). Whether it's the state level government or the local-level government, scholars overwhelmingly consider the typed of government to be of the utmost importance when analyzing resource distribution (Lucia De Stefano et al. 2014; Eduardi Araral and Yahua Wang 2015).

Martinez-Bravo et al. (2012) and Zhang et al. (2004) assert that local elections in Chinese municipalities improved the distribution of public goods and services. Other scholars such as Skoufias et al. (2014) investigated the impact of direct elections in Indonesian municipalities and

Olken (2010) provides the theoretical backing that "participatory, rather than representative, democracy in Indonesian villages led to higher voter satisfaction with development projects" (Kroth et al. 2016, p.22). Various scholars suggest that media access leads democracies to better serve their local populations by providing local goods and services as a result of showcasing political competition between elected officials (Sen 1999).

Elections are tools utilized to establish political accountability (Bardhan 2002). Often, nongovernmental organizations and alternative institutional devices are used to bolster local accountability (Bardhan 2002). Likewise, "yardstick competition," when districts are compared with each other, is another way to increase accountability (Besley and Case 1995). Essentially, the effort of elected officials is not directly visible to the population, as such, when unfavorable outcomes occur, these officials can convey that they put their best efforts forth under the circumstances (Besley and Case 1995). However, if the adverse results that divide effort and outcomes correlate across districts, then yardstick competition can serve as a performance indicator of the particular elected official (Besley and Case 1995).

Likewise, decentralization, defined as the central government devolving power to sub-national authorities, is widely accepted as a way to improve the delivery of public goods and services to the population (Mawhood 1983). Essentially, this devolution of authority to lower levels enables more autonomy in local decision-making processes leading to the improved delivery of public goods and services. Tiebout (1956) initiated the theory that decentralization can lead to increased efficiency of the delivery of public goods. Asserting that citizens have the ability to relocate geographically based on a preference of government services in countries where state power is decentralized (Tiebout 1956). Furthering this idea, Oates (1972) fleshed out a more inclusive theory about the ideal level of decentralization. Notably, scholars do not have

consensus on whether decentralization is necessary for the improved delivery of public goods. In fact, critics highlight that relocating geographically is expensive, and that it is unrealistic that citizens would move based on tax and spending desires (Manor 1999; Bardhand 2002).

Central governments are increasingly transferring power to elected local government, hoping to improve the distribution of goods and services by bringing officials closer to the people (Hankla and Downs 2010). The accountability created between elected local councils and the people through the process of decentralization is critical. However, the processes mentioned earlier, on their own, are not sufficient to improve the provision of public goods and services, but rather, collectively these approaches play a major role in the process. Accordingly, when local governments are responsible for water services, water accessibility and the reliability of service provision is greater than when provided by central governments.

Scholars frequently assert that decentralization leads to increased accountability because the people are closer to the government. Essentially, the local population is better able to monitor the actions of elected officials when they are local opposed to when they are in the national capital (Von Braun and Grote 2002). This improved relationship between the local government and the people leads to more efficient delivery of public goods. Alternatively, other studies indicate that decentralization leads to increased political participation (Manor 1999; Crook 2003). Moreover, local elected officials are better equipped to determine what the population needs.

Often decentralization is viewed as way increase public participation, efficiency, equality, economic development and a way to monitor government resource allocations (Bardhan 2002). When government decision-making is closer to the people, decentralization is asserted to improve accountability resulting in a more efficient government (Bardhan 2002). In cases where

power is decentralized to actors not accountable to their people, then it is unlikely that decentralization will achieve improved delivery of public goods and services (Bardhan 2002).

Moreover, franchise extension has the ability to shift the median voter in a manner that impacts the size of the government, the redistribution towards the poor, and the delivery of services, benefiting the newly enfranchised (Meltzer and Richard 1981, Husted and Kenny 1997, Boix 2003, Aidt and Dallal 2007, Miller 2008, Aidt and Eterovic 2011, Aidt and Jensen 2013, Fujiwara 2015, Vernby 2012). This reasoning is especially relevant in South Africa as following the apartheid era, the formally disenfranchised were extended the right to vote shifting the median voter drastically.

Scholars assert that, municipalities with high numbers of recently enfranchised voters, and an obvious shift in the median voter, experience higher levels of household electrification in South Africa between 1996-2001 (Kroth et al. 2016). However, why would this logic and reasoning only apply to electrification and not the water and sanitation sector? This theory stipulates that African National Congress (ANC) core constituencies were prioritized leading to improved service delivery overall (Kroth et al. 2016). However, this theory does not seem to be applicable to the water and sanitation sector in South Africa despite a highly similar development process to electrification. While this analysis advances theory in the field regarding electrification, I think that the interplay between the variables is overlooked and in this analysis I will attempt to bridge that gap.

Further, parties that have systems dominated by a single party have the ability or power to disenfranchise those who are less likely to vote for them. A prime example of this phenomenon would be the Jim Crow laws that disenfranchised black voters in the southern United States for much of the 20th century. Mechanisms such as voting tax or the requirement to

pass a literacy test to vote are prime examples of dominant parties disenfranchising potential opposition groups. However, while voter enfranchisement is highly important in South Africa, why are the benefits of water security not extended to provinces dominated by formally disenfranchised voters that are now comprised of the dominant party? In this analysis, I will include political competition and accountability in an attempt to understand why these benefits don't seem to apply to accessibility to improved water source.

Notably, the accountability created between elected local councils and the people through the process of decentralization is critical. However, the aforementioned processes, on their own, are not sufficient to improve the provision of public goods and services, but rather, collectively these approaches play an important role in the process. Ultimately, redistributive politics, institutions, governance, political competition and decentralization are all important variables worth considering when analyzing global water and sanitation accessibility.

Despite theoretical advances in the aforementioned fields, a great deal remains unfinished, to uncover the relationship between local government and the provision of public goods and services. In this analysis I will advance the literature by discussing the impact of locally elected municipal government on accessibility to improved water and sanitation. Likewise, I will uncover the conditions that impede, or advance, the accessibility of improved water and sanitation.

3 THEORY

In this analysis, building off the existing literature about electoral accountability, the heart of the theory is that locally elected democratic government creates a vital sense of responsibility between constituents and public servants. Accountability is built on decentralization of state power, which is crucial in opening the channels of communication

between a government and its population. However, decentralization alone does not suffice. Typically, when power is decentralized, this opens doors to government accessibility, which builds the foundations of trust between a government and its citizens. Essentially, locally elected officials are better able to identify the immediate needs of their community and thus can advance targeted policies focusing on their community's specific needs.

Decentralization is asserted to deliver many benefits to the public (Bardhan 2002). Often decentralization is advocated as a way to control the centralized state by minimizing the power that it holds (Bardhan 2002). By reducing the role of the central government, it enables space for increased intergovernmental competition, which leads to improved efficiency and responsiveness of the government (Bardhan 2002). Therefore, decentralization leads to increased accountability, as the citizenry are closer to the government. As a result, the local population is better able to monitor the actions of elected officials when they are local as opposed to when they are in the national capital (von Braun and Grote 2002). This improved relationship between the local government and constituents leads to improved delivery of public goods.

The accountability between public servants and constituents incentivizes government officials to provide adequate public goods and services to their respective population. Constituents hold elected officials accountable when they vote in support of candidates based on their previous actions while in elected office, and their future credible commitments following their (re)election (Democratic Linkages Project 2009). While not all citizens cast their vote according to political accountability, considerably sized factions influence the political outcome as long as elections are reasonably competitive. Mainly, "anticipating accountability considerations among voters and competition for office, politicians will try to act with 'responsiveness' to critical mass audiences (Democratic Linkages Project 2009, P.1)."

Essentially, political participation is important to elected officials and improving accountability between the elected officials and their local constituents increases participation.

Political competition is vital in the electoral process to establish accountability. Scholars such as Careaga and Weingast (2001) assert that increased amounts of political competition result in less corruption and thus improved provision of public goods and services. Essentially, "an incumbent's re-election odds provide a harsher constraint on policy decisions when competition is higher than when (s)he has a large electoral advantage (Ashworth et al. 2006)." Thus, with increased electoral competition, there is a credible threat to an incumbent's reelection and this risk impacts their policy choices and delivery of public goods and services.

Moreover, local government can procure the information advantage as a result of political accountability (Bardhan 2002). In countries that are democratic, locally elected officials are accountable to the local electorate (Bardhan 2002). The central government possesses a broader constituency base diluting their ability to understand the needs of local districts (Bardhan 2002). Research on electoral competition demonstrates that "low numbers of effective parties" may inhibit the delivery of public goods by reducing competition thus minimizing the risk of losing seats during elections, ultimately reducing the delivery of public goods and services (Min 2015:8). While previous research has focused on the size of the party system, much less attention has been paid to the "temporal stability of party systems" and even less frequently analyzed is the aforementioned theories in tandem with the accessibility to water and sanitation, which is what this analysis will accomplish (Min 2015:8).

Resulting from the high-value voters place on public goods, "delivering them creates electoral payoffs to the political actors who influence their provision" (Min 2015:21). During competitive elections, the necessity to earn votes is a powerful force that motivates politicians to

advance public goods and service delivery strategically (Banerjee and Hankla 2014). Essential public services such as electricity, water and education are of the utmost importance among the impoverished. Frequently, the impoverished are electorally abundant and resulting from their vulnerability, their votes can be influenced by providing these services (Min 2015).

Often electoral competition incentivizes elected officials to prioritize the distribution of public goods and services. In democratic states, the necessity for elected official to harness broad bases of support leads elected officials to commit to the provision of public goods in underserved communities (Banerjee and Hankla 2014). Scholars suggest that intermediate levels of party system size are optimal for public goods provision (Banerjee and Hankla 2014). When the size of party systems is below the intermediate range, however, competition is reduced and does not incentivize service provisions (Banerjee and Hankla 2014). On the other hand, when the levels are above the intermediate range, the system becomes fragmented leading to instability and then the inability to produce long-term beneficial outcomes (Banerjee and Hankla 2014). This analysis will extend this theoretical frame of thought to global water and sanitation accessibility.

It is important to understand under what conditions the aforementioned variables can lead to improved delivery of public goods and services. This investigation alleges that the benefits of decentralization are contingent on political competition that leads to improved accountability between the sub-national authorities and the local government. This combination of factors leads to the improved delivery of public goods and services.

3.1 Hypotheses

I have two main hypotheses that I will be testing in this paper:

H_1: Countries with democratically elected local governments will posses a higher percentage of their population living with accessibility to improved water and sanitation sources as opposed to alternative governments, other things equal.

H_2: Countries with increased levels of political competition will posses a higher percentage of their population living with accessibility to improved water and sanitation sources as opposed to alternative governments, other things equal.

4 METHODS

I will primarily utilize Martinez-Vazquez and Hankla's (2011) dataset for my independent variables and include indicators for political competition, and local government. Additionally, I will combine the aforementioned dataset with both the World Development Indicators (WDI) and the World Health Organization's Global Health Observatory (GHO) data for my dependent variables, including variables for improved water source, improved sanitation, and piped water accessibility. These databases were initiated as a research tool in cross-national comparisons of political economy as well as political institutions. Furthermore, these databases provide variables that are disaggregated, possessing the most comprehensive indicators for measuring local democratic government and water and sanitation accessibility available.

The indicators for local government, independent variable one and two, include: (1) the presence of municipal elections and (2) the presence of sub-national elections. Additionally, the indicator utilized for political competition, independent variable three, includes: (3) dominant

party systems.

The independent variables are indicator variables. *Municipal Elections* defined as the presence of elections at the local or municipal level, is coded as follows: the state receives a "0" if, municipal elections occur. The state receives a "1" if, municipal elections don't occur. Likewise, independent variable two, *Sub-national Elections*, defined as the presence of elections at the regional or state level is coded as: the state receives a "0" if, sub-national elections occur and the state receives a "1" if, sub-national elections don't occur. The measure of political competition employed, while arguably weak, can be measured cross-nationally. Essentially, this variable is a transformation of sub-national and municipal role of parties. The municipal role of parties measure denotes how independent municipal parties are from national parties. This variable is called, *Dominant Party System*, and is coded "1" when a dominant party always wins, and is thus considered less competitive. Whereas the state receives a "0" when the dominant party is not always elected, thus the elections are considered to be more competitive.

Moreover, the indicators that I am investigating for my dependent variable include: (1) accessibility to improved water source (2) accessibility to piped water and (3) accessibility to improved sanitation facilities. These variables are continuous variables measuring the percentage of a population with improved access to water, sanitation and piped water. To operationalize my dependent variables, I will utilize the following indicators: *Improved Water Source of Population, Improved Water Source of Rural Population*, *Improved Water Source of Urban Population*, *Improved Sanitation Source of Population*, *Improved Sanitation Source of Rural Population, Improved Sanitation Source of Urban Population,* and *Households using a Piped Water Source*. These variables are calculated as ratios of the number of households with improved accessibility to water and sanitation to the total number of households reflected as

household-weighted percentages. The WDI and GHO indicator data are based on the reanalysis of Demographic and Health Surveys.

The United Nations Children's Fund and World Health Organization Joint Monitoring Programme (JMP) define "an improved drinking-water source [as] one that, by the nature of its construction and when properly used, adequately protects the source from outside contamination (Joint Monitoring Programme 2016)." Piped water is also considered to be improved water source, is defined as households using piped water. However, piped water is more difficult to obtain then simply improved water source. Likewise, an improved sanitation facility is defined as " one that hygienically separates human excreta from human contact (Joint Monitoring Programme 2016)."

To test my hypotheses, I will be running a differenced random effects model utilizing robust standard errors to discover the relationship between local government and accessibility to improved water and sanitation sources. Likewise, I will also investigate the relationship between political competition and improved water and sanitation sources. My unit of analysis in this investigation is at the country level. I will conduct a cross-national study of 156 countries between the years of 1990 and 2007 as this timeframe has the most comprehensive data available. Finally, to minimize the chance of spurious relationships for emerging in this analysis, I control for Gross Domestic Product (GDP), GDP per capita, population density, and the percent of the population living in a rural area, which is calculated as the difference between total population and urban population.

5 FINDINGS

First, this section will discuss the factors impacting the percentage of the global population with access to improved drinking water. The first model reported is testing the relationship

between the improved access to drinking water and sub-national elections, controlling for GDP, GDP per capita, population density and the percent of the rural population. I utilize a differenced random effects model with robust standard errors to account for that fact that the variable, improved access to water overall, is trending.

Table 5.1 Percentage of People with Improved Access to Water Overall

	Differenced Improved Access to Water Overall
Lag Improved Access to Water Overall	.007**
	(.004)
Sub-national Elections	.081*
	(.043)
GDP Constant	-.000000009
	(.00000001)
GDP Per Capita	-.001
	(.001)
Population Density	-.00004
	(.0001)
Percent Rural Population	.015***
	(.003)
Constant	-.861 **
	(.426)
Observations	2444
Countries	156
Overall R^2	0.102

Random Effects estimates with robust standard errors in parentheses
P < 0.10 * (two-tailed)
P < .05 ** (two-tailed)
P< .01*** (two-tailed)

In this model the independent variable, sub-national elections, is statistically significant at the .10% level in influencing a change in accessibility to improved water source. In fact, when sub-national elections occur, the percentage of people accessing improved water source increases

by .081 percent. This indicates that the presence of sub-national elections has a statistically significant relationship with the improved access to water cross-nationally. Essentially, this means that people living in countries that have sub-national elections are more likely to have improved accessibility to water globally.

Table 5.2 Percentage of People with Improved Access to Water Overall

	Differenced Improved Access to Water Overall
Lag Improved Access to Water	.007**
Overall	(.004)
Municipal Elections	.055*
	(.034)
GDP Constant	-.000000005
	(.00000001)
GDP Per Capita	-.0005
	(.001)
Population Density	-.00005
	(.00007)
Percent Rural Population	.016***
	(.004)
Constant	-. 883 **
	(.432)
Observations	2444
Countries	156
Overall R^2	0.099

Random Effects estimates with robust standard errors in parentheses
P < 0.10 * (two-tailed)
P < .05 ** (two-tailed)
P< .01*** (two-tailed)

This model differs from the previous model in that the independent variable, *Sub-national Elections*, is substituted for the variable, *Municipal Elections*. I can infer from this model that the presence of municipal elections increases the likelihood of accessibility to improved water source. In fact, in states with locally elected municipal governments the

likelihood of access to improved drinking water increases by .055 percent. This indicates that the presence of municipal elections has a significant relationship with improved access to water cross-nationally.

Table 5.3 Percentage of People with Improved Access to Water Overall

	Differenced Improved Access to Water Overall
Lag Improved Access to Water Overall	.006*
	(.004)
Municipal Elections	.035
	(.032)
Sub-national Elections	.061*
	(.040)
GDP Constant	-.000000007
	(.00000001)
GDP Per Capita	-.0008
	(.002)
Population Density	-.00004
	(.00007)
Percent Rural Population	.015***
	(.003)
Constant	-.857**
	(.428)
Observations	2444
Countries	156
Overall R^2	0.107

Random Effects estimates with robust standard errors in parentheses
P < 0.10 * (two-tailed)
P < .05 ** (two-tailed)
P< .01*** (two-tailed)

In this model I tested the relationship between the improved access to drinking water and municipal and sub-national elections. This model reflects that the percentage of people with accessibility to improved drinking water remains significant at the .10% level when there are sub-national elections. Specifically, the presence of sub-national elections is associated with a .061 percent increase in improved water accessibility. However, the impact of municipal elections is not significant. I speculate this could be a result of the overlap of responsibilities

between sub-national and municipal governments. Likewise, it seems that sub-national elections are more of the global long-term standard, whereas devolving power to municipal authorities is more of a recent phenomena, thus rendering the results insignificant.

Table 5.4 Percentage of People with Improved Access to Water Overall

	Differenced Improved Access to Water Overall
Lag Improved Access to Water Overall	.002 (.004)
Dominant Municipal Party System	.031 (.028)
GDP Constant	.000000009 (.000000006)
GDP Per Capita	-.001 (.002)
Population Density	-.0003 (.0002)
Percent Rural Population	.012 *** (.003)
Constant	-.258 (.440)
Observations	1689
Countries	129
Overall R^2	0. 250

Random Effects estimates with robust standard errors in parentheses
P < 0.10 * (two-tailed)
P < .05 ** (two-tailed)
P< .01*** (two-tailed)

This model is testing the relationship between the improved access to drinking water overall and dominant municipal party system, controlling for GDP, GDP per capita, population density and the percent of the rural population. In this model I also utilize a differenced random effects model with robust standard errors. This model reflects that no variable of interest seems

to be significant. This likely is a result of a potentially problematic indicator for political competition. I think that to further investigate this particular variable a case study should be utilized to view political competition at a more nuanced level.

Table 5.5 Percentage of People with Improved Access to Water in Rural Areas

	Differenced Improved Access to Water Rural
Lag Improved Access to Water Rural	.011***
	(.004)
Municipal Elections	.124***
	(.050)
Sub-national Elections	.065
	(.057)
GDP Constant	.000000004***
	(.00000001)
GDP Per Capita	-.005*
	(.003)
Population Density	-.001***
	(.0002)
Percent Rural Population	.010***
	(.004)
Constant	-. 609
	(.421)
Observations	2427
Countries	155
Overall R^2	0.001

Random Effects estimates with robust standard errors in parentheses
P < 0.10 * (two-tailed)
P < .05 ** (two-tailed)
P< .01*** (two-tailed)

In this model I am testing the relationship between the improved access to drinking water in rural areas and municipal and sub-national elections. I continue to control for GDP, GDP per capita, population density and the percent of the rural population and utilize a differenced random effects model with robust standard errors. This model indicates that there is only one

significant independent variable of interest, which includes, municipal elections. In fact, the presence of municipal elections increases the accessibility to water in rural areas by.124 percent. I would speculate that municipal elections are particularly influential in rural areas, as often the benefits of sub-national elections will trickle down to urban areas whereas rural areas often are the last to receive benefits from the central governments.

Table 5.6 Percentage of People with Improved Access to Water in Urban Areas

	Differenced Improved Access to Water Urban
Lag Improved Access to Water Urban	.007
	(.003)
Municipal Elections	.035
	(.032)
Sub-national Elections	.061*
	(.040)
GDP Constant	-.000000007
	(.00000001)
GDP Per Capita	-.001
	(. 001)
Population Density	-.00004
	(.00007)
Percent Rural Population	.015 ***
	(.003)
Constant	-.856 **
	(.428)
Observations	2444
Countries	156
Overall R^2	0. 107

Random Effects estimates with robust standard errors in parentheses
P < 0.10 * (two-tailed)
P < .05 ** (two-tailed)
P< .01*** (two-tailed)

This model differs from the previous model in that the dependent variable, improved access to water in rural areas, is substituted for urban areas. I can infer from this model that sub-

national elections increase the likelihood of accessibility to improved drinking water in urban areas by .06 percent. In this model I analyzed the relationship between the percentage of people with improved access to water in urban areas on sub-national and municipal elections, however, the latter variable did not report significant findings. As I previously mentioned, I think that this insignificance in municipal elections is perhaps a result of being overshadowed by the more encompassing variable, sub-national elections as when this model is ran with both variables separately, both variables report significant finding at the .10 percent level.

Table 5.7 Percentage of People with Improved Access to Sanitation Overall

	Differenced Improved Access to Sanitation Overall
Lag Improved Access to Sanitation Overall	.006*
	(.003)
Municipal Elections	.031
	(.044)
Sub-national Elections	.075*
	(.044)
GDP Constant	-.000000005
	(.00000001)
GDP Per Capita	-.0031
	(.002)
Population Density	.000002*
	(.00003)
Percent Rural Population	.006
	(.004)
Constant	-.271
	(.365)
Observations	2417
Countries	156
Overall R^2	0.001

Random Effects estimates with robust standard errors in parentheses
P < 0.10 * (two-tailed)
P < .05 ** (two-tailed)
P< .01*** (two-tailed)

In this model I investigate the relationship between the accessibility to improved sanitation facilities overall and municipal and sub-national elections controlling for GDP, GDP per capita, population density and the percent of the rural population. Likewise, I utilize a differenced random effects model with robust standard errors, as improved access to sanitation is also a trending variable. Sub-national elections have a significant relationship with improved access to sanitation facilities, with p-values below 0.10. In fact, when there are sub-national elections, improved access to sanitation overall increases by .075 percent. I suspect that the role of municipal elections is not reported as significant because efforts to improve sanitation via local municipal government are recent developments and may not be accurately reflected by the data.

Table 5.8 Percentage of People with Improved Access to Sanitation Rural

	Differenced Improved Access to Sanitation Rural
Lag Improved Sanitation Rural	.013 **
	(.004)
Municipal Elections	.029
	(.056)
Sub-national Elections	.101*
	(.057)
GDP Constant	-.00000002
	(.00000002)
GDP Per Capita	-.003
	(.004)
Population Density	-.0002
	(.0002)
Percent Rural Population	.007
	(.005)
Constant	-.634
	(.478)
Observations	2414
Countries	156
Overall R^2	0. 014

Random Effects estimates with robust standard errors in parentheses
P < 0.10 * (two-tailed)
P < .05 ** (two-tailed)
P< .01*** (two-tailed)

Sub-national elections have a significant relationship with improved access to sanitation facilities in rural areas, with p-values below 0.10. In fact, the presence of sub-national elections increases the accessibility to improved sanitation facilities by .101 percent. As previously mentioned, this is not particularly surprising, as I suspect that central governments have been responsible for sanitation facilities for much longer than local municipal governments thus potentially impacting the results of the model.

Table 5.9 Percentage of People with Improved Access to Sanitation Urban

	Differenced Improved Access to Sanitation Urban
Lag Improved Access to Sanitation Urban	.005 (.004)
Dominant Municipal Party System	.067* (.046)
GDP Constant	-.000000004 (.000000004)
GDP Per Capita	-.0002 (.001)
Population Density	.000004 (.0002)
Percent Rural Population	-.0003 (.002)
Constant	-.145 (.267)
Observations	1689
Countries	129
Overall R^2	0. 095

Random Effects estimates with robust standard errors in parentheses
P < 0.10 * (two-tailed)
P < .05 ** (two-tailed)
P< .01*** (two-tailed)

In this model I investigate the relationship between the accessibility to improved sanitation facilities in urban areas and dominant municipal party system. This model indicates that the variable dominant municipal party system is significant when the p-value is below .10

percent. In fact, in countries where there are dominant municipal party systems, improved sanitation accessibility in urban areas increases .067 percent. Contrary to my expectations, this indicates that political competition does not seem to have s significant relationship with improved sanitation in urban areas as it showcases significance when dominant parties have less competition. I also ran this same model with both sub-national elections and municipal elections separately. While municipal elections did not report significant findings, sub-national elections did in fact indicate a significant relationship with improved access to sanitation facilities in urban areas with p-values below 0.10.

Table 5.10 Percentage of People with Access Piped Water

	Access to Piped Water Overall
Sub-national Elections	.914
	(4.024)
Municipal Elections	-.934
	(4.023)
GDP Constant	-.000004
	(.000017)
GDP Per Capita	.884
	(.942)
Population Density	-.007
	(.014)
Rural Area	-.708***
	(.180)
Constant	85. 470 ***
	(14.205)
Observations	131
Countries	58
Overall R^2	0.533

Random Effects estimates with standard errors in parentheses
P < 0.10 * (two-tailed)
P < .05 ** (two-tailed)
P< .01*** (two-tailed)

This model investigates factors impacting the percentage of households globally with access to piped water. The first model reported is testing the relationship between piped water accessibility and municipal and sub-national elections, controlling for GDP, GDP per capita, population density and the percent of the rural population. In this analysis I utilize a regular random effects model, as there is insufficient data for a differenced model with robust standard errors. From the regression we can see that there are no statistically significant independent variables. However, I suspect that the insignificant results were an effect of the scarcity of available data on piped water accessibility. Thus, this particular model must be revisited when data availability is more comprehensive.

Table 5.11 Percentage of People with Access Piped Water

	Access to Piped Water Overall
Dominant Municipal Party System	7.737
	(7.300)
GDP Constant	-.0000005
	(.000016)
GDP Per Capita	-.463
	(1.053)
Population Density	-.011
	(.014)
Percent Rural Population	-1.000***
	(.207)
Constant	107. 200 ***
	(15.930)
Observations	96
Countries	44
Adjusted R^2	0.590

Random Effects estimates with standard errors in parentheses
P < 0.10 * (two-tailed)
P < .05 ** (two-tailed)
P< .01*** (two-tailed)

This model also investigates factors impacting the percentage of households globally with access to piped water. This model is testing the relationship between piped water accessibility and dominant municipal party system, controlling for GDP, GDP per capita, population density and the percent of the rural population. Again, in this analysis I utilize a regular random effects model, as there is insufficient data for a differenced model with robust standard errors. This model also reflected that there is no variable of interest that has a significant effect on the percentage of households with piped water accessibility. One possible factor impacting the results could be the scarcity of household piped water data. Given that there are no variables of interest in the model that are significant, this model should be revisited when more data is available.

Table 5.12 Percentage of People with Access Piped Water

	Improved Access to Piped Water Overall
Sub-national Elections	4.325
	(4.996)
GDP Constant	-.000005
	(.00002)
GDP Per Capita	-.571 **
	(1.063)
Population Density	-.009 **
	(.0142)
Rural Area	-1.002 ***
	(.208)
Constant	106.488 ***
	(16.024)
Observations	131
Countries	58
Overall R^2	0.596

Random Effects estimates with standard errors in parentheses
P < 0.10 * (two-tailed)
P < .05 ** (two-tailed)
P< .01*** (two-tailed)

This model also investigates factors impacting the percentage of households globally with access to piped water. This model is testing the relationship between piped water accessibility and sub-national elections, controlling for GDP, GDP per capita, population density and the percent of the rural population. In this model I continue to use a regular random effects model, as there is insufficient data for a differenced model with robust standard errors. In this model there are no independent variables of interest that are statistically significant in influencing the accessibility to piped water. Based on this, I can infer that when analyzing the role sub-national elections the percent of households with accessibility to piped water source will not be significantly impacted. However, resulting from the fact the piped water accessibility has only recently starting being tracked, this model should be revisited when more data is available.

Overall, the empirical models reflect several significant findings. Particularly, the role of municipal and sub-national elections on improved accessibility to water and sanitation is notable. In fact, the presence of municipal elections (*Municipal Election)* is statistically significant across multiple models, and in two out of the seven models reported in this analysis that test municipal elections as the independent variable. In particular, the municipal elections variable is highly significant when analyzed with accessibility to improved water source in rural areas. Indicating that local municipal government plays an important role in the accessibility to improved water source in rural areas. I would speculate that this is in part a result of increased levels of accountability between smaller populations and their municipal government.

Furthermore, municipal elections, is also significant when analyzing accessibility to improved water source overall. Indicating that again, the presence of municipal elections does seem to have a significant impact on the accessibility to improved water source globally. It is notable that in instances, when I analyze models with both sub-national elections and municipal

elections, the results for municipal elections are often rendered insignificant. I speculate that this could be a result of the variable municipal elections being overshadowed by the sub-national election variable, as often regional and national elections have stood the test of time whereas municipal elections are more recent phenomena. However, I am confident that these significant findings are not circumstantial and indicate the need for further research and development in understanding the relationship between local municipal government and accessibility to improved water and sanitation facilities cross-nationally.

Likewise, the presence of sub-national elections (*Sub-national Elections*) is statistically significant across multiple models and specifically in five of the eight models reported in this analysis that test sub-national elections as an independent variable. Primarily, this model is significant when looking at improved access to water overall, improved access to sanitation overall as well as when looking specifically in rural and urban areas. I think this significance clearly indicates that sub-national elections are highly important globally and have clear implications in the water and sanitation sector. Essentially, looking forward I think this finding means that sub-national elections impact various facets of society including water and sanitation and thus should be duly considered in the analysis of public goods and service delivery.

Finally, of the three models where *Dominant Party System* was the independent variable, only one model revealed significant findings. However, the low levels of statistical significance could be a result of utilizing a broad and potentially problematic indicator for political competition. The model that reported significant findings with the dominant party system includes improved access to sanitation in urban areas, which was actually contradictory to my expectations indicating that dominant municipal party systems leads to increased accessibility to sanitation in urban areas. However, in the future, I think political competition needs to be further

developed by scholars in terms of identifying the relationship between this variable and water and sanitation sector. Moreover, in regard to piped water accessibility, at this time, the data is insufficient to draw definitive conclusions. Thus piped water accessibility should be further developed in the future when data accessibility is readily available.

6 CONCLUSION

Sanjay Wijesekera, head of the United Nations Children's Fund (UNICEF) global water, sanitation and hygiene (WASH) program remarked that a "lack of sanitation is a reliable marker of how the poorest in a country are faring" (UNICEF 2014). The consequences of lack of sanitation and water accessibility are widespread and pervasively impact vulnerable populations. The influence of local government on accessibility to improved water source and sanitation will continue to be a salient issues in academia and global policy. The key question is whether local government and political competition will lead to improved accessibility to water and sanitation sources. While results in the literature vary substantially, it is undeniable that local government plays an important role in the provision of public goods and services.

This analysis tests two primary hypotheses. My primary hypothesis draws on existing literature to theoretically reason that the presence of elections increases water accessibility. Through my analysis of 156 countries, this study supports the primary hypothesis through random effects analysis across a number of models. Regarding the second hypothesis, pertaining to political competition leading to improved accessibility to water and sanitation, the findings were inconclusive indicating a need for further research and development. While there is space for further research in development regarding the interplay between political competition, governance and the accessibility of improved water and sanitation, this paper is but a small step in revealing the importance of local democratic government and its interplay with the delivery of

public goods and services.

In light of the SDG's recognizing water and sanitation and the international community moving toward piped water accessibility as the standard for improved water source, data availability on this topic will soon be forthcoming. Scholars should continue to advance research on water and sanitation issues, as they will only increase in importance. Essentially, my findings indicate that sub-national and municipal government officials are better able to identify the needs of their community and provide accessibility to improved water and sanitation. Likewise, it seems that countries that possess sub-national or municipal elections also have corresponding increased government responsiveness in the water and sanitation sector. This suggests that there is a role for both municipal and subnational government in ensuring that the preferences of citizens are reflected in policy. It is my hope that this analysis is a step toward understanding the integral relationship between local government and the delivery of public goods and services in the water and sanitation sector.

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