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The Implications of Water Insecurity for Fragile and Failing States: The Case of Pakistan

Jennifer Norins
University of Massachusetts Boston

THE IMPLICATIONS OF WATER INSECURITY FOR FRAGILE AND FAILING STATES: THE CASE OF PAKISTAN

A Thesis Presented

by

JENNIFER NORINS

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Approved as to style and content by:

_____

Dr. Robert Weiner, Professor, Political Science
Chairperson of Committee

_____

Leila Farsakh, Associate Professor, Political Science
Member of Committee

_____

Michael Keating, Director of Operations and Senior Fellow,
Center for Peace Development and Democracy
Member of Committee

_____

Robert Weiner, Program Director
Master of Science in Public Affairs – IRTrack

_____

Eben Weitzman, Chairman
Department of Conflict Resolution, Human Security
and Global Governance

ABSTRACT

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FRAGILE AND FAILING STATES: THE CASE OF PAKISTAN

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Jennifer Norins, B.A., University of Massachusetts Boston
M.S., University of Massachusetts Boston

Directed by Professor Robert Weiner

As we become more firmly established in the 21st century, the international system faces a number of increasingly more difficult challenges that pose threats to global security and human progress. Among these challenges, water scarcity and failing states have each received prominent attention in both the academic and policy realms. Water serves a number of critical purposes for human survival and socio-economic activity. The threat of water scarcity is becoming increasingly salient and the capacity of states to ensure water security, and other securities which water security supports, is being tested. Fragile and failing states also occupy significant space in the discourse of international security, because as governless places, these states are linked to abhorrent civil violence, terrorism, trafficking of arms, and drugs and other illicit goods and services, all of which threaten regional and global security. Using the case of Pakistan, this thesis will demonstrate the interconnections between water security and state strength, explicating the ways in which water security underpins economic development,

human development and security, and bolsters state institutional capacity. As a state that exhibits both weak state features and water insecurity, Pakistan provides a demonstration of how the absence of water security makes tenuous the stability and capacity of an already fragile state.

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CHAPTER 1

INTRODUCTION AND METHODOLOGY

As we become more firmly established in the 21st century, the international system faces a number of increasingly more difficult challenges that pose threats to global security and human progress. Among these challenges, water scarcity and failing states have each received prominent attention in both the academic and policy realms. Water has been noted to be the major resource issue of the 21st century (Homer-Dixon, 1999), the key resource over which wars will be waged (Serageldin, 2009), and the degradation and decline of which is likely to be "the most underappreciated global environmental challenge of our time" (WorldWatch Institute, quoted in Barlow, 2007). Moreover, the salience of the unsustainability of current human exploitation of water sources has become difficult to ignore (Evans, 2010), as lakes and rivers are visibly shrinking and boreholes and tubewells dig deeper into the earth to access water. Water serves as a critical element in nearly every socio-economic activity and is essential for sustaining biological life. The imposing threat of water scarcity places immense pressures on the capacity of states to ensure water security for economic and human development. For many places around the world, ensuring access to sufficient amounts of water is becoming an issue of high priority, and is aggravating tensions over shared water sources, both within and between states (Gleick, 2009).

Likewise, fragile and failing states occupy significant space in the discourse of international security, because scholars and policy makers identify such states as a persistent threats to regional and global security to which the international community has not be adequately able to respond (Brooks, 2005: 1164; Ellis, 2005: 135; Langford, 1999: 59). The apprehension with failed states has been that, as governless places, such states are unable to secure their borders, provide a security guarantee for their population, and meet their international obligations. Failed and fragile states have been linked to terrorism (Piazza, 2008; Rotberg, 2004), trafficking of arms, drugs and other illicit goods and services (Patrick, 2007; Rotberg, 2002a, 2004), and persistent poverty (Collier, 2007). Failed states do not conform to the expectations of stateness and therefore defy many of the standard "conceptual and operational frameworks" of international relations (Langford, 1999: 59) regarding state behavior and the functioning of the international system.

Individually, the consequences of water scarcity or of state failure are significant. Water scarcity frustrates the development potential of economies and hampers the well-being of people living within the affected states. Water scarcity intensifies intergroup animosities, heightens demands on states to compensate, and threatens food security and livelihoods. Similarly, the process of state failure upsets the political, economic and social foundations of a state, creates environments of massive personal insecurity, and impedes human development. The implications of water scarcity and state failure each exemplify the premise behind the theory of the security-development nexus, which asserts that security and development are mutually reinforcing, such that development

cannot occur in the absence of state and human security. In the case of water, the inability of the state to ensure sufficient quantities of quality water to meet current and future water needs inhibits its development potential and negatively impacts other security issues. The connection between insecurity and lack of development is also strikingly clear in failed states, where human and state security are dubious and economic and human development stunted.

Yet, the literature lacks sufficient analysis of the interconnections between water insecurity and the causes and indicators of state failure. Within the literature on water scarcity and water security, concession has been made regarding the increased difficulties facing failing states, there is minimal analysis of what those difficulties entail. The state failure literature dedicates little attention to water issues, or even of the broader area of environmental stress. In the major indices of state failure, the role of water is defined narrowly, measured only in terms of percentage of population with access to freshwater (Goldstone et al, 2004), if it is identified as a factor at all. While this indicator provides a meaningful approach for determining the extent to which a country is experiencing water stress, it minimizes the critical role of water in underpinning human and economic development.

Some research has been carried out that explores the causal relationship between resource scarcity and civil violence. This work asserts that resource scarcity increases the structural imbalances between groups within a society, which amplifies antagonism between groups and increases the sense of a security dilemma (Homer-Dixon, 1999; Kahl, 2006). However, there has been limited research focusing specifically on the ways

in which water insecurity undermines state strength and potentially provokes failure. Considering the mounting concern regarding intensifying water scarcity as well as increasing occurrences of water-related disasters, and considering the likelihood that such water-related challenges will occur in politically and economically weak states, this area of research is of major import. Directly linking the consequences of water insecurity to the causes of state failure should redirect international attention to the importance of water for promoting human and state security.

This thesis proffers an analysis of the interconnections between water insecurity and state failure. Water is an essential resource, in that water acts as the basis for all life and serves as a critical input for almost every economic activity. Water security, which can be defined as ensuring sufficient quantities of quality water to meet current and future water needs through the development of adequate infrastructure and institutions, underpins human and economic development. Moreover, water security strengthens the political and economic stability of both the state and region. In contrast, water insecurity undermines many of the critical political, economic and social factors that promote positive state-society cohesion and state stability. Failing states are more likely experience the ill-effects of water insecurity, because they are plagued with weak institutional capacity and feeble political will to establish an efficient and equitable water management system that ensures the availability of water for human and economic development. Such states may be tested to the point of failure when water-related challenges require the ability to quickly respond and adapt.

The case of Pakistan will be used to demonstrate the ways in which water insecurity undermines many of the critical political, social, and economic factors that promote state stability and development. As a semi-arid to arid country, Pakistan already experiences water stress, due to inefficient irrigation systems and dwindling resources to meet growing demands. Pakistan is also a state that has been on the brink of failure since its inception in 1947. Heavily militarized, Pakistan prioritizes its external security over the development and security of the individuals living within its borders. Pakistan has low levels of human development and increasing internal discontent. In addition, the rising strength of the radical Islamist groups, the state's tacit support for terrorist groups and the Taliban, and its nuclear technology heighten international concerns about the potential threat that a failed Pakistan poses to global security. In effect, Pakistan is one of the most insecure security states. Given the confluence of both water insecurity and clear indicators of state failure, Pakistan provides a useful case for exploring the implications of water insecurity on failing states.

Methodology

To demonstrate the ways in which the phenomena of water insecurity and failed states interact, this thesis will involve a review and analysis of the literature on water security and water scarcity, water and conflict, state failure, and the security and development nexus. Using secondary sources, chapter two will discuss the importance of water for development and the challenges facing countries world-wide in establishing water security. In this chapter, a review and analysis of the literature will be presented

regarding the definitions of water security in terms of state security and human security, the nexus between security and development, and critical water security issues facing countries on a global scale, such as water scarcity. In addition, chapter two will include a discussion of the concept of hydropolitics and the debate regarding the connection between water and conflict at both the international and subnational scale.

Chapter three will consist of a review and analysis of the current literature on state failure, including a comparative analysis of major indices of state failure to identify the common factors that predict and distinguish state failure. In addition, chapter three will present the thesis of how water security supports state strength. This analysis will include a review of the current work that links environmental stress to civil violence, but will attempt to demonstrate that the interconnections between water security and state strength occur at deeper levels.

Chapter four will present the case of Pakistan as a means of explicating the connection between water insecurity and state failure. The chapter will first describe the political, economic and societal factors of the country that underscore why Pakistan has been consistently identified as a failing state. The chapter will then discuss the extent to which Pakistan is water insecure, and the various external and internal challenges it faces in regards to its water security. The chapter will end with an analysis that links the Pakistan's political, economic and societal challenges with Pakistan's water insecurity and will make assertions regarding the future of the state's stability if it continues to falter on establishing water security.

CHAPTER 2

WATER

Water is an essential element for biological life and acts as a critical input in nearly every socio-economic activity. For centuries human civilizations have been appropriating and exploiting water resources for the purposes of development and public health. Indeed, the ability of a country to obtain and manage fresh water resources for such purposes represents a critical aspect of state functioning and a matter of survival. However, in recent years the availability and quality of water resources have been noticeably compromised, an indication of rapid industrialization and unsustainable development. Water scarcity has become a common threat for many countries around the world. Water tables are dropping, some of the world's largest rivers to no longer reach their deltas, and industrial effluents and human waste are causing severe deterioration of water quality in rivers and streams (Clarke, 1993; Mitchell, 2007; Postel 1996, 2000). These challenges raise fears that the earth is running out of water.

In actual fact, the earth is abundant in water. Over 1 billion cubic kilometers of water flows on the planet, accounting for over 70% of the earth's total surface area (Clarke, 1993; Jackson et al. 2001). Nearly all of this water is unusable or inaccessible for human consumption because it is either saline or stored in glacier icecaps (Jackson et al., 2001; Palaniappan & Gleick 2009). Freshwater sources, such as rivers, lakes, and wetlands amount to less than 0.05% of the earth's water (Clarke, 1993; Jackson et al.,

2001; Mitchell, 2007; Postel 2000). Yet, even this small amount would meet all human and ecosystem needs if it was evenly distributed. As water expert Sandra Postel explains, the global hydrologic system yields ample amounts of fresh water each year to sustain the world's population at its current level (Postel, 2000). In absolute terms, therefore, there is no shortage of water.

However, water is not uniformly distributed over time or geography (Clarke 1993; Gleick 1993, 1998; Grey and Sadoff, 2007; Postel, 2000). While some regions of the world experience consistent precipitation throughout the year, other regions undergo extreme variations in weather patterns that make difficult the ability to store and manage water resources. Geographic variation in climatic systems and the dispersion of rivers and lakes across the earth's surface create distinct regional differences in the availability of water resources. Some regions of the world are rich in water resources, while others possess very little. According to the Economist, Brazil, Canada, Colombia, Congo, Indonesia, and Russia comprise nearly 60% of global freshwater sources (For want of a drink, May 22, 2010). In contrast, China and India, with over a third of the world's population, possess less than 10% of the world's water (For want of a drink, 2010). Given the rapidity of their economic growth, these two countries are struggling with identifying means of attaining their water needs.

In addition to such regional variations in hydrologic endowments, the experience of water shortages is impacted by the level of demand placed on water resources. Though the total amount of water is immense, water is also a finite resource, meaning that the amount of water in the hydrologic system has been constant throughout the

earth's history (Palaniappan and Gleick, 2009). The rising global population and increases in global consumption habits have made the fixed water resource pie smaller. However, the experience of water shortages at the human level is largely dependent on the individual's level of physical and economic access to water resources.

Given the critical importance of water for all functions of society, water insecurity has the potential to undermine the political-societal stability of states. Water insecurity refers to the lack of sufficient water to meet all requisite water needs as well as inability to adapt to major water disasters. The constraints on water availability and water quality are becoming increasingly tight, as key regions of the world experience exponential rates of population growth, expanding consumption patterns, deteriorating water sources, and the uncertain impacts of climate change. These global challenges are causing some countries to experience water stress, an extreme form of water insecurity. These circumstances require societies to adapt rapidly. However, many of the countries that will experience the greatest water stress also lack the governance capacities to adequately adapt to the dynamic disparity between supply and demand. In these places, water insecurity will likely act as a critical risk factor that may cause weak states to fail.

This chapter will focus on the relationship between water security and economic and human development. To do this, the necessary background information will be presented on the importance of water for economic and human uses. In addition, the concept of water security will be discussed. The chapter will further elaborate on the connection between water security and development by discussing the concept of the

security-development nexus and then by reviewing two major areas of water insecurity: water scarcity and water-related conflicts.

The Versatility of Water's Uses

Water is the basis for all life and serves as a critical input for nearly every social and economic activity in which humans engage, including human health, food production, sanitation, energy production, and the manufacturing of many goods and services. Water is also essential for the healthy functioning of ecosystems that support the planet (Postel, 2000). Water's versatility of uses explains both water's social and economic import (WWDR 3, 2009), as well as the view that water is a source of contention (Gleick, 1993; Wolf, 1999). Specifically, concern exists regarding the extent to which water use is a zero-sum game between various social, ethnic or economic entities (Gleick, 1993). Water use is often discussed in terms of human or domestic use, agricultural use, and industrial or manufacturing use (Clarke, 1993; Gleick, 1998; Hunt 2004; World WDR, 2009). Contentions between groups may arise when one sector perceives another sector as limiting the overall quantity and quality of a shared water source. This section will present the basic discussion regarding water's versatility of uses, including human use, agricultural use and industrial use, and the relationship between water development, economic development and human security.

Water for human use represents the most essential function of water. Human bodies are composed primarily of water, and therefore human survival requires a basic amount of water to replenish fluids that are lost through respiration, excretion, and

evaporation from the skin (Gleick, 1996; Hunt, 2004). Because of the critical importance of water for human survival, water has been identified as a basic human right (Gleick, 1996; Human Development Report 2006; Palaniappan, 2009). Yet, approximately one billion people do not have proper access to safe drinking water, despite efforts to decrease this number by 2015 (Human Development Report, 2006; Jackson et al, 2001; Palaniappan, 2009). Over the past two decades there has been discussion about establishing a minimum water requirement for domestic use as a way of addressing the disparity between the absolute necessity of water and the number of people worldwide who lack adequate supplies of water for their basic needs. The suggested estimates fluctuate depending on what activities are included in the concept of domestic use and when the estimate was offered (Clarke, 1993; Human Development Report 2006; WWDR3, 2009). Gleick (1996) has provided one of the most cogent assessments of the amount of water required to adequately support an individual's health and overall well-being. In reviewing both the physiological needs and the regional and national variation in the amount of water used for drinking, basic sanitation, bathing and food preparation, Gleick (1996) offers a basic water requirement of a minimum of 50 liters/person/day. Water for sanitation and personal hygiene comprises the bulk of Gleick's assessment of a basic water requirement, representing 35 liters/person/day, while water for drinking accounts for five liters (Gleick, 1996). As will be discussed later, the actual amount of water appropriated for domestic use varies by country, depending on its level of development (Clarke, 1993; Gleick, 1996; WWDR 2009).

While water for human use has been recognized by many as the most critical of water's functions (Gleick, 1996; Postel, 2000; Watkins, 2006; WWDR, 2009), water is also a necessary input in nearly all economic activity, including agricultural production and manufacturing and industrial activities. Of the various economic sectors, agriculture consumes the largest percentage of water, averaging 70% of global water use and accounting for at least 90% of water withdrawals in many developing countries (FAO, Water at a Glance; Wolf, 1999; WWDR-3, 2009 ;). Countries dedicate so much water resources to agriculture out of necessity, because it bolsters food security and ultimately human development. Although humans require approximately five liters of water a day for hydration, between 2,000-5,000 liters of water is needed to produce an individual's daily food intake (FAO, Water at a Glance). In the early 1990's, Clarke indicated that 1000 cubic meters of irrigated water were required to produce one ton of plant growth, and that watering crops required "3300 cubic kilometers of water a year – roughly six times the requirement for industrial and domestic uses" (1993: 27). His estimates remain current approximations for the amount of water used to produce grains and other cereals (FAO.org). Meat and dairy products are considerably more water-intensive than other agricultural products; the Food and Agriculture Organization estimates that approximately 16,000 liters of water is employed in the production of one kilogram of grass-fed beef (FAO.org).

The high proportion of water input per agricultural unit reflects the amount of water lost during the agricultural process. While irrigation significantly increases crop yields by over 100% (FAO Water at a Glance), inefficiencies in some irrigation methods

result in substantial water loss. According to Postel (1997), many farmers irrigate their fields by flooding or channeling water across their crop area, which uses excessive amounts of water and often results in water-logging and salinity. These two related problems compromise the fertility of the land by washing out necessary nutrients in the soil and leaving a layer of salt after the water evaporates. Leaks in irrigation pipes and unlined canals also result in unintended water loss. Postel (1997) notes that the efficiency of irrigation systems worldwide is less than 40%. In addition, nearly half of the waters employed in irrigation are lost due to the process of evapotranspiration (Jackstone et al. 2001:1035), which occurs when water evaporates off of plant life and returns to the environment in the form of CO_2. Thus water used for agriculture is ultimately consumed, because it is withdrawn from the immediate hydrologic environment and cannot be employed by other users (Palaniappan and Gleick, 2009; WWDR-3, 2009).

Industry represents the final major sector for which humans appropriate water. Overall, industry and manufacturing account for 10-20% of water resource use, though amounts vary by industry (Hunt, 2004; Postel, 1997). Industrial use of water comprises both direct and indirect use. Direct uses of water for industrial activities include the exploitation of water as an input or as part of the processing of the manufactured good or service. For example, producing a ton of steel requires nearly 300 tons of water (Postel, 1997:136). The production of beverages like Coca-Cola uses at least 2.5 liters of water for one liter of refreshment (Coca-Cola, 2008), though this estimate likely does not account for the amount of water used in the production of other primary ingredients, such

as sugar cane. Energy production, such as in nuclear power plants or geothermal plants, require enormous amounts of water as a cooling agent (Hunt, 2004). Indirect use of water includes the contamination of local water sources due to industrial effluents (Clarke, 1993; Hunt, 2004). While much of the water that serves as a direct input to the manufacturing of the good or service is returned to local hydrologic environment, industrial pollutants significantly degrade the quality of the water. Clarke (1993) estimates that 450 cubic kilometers of waste water are discharged into rivers and streams each year, which further requires over 6000 cubic kilometers of fresh water to cleanse the system.

Variations in aggregated water use across countries are huge. For example, the per capita domestic water use in the United States is over 575 liters per day, while per capita water use in Germany is below 200 liters per day, and in most developing and underdeveloped countries the level is below 50 liters per day (Watkins, 2006). These variations reflect differences in the availability and accessibility of natural water resources, as well as the country's level of economic development. Arid and semi-arid countries typically withdraw more water than countries in more temperate or tropical climates (WWDR-3), particularly for food production. In addition, countries that are heavily reliant on the agricultural sector appropriate more water for agricultural purposes, while industrialized countries apportion 50 to 80% of their country's water budget for industry and manufacturing (Postel, 1997; WWDR-3). As countries move toward more industrialization, decisions are required as to how to balance competing water needs.

Water Security as a Prerequisite for Development

Given the import of water as an input in economic activity, a clear link arises between water infrastructure development and economic development (Grey and Sadoff, 2007; WWDR 2009). Since the earliest civilizations, societies have established formal and informal systems to utilize natural waters to meet their needs, including irrigation systems, cisterns and water harvesting systems, and large scale dams and reservoirs (WWDR, 2009). The inconsistencies of the hydrologic cycle and the variable distribution of rain and surface waters required societies to develop mechanisms for accessing, storing, and distributing water for food production and other basic uses (Clarke, 1993; Hunt, 2004). As populations grew and economies expanded, planners and policy makers recognized that the development of adequate water infrastructure was critical for the viability and progress of the country. For example, in 1909 William McGee, past Secretary of the US Inland Waterways, argued that the proper control of water and the establishment of water management systems would result in vast savings and improved economic development, including cheaper energy production, improved river navigation and transportation, and increased farm production (McGee, 2010: 90). McGee's foresight into the value of water resource management as a tool for national economic development creates a foundation for placing water as a priority for national security.

More recently, World Bank economist David Grey and his collaborator Claudia Sadoff (2007) argue that the ability or inability of societies to establish infrastructure and institutions to manage water resources distinguishes states as being industrialized or

underdeveloped. For Grey and Sadoff, water infrastructure and institutions represents a fundamental foundation for water security and a driver of development. Most definitions of water security focus on ensuring adequate quantities of water, in the quality necessary, to meet all current and future needs, in a manner that protects and enhances the ecosystems which support the planet (Global Water Partnership, www.gwp.org; Gleick 1998; Postel, 2000). Grey and Sadoff expand upon the definition to address the potential destructive nature inherent in water, asserting that water security also encompasses enjoying "an acceptable level of water-related risks to people, environments and economies" (2007: 547-548). Given that societies have limited ability to stipulate the types or intensity of water-related risks that they might endure, Grey and Sadoff's definition implies that water security encompasses the availability of resources and the capacity to manage resources and adapt to risk and catastrophe.

Water-related risks are largely determined by a society's hydrologic environment, which either advantages or disadvantages societies in their development potential (Grey and Sadoff, 2007). Societies with easy hydrologic legacies benefit from predictable and consistent rainfall as well as reliable and easily accessible river flows. Such societies require minimal infrastructure and water management systems to ensure water security (Grey and Sadoff, 2007). These societies have been able to make early investments in developing systems that maximize the utility of their water resources to propel economic and societal development. In contrast, societies with difficult hydrologic legacies face extreme variation in availability of water resources and unpredictable rainfall (Grey and Sadoff, 2007); such societies may be in low-land coastal areas prone to flooding, or arid

and semi-arid climates where rainfall is sporadic. For societies with difficult hydrologic legacies, the need for water infrastructure is huge (Grey and Sadoff, 2007). However, these societies tend to have lower capacity to invest in water infrastructure and management systems, thus remaining vulnerable to their hydrologic environment. Grey and Sadoff (2007) assert that societies that have been disadvantaged with difficult hydrologic environments have been caught in a hydrology-poverty trap in which the inability to establish water infrastructure constricts the ability to establish a secure basis for economic development.

For example, the lack of sufficient water infrastructure in Ethiopia makes the country significantly water insecure, despite possessing one of the major tributaries of the Nile. Ethiopia's hydrologic environment is highly variable and often extreme, with the possibility of droughts occurring every five years (Grey and Sadoff, 2007). The inability to prevent or quickly rebound from such extreme water-related disasters has resulted in an estimated 38% loss to Ethiopia's GDP (WWDR-3, 2009). Other countries, like Kenya and Mozambique, have similarly experienced significant economic losses as a result of insufficient infrastructure and management systems to handle extreme hydrologic events (WWDR-3, 2009). Such examples exemplify the connection between a country's level of water security and its ability to manage the economic, social and environmental implications of water shortages. Until a country is able to establish what Grey and Sadoff (2007: 561) call a "minimum platform" of water infrastructure and institutional capacity to secure their current water needs and minimize the effect of extreme water events, the country will not be water secure.

For decades, countries have invested heavily to develop water infrastructure for storage and distribution, in order to ensure adequate supplies of water to support growth in the agricultural sector and overall economic development. Such investment has often been pushed by the World Bank and other international donors as part of countries' poverty reduction strategies. Sandra Postel (1996) reports that the development of large scale dams has been exponentially high, reaching over 40,000 in 1996. The development of reservoirs, irrigation systems, barrages and other water projects has allowed countries to increase their agricultural productivity, and has provided additional means of energy generation (WWDR-3, 2009). While major water projects have provided many positive benefits for economic development, the construction of dams is also highly disruptive to the local communities and to the ecological system (Postel, 1996; 2000). Water projects change the nature of the river flows and qualities, impacting entire ecosystems which rely upon it (Postel, 2000). Moreover, large water projects require the relocation of entire communities, or create negative consequences due to loss of livelihood or food sources. Therefore, establishing water infrastructure to ensure state water security can threaten human security.

The Security-Development Nexus

The idea that water security provides a foundation for development is based on the theory of the security-development nexus. This concept presumes that security and development are mutually reinforcing, in that security will be continually threatened in the absence of development, and development will be hindered in the absence of security.

The theory of the security-development nexus has been evolving steadily since the concept of human security was introduced by the UNDP's 1994 Human Development Report. Responding to the increased incidence of civil wars and violent conflict within states at the end of the Cold War, the Report outlined the need for new paradigms for security and for development that were human-centered rather than being state-centric. Moreover, the rise in civil violence and instability made salient the incompatibility of economic development, political instability and violence (Collier, 2007; Stewart, 2004).

Introducing the concept of human security, the authors of the 1994 Human Development Report sought to remind the international community that the United Nations was established with a broad understanding of security. The idealist vision set out by the international community established that international peace and security depends on peaceful and cooperative relations between states, the recognition of fundamental human rights and human dignity, and a concerted effort to "promote social progress and better standards of life in larger freedom"(United Nations, 1947). Rather than focusing on traditional security threats such as external incursions on territory, the concept of human security emphasizes the promotion of the individual and her protection against "the constant threats of hunger, disease, crime and repression" (Human Development Report, 1994:3).

The concept of human security encompasses a broad range of security concerns that directly impact the well-being of individuals. An obvious human security concern is personal security from state-initiated violence and repression, from ethnic-based violence, from criminal activity, and from domestic abuse (Human Development Report,

1994: 30). However, the concept of human security also incorporates economic or livelihood security, health security, food security, and environmental security (Commission on Human Security Report, 2003; Human Development Report, 1994). This expansive operational definition of security emphasizes that human well-being depends upon multiple interdependent factors. Economic insecurity, in the form of unemployment or insufficient income, compromises the individual's food security or health security. Moreover, environmental insecurity, such as water scarcity or excessive air pollution, undermines public health, food security, and livelihoods. By defining security in terms of human dignity (HDR, 1994), freedoms and opportunity (Barnett et al., 2010), and equity and justice (HDR, 1994; Commission on Human Security, 2003; Nsaih-Gyabaah, 2010), the concept of human security requires a development paradigm that advances human potential and improves the quality of life of the most vulnerable.

The traditional development paradigm primarily concerns national economic growth, and delineates a specific trajectory by which countries progress from impoverishment to affluence (McMichaels, 2008 ;Nsiah-Gyabaah, 2010). In this framework, the ultimate objective of development remains on improving standards of living (McMichaels, 2008), however, such progress is viewed as an automatic outcome of economic growth. Moreover, given its Euro-American heritage, traditional conceptions of development focus on competitiveness in the global market, industrialization, and utilizing resources to maximize profits (McMichaels, 2008; Thomas, 2001). The traditional development paradigm has been criticized for being narrow (Stewart, 2004), ethnocentric (McMichaels, 2008; Nsiah-Gyabaah, 2010), exploitative (Thomas, 2001),

and increasing the inequalities between the rich and poor (Nsiah-Gyabaah, 2010), thereby undermining human security rather than promoting it.

The human-centered development presented by the 1994 Human Development Report supports human security because it prioritizes human well-being and quality of life. Embodied in the Millennium Development Goals (2000), human development concentrates on eliminating poverty and hunger, improving human health and life opportunities, and expanding human freedoms (HDR, 1994; Barnett, Matthews, and O'Brien, 2010). The new paradigm offered by the Human Development Report also emphasizes that development should be sustainable, so that the opportunities for future generations are not limited and the natural systems that sustain the planet are maintained (HDR, 1994). Sharing objectives and foci, human security and sustainable human development are mutually reinforcing; stunted human development undermines an individual's security, while human insecurity can likewise hamper the individual from fully exercising her right to develop. As Frances Stewart notes, "if we take a more utilitarian approach to the definition of development – that it furthers human happiness – insecurity has severe adverse affects" (2004: 4)

The interconnections between human security and human development extend to support state security and overall development. Obvious connections have been established between the level of human development and level of economic development. The Human Development Reports assess countries on a number of variables measuring different aspects of human development, such as educational attainment, poverty rate, political freedom, gender equality, and quality of health. The Reports demonstrate that

countries with higher levels of human development also report higher GDP/capita than countries with low human development. The link between human security, state security and development is further demonstrated through the work of economist Paul Collier and his colleagues (2004, 2007), who have researched the impacts of civil war on economies, as well as through the work of Homer-Dixon (1999) who explored the processes by which resource scarcities induce intergroup violence. In addition, political and social unrest can occur when enough people experience threats to their economic security and overall well-being that they perceive result from the inability of the state to fulfill its social contract (Stewart, 2004).

Water security clearly bridges state security concerns and human security concerns, and interconnects security with economic and human development. At the state level, securing sufficient water resources is critical to ensuring food production and supporting industry, thereby ensuring the economic viability of the state. Water insecurity jeopardizes economies that are primarily reliant on their agricultural sector, though countries that utilize hydropower energy sources are also more vulnerable to water shocks than countries that rely on other energy sources (Gleick, 1993). As noted by Grey and Sadoff (2004) and others (Clarke, 1994; Hunt, 2004), the development of water resource management systems forms a critical basis for economic development of states and supports the formation of other sectors.

Yet, importantly, water represents the fundamental basis for human development and therefore water security exemplifies human security. Water security at the human level is defined as having access to improved water sources, such as having a household

connection, or having access to a public standpipe, a protected well or spring within one km walking distance from their residence (Palaniappan, 2009). It is assumed that access to improved water sources enables an individual to obtain the minimum basic water needs (20-50 liters) for personal consumption and domestic use (Gleick, 1996; Watkins, 2006). However, nearly one billion people, primarily in developing countries, have limited access to clean drinking water, and 2.6 billion lack basic sanitation (Palaniappan, 2009; Watkins, 2006) , which means they use contaminated waters for bathing, laundering their clothes, and other domestic uses. Moreover, "improved water sources" does not guarantee that the water is safe for human consumption (Palaniappan, 2009). Lack of clean water causes water-related diseases, which are a primary cause of death for millions of adults and children in developing countries (Gleick, 1996; Hunt, 2004; Palaniappan, 2009; Watkins, 2006; WWDR, 2009). Palaniappan (2009) explicates the negative impacts of water insecurity on children, expressing that lack of clean water impedes cognitive and physical development, resulting in wasting and stunting. In addition, water insecurity negatively impacts livelihoods and food security, and exaggerates gender inequalities. In many rural areas, women and children have to walk miles each day to collect water, often from contaminated sources (Watkins, 2006). Such labor detracts from other productive activities and educational attainment (Watkins, 2006), thereby impeding the full economic potential of a given country.

The human security paradigm recognizes that human impoverishment and insecurity are outcomes of structural inequalities (HDR, 1994; Watkins, 2006). In the case of water, structural inequalities play an influential role in creating human-level water

insecurity. An individual's financial resources and power determines water access and water use, even in times of water shortages (Watkins, 2006). Most individuals living in wealthy countries, along with the urban middle and upper classes in developing countries, have unlimited access to water within their homes. According to the World Water Development Report, approximately half of the world's population had piped connection to water within their homes or on their property in 2006 (WWDR-3, 2009). Such ease of access permits excessive use, particularly when water is not priced at its full value.[1] In contrast, the process of having to walk far distances or wait in long lines at public wells, the daily routine for millions of people, automatically limits the amount of water one can feasibly use. In addition, the poor must pay exorbitant amounts for bottled water, or use polluted sources. Political and institutional structures often discriminate against the poor, frustrating their ability to secure their basic water needs. Public utilities in many developing countries "are failing the poor" because of restrictive policies on qualification, inefficient and unaccountable management, and inequitable pricing (Watkins, 2006:10).

The implications for water insecurity at the human level are significant for the economic and societal viability of states. As intimated, water insecurity significantly hampers human health and well-being, which translates to large costs for public health. Water insecurity also creates losses to overall economic productivity due to disease, poor nutrition, and women's hours spent collecting water. In addition to the economic

[1] Pricing of water is a huge area of debate among policy makers and academics concerned with sustainable water use. Proponents of water as a basic human right fear that the economic valuation of water will result in intensified disparities between water haves and have-nots. Proponents of water as an economic good proffer that placing economic value to water will promote water conservation. To address the potential for water marginalization, some proponents of water as a commodity recommend some subsidies for the poor.

impacts, the insecurities caused by a lack of freshwater can trigger intergroup animosities that result in violent conflict at the local level (Wolf, 1999), as well as dissatisfaction and resentment toward the state. The Millennium Development Goals have attempted to persuade the community of sovereign states that investments in human development, such as ensuring human water security, promotes overall stability and growth.

The Determinants of Water Insecurity

Up to this point, we have discussed the concept of water security, and presented the interrelationship between water security and economic and human development. The goal of this section is to describe several factors that can lead to water insecurity. One of the greatest challenges to ensuring water security is the looming threat of water scarcity. Water scarcity denotes the physical and economic gap between the actual water availability and the amount of water needed at a per capita rate. The potential for water shortages presents a serious threat to human health and well-being, as well as a critical challenge to the economic viability of states and their capacity to cope with such environmental stress. Water scarcity can be induced by natural factors, such as arid climates, but most often, water scarcity results from excessive exploitation of water resources by human societies (Gleick et al. 2002; Postel, 2000). Human consumption patterns have expanded rapidly in the past hundred years, and much of the development has depended on the availability of water for agricultural production, energy production and other uses. Substantial evidence suggests that we are reaching a crisis point in regards to water, as Sandra Postel notes, "over the past quarter century, global per capita water supplies have declined by one-third and 1.7 billion people in developing regions

are currently experiencing water stress… If current trends persist, as many as 5 billion people could face such situations by 2025" (Postel, 2000:8).

In his classic book *Environmental Scarcity and Violence*, Thomas Homer-Dixon (1999) proposes that natural resource scarcity derives from three major forms of imbalances: when supply is diminished or degraded, when demand overwhelms supply, and when structural forces of society result in uneven distribution of the resource (48). These three sources of scarcity often interact to intensify the experience of resource loss. The three sources of scarcity represent different theoretical perspectives about the primary cause. Supply-induced scarcity corresponds to an ecological/natural science perspective that focuses on the hydrological environment and the effects of climate change. Demand-induced scarcity reflects neo-Malthusian assumptions that population growth will place undue strain on the capacity of the environment and society to manage need. Finally, the view that scarcity results from imbalances in the structure of society characterizes a neo-Marxist theories on political economy.

Supply-induced scarcity relates to the disparity between the actual quantity of water available within a region and the rate at which these resources are depleted (Cooley, 2009). Supply induced scarcity can occur as a result of droughts, overdrawing of underground aquifers, restricted flow from an international river, or from excess pollutants that make available water unusable. Environmentalists predict that climate change will engender major supply-induced water scarcities, which will also likely increase water demands (Cooley, 2009; Jackson, et al., 2001). Since the late 1980's, scientists have been investigated in potential effects of human activity on the earth's

atmosphere and ecosystems. Although the topic is much debated, the Intergovernmental Panel on Climate Change (IPCC) has annually disseminated findings that suggest that the impact on the atmosphere is huge, and will result in major changes in the world's climates (Cooley, 2009). The warming of the climate systems, and the subsequent warming of the ocean temperatures, are producing and will continue to produce significant changes in the world's hydrologic environments. The projected changes include increases in precipitation in regions above 30° latitude, decrease in precipitation in arid and semi-arid regions, changes in the timing and amount of surface water run-offs, increased likelihood of extreme weather and water-related disasters, and so on (Cooley, 2009; Grey and Sadoff, 2007; Mitchell, 2007). Extreme water-related disasters pose a significant security concern because they occur unexpectedly, and require significant resources to ameliorate the consequences. Cooley (2009) has stated that the frequency and intensity of floods and droughts are expected to escalate at exponential rates, indicating that an event that might have occurred once every 100 years may occur once every 10 years.

In addition to increasing water insecurity due to floods and droughts, climate change will likely affect both the supply of water resources available at local, national and regional levels, as well as increasing demand. Jackson and his colleagues (2001) provide a rich discussion on the ways in which climate change will impact water availability. First, the distribution of water over time and place will likely be a major outcome of climate change, which could potentially instigate other changes to the hydrologic cycle. Seasonal rainfall may shift, as will run-offs from glaciers and ice-caps,

which feed most of the world's rivers. While some areas will become wetter, other regions will become drier, which will induce greater rates of evaporation and will require more water resources for agricultural production (Jackson et al. 2001). These researchers also highlight the impact that changing hydrologies will have on ecosystems which further effect human societies. For example, they note that changes in local water habitats might result in the overproduction of certain algae or the loss of certain aquatic species, thereby creating imbalances in the larger environment or threatening food sources (Jackson et al. 2001). The effects of climate change on the availability and productivity of water will also aggravate the challenges many water-short countries already face in regards to meeting their food production needs. Therefore, while climate-change primarily causes supply-induced scarcity, it simultaneously creates societal environments in which demand for water increases.

Demand-induced scarcity results from increases in water withdrawals as a result of growing population and escalating consumption patterns. Anxiety over water shortages focuses largely on the anticipated strains placed on finite water resources caused by rapid population growth (Gleick, 1993, 2009; Hunt, 2004; Postel, 2000; Watkins, 2006; WWDR-3, 2009). Projections of global population growth imply exponential increases, estimating that we will reach over nine billion by the year 2050 (Global Water Partnership, www.gwp.org; Postel; WWDR-3, 2009). Postel(2000) notes that to meet the basic food needs of the global population in 2025, "an additional 500 cubic kilometers of irrigation water" will be needed (2000: 942). Homer-Dixon (1999) explains demand-induced scarcity that derives from rapid population growth also

stimulates supply induced scarcity, because as more water is being demanded for use, water is simultaneously being diminished in total amount or degraded by human and industrial pollutants.

Population growth, therefore, impacts the 'water resource pie' in two ways: it "forces the pie to be divided into smaller slices" and it reduces total size of the pie from overexploitation and misuse (Postel, 1996:35). Estimates of the impact of population growth on the availability of water resources are dire. Postel (2000) asserts that the number of people living in water-stressed countries will increase 600% by 2025. Such concerns evoke Malthusian predictions that unfettered population growth would result in catastrophic resource shortages, placing undue strain on societies (Kahl, 2006). Though traditional Malthusian theory has been discounted (Homer-Dixon, 1999; Kahl, 2006), neo-Malthusians still provide valuable discussion points regarding the connection between population growth and water scarcity. Kahl explains that neo-Malthusians recognize that the ill-effects of population growth are mediated by consumption habits and by technological innovation (2006:6). While the potential for resource scarcity looms, multiple generations have demonstrated approaches to stave off catastrophe, such as the Green Revolution or various irrigation improvements. The major contribution of the neo-Malthusians derives from their theories linking resource scarcity and conflict, which will be discussed in greater detail below.

In addition to population growth, other demographic factors place strains on a country's water resources, particularly the rise in urban migration. Some projections propose that the urban population will represent over 60% of global population in 2025

(Postel, 2000). Rapid urbanization places significant strain on cities and states because it often occurs without sufficient planning (Kahl, 2006). Urban migration increases the demands of urban dwellers, which often means that water designated for agricultural use is redistributed for cities (Postel, 2000). While urbanization often infers economic growth, millions of people living in urban areas reside in urban slums, which have limited access to piped water and clean sanitation facilities (Watkins, 2006; WWDR-3, 2009).

In addition, the rising middle-class in the world's cities signifies expanding consumption habits, such as a higher-protein diet, which place a greater demand on water. Several countries, particularly China and India, possess the world's largest populations and greatest urban migration, and are also predicted to face severe water shortages in the coming decades (WWDR-3, 2009). Current water shortages threaten China's food production capacity and their industrial development. According to some estimates, the deep aquifer under the North China Plain has been declining at a rate of 10 feet a year, and wells near Beijing burrow over a half a mile to access fresh water (Mitchell, 2007). Other estimates imply that groundwater pumping in Beijing extracts thirty billion cubic meters of water a year (Barlow, 2007). Although much of this water is designated for food production, Barlow notes that large amounts of water are diverted to "fuel China's economic 'miracle'" (2007: 14). China and other countries are tackling their water constraints through food importation, also known as investing in "virtual water" (Barlow, 2007).

Supply and demand induced water scarcity do not affect all individuals equally. Rather, structural disparities within societies often determine the extent to which

individuals experience water scarcity. Structural disparities refer to imbalances within a society in terms of the distribution of political power and wealth that determine access to political goods. The 2006 Human Development Report, titled *Beyond Scarcity: Power, poverty and the global water crisis*, establishes that water scarcity is primarily a manifestation of inequalities between the rich and the poor. The report notes:

> "The problem is that some people – notably the poor – are systematically excluded from access [to water] by their poverty, by their limited legal rights or by public policies that limit access to the infrastructures that provide water for life and for livelihoods. In short, scarcity is manufactured through political processes and institutions that disadvantage the poor." (Human Development Report, 2006:3)

This statement represents the essence of Homer-Dixon's structural scarcity, by which favored groups access disproportionately larger quantities of the resource, while disadvantaged groups receive insufficient quantities to support health and well-being (1999:15). Drawing on Marxist and neo-Marxist theories of political economy, structural scarcity underscores the political, institutional and economic processes within societies that limit the accessibility of resources for segments of the population (Homer-Dixon, 1999; Kahl, 2006). Such processes may include restrictive property laws which exclude informal urban settlements from connecting to public utilities (Watkins, 2006:52), or parochial politics that allows certain groups greater access to water sources than others. While most structural scarcity occurs at the local/within-country level, it can also be present between states or state-like entities, for example the disparities in water access between Israel and Palestinian territories.

Because of the variety of causes and the negative consequences of water scarcity on human health and societies, scholars have formulated various approaches for measuring water scarcity and identifying the vulnerabilities for scarcity. Some approaches focus on the amount of water available per capita, while others concentrate on water withdrawals relative to known supply, and still others also account for the presence and adaptability of water infrastructure and institutions. Malin Falkenmark was among the first to propose a water scarcity index, in which a country's total available water resources were divided by the population. Falkenmark and her group established the benchmark of 1700 cubic meters/capita/year of water as the level of water necessary for developed countries to maintain their standard of living and experience minimal water shortages (Gleick et al. 2002). This benchmark level includes the amount of water individuals need for their daily requirements, as well as the amount of water represented in an individual's daily food intake, productive activity and other uses. When water availability per capita drops below that benchmark, what Falkenmark termed as a "water barrier", countries begin to experience negative outcomes on human and economic development (Gleick, 1993). Falkenmark identified countries with less than 500 cubic meters/capita/year as experiencing absolute water scarcity (Gleick et al. 2002).

Water scarcity is also often measured in terms of the amount of water withdrawn from renewable sources. In many regions, humans already expropriate available water supply at a faster rate than natural recharge (Mitchell, 2007; Palaniappan & Gleick, 2009; Postel, 1996, 2000). Some researchers assert that water shortages are experienced when countries withdraw at least 20% of their total water supply (Clarke 1993; Gleick 1993).

The Food and Agriculture Organization provides a more extreme estimate, explaining that physical water scarcity occurs when countries withdraw over 70% of their annual freshwater sources for domestic, agricultural and industrial purposes (FAO.org). Both Peter Gleick (1990) and the International Water Management Institute (1997) have included water withdrawals in their respective indexes measuring vulnerabilities to water challenges. In his Vulnerabilities to Water Systems Index, Gleick included two ratios that relate to water withdrawals: level of consumption compared to water availability, and level of groundwater overdraft compared to usual groundwater withdrawals (Gleick et al., 2002). The International Water Management Institute assessed both the anticipated increases in water withdrawals between 1990-2025, and the extent to which projected water withdrawals in 2025 nears its actual water limit (Gleick et al. 2002).

Finally, there have been some indicators of water stress and water scarcity that also account for the adaptive capacity of the country, which includes the presence of water infrastructure and institutions. Gleick's Vulnerabilities to Water Systems Index includes an indicator that focuses on the availability of storage facilities relative to annual water supply. Gleick asserts that countries with limited storage capacity are more vulnerable to droughts or floods than countries with adequate storage facilities (Gleick et al., 2002). Ohlsson et al. (1999) developed the Social Water Stress Index, which comprises the socio-economic environment of a given society along with general institutional capacity, and the existence of water legislation and water resource management (Gleick et al., 2002). The Stockholm Environment Institute incorporates coping capacity in their Water Resources Vulnerability Index (Gleick et al., 2002), which

incorporates an assessment of the institutional capacity, political will, quality and availability of infrastructure, social imbalances in distribution of wealth and power, and availability and quality of the natural resource (Stockholm Environment Institute, sei-international.org).

Water Security and Interstate Conflict

The concern with water scarcity extends beyond the limitations that water shortages will place on economic development and human well-being. As the specter of water scarcities amplifies, scholars and policy makers have sounded the alarm regarding the potential for violent conflicts over water (Barlow, 2008; Homer-Dixon, 1999; Kahl, 2006; Klare, 2002; Kramer, 2004). The concern is so great that past vice-president of the World Bank, Ismail Serageldin, and others have asserted that water will be the resource over which countries will fight in the next century (Barlow, 2008; Klare, 2002; Serageldin, 2009). Significant research suggests that disputes over international waters have more often prompted cooperation between states than violent conflict (Wolf, 1994). However, the uncertain future cannot rely on trends of the past. It is expected that intensifying water scarcity will heighten perceptions of insecurity for individuals and states, and increase competition for the resource, which could lead to conflict (Kramer, 2004). In addition, while states may be more inclined to find diplomatic solutions to sharing water resources, conflict at the local or intrastate level pose a threat to national and regional security, as these local conflicts could escalate in scale (Kramer, 2004; Postel, 2000; Wolf, 1994). In discussing the link between water security and conflict,

this section will cover the factors that contribute to conflict and to cooperation between riparian states, international law regarding shared watercourses, and the types of violence that occurs at the subnational level because of water insecurity.

At both the interstate level and the intrastate level, structures of power determine the evolution and outcomes of water-related conflicts. Alex Evans (2010) asserts that how states or groups react to environmental scarcity is largely mediated by the political economy context of the country or region. Describing work by Ruckstuhl (2009) on sustainable development in conflict sensitive areas, Evans provides four aspects of the structural context that influence access to resources. These include ownership, consumption, distribution and governance (Evans, 2010), each of which incorporates issues of equity, control, and political voice. At the international level, the structural context relates to the relative power position of riparian states, while at the subnational level, the structural context determines the explicit and implicit hierarchies established between groups that affects societal, political and economic marginalization. In regards to access and control of natural renewable resources such as water, the structural imbalances of the subnational political economy can lead to what Homer-Dixon (1999) termed "ecological marginalization," which occurs when economically and political disenfranchised groups are forced to move to environmentally precarious areas. This idea of structural imbalances is important in the following discussion regarding water-related conflicts at the interstate and intrastate levels.

At the international level, water conflicts represent a category of hydropolitics, which entail the interactions and policy decisions of states regarding shared water

sources. Considering that there are over 260 international river basins, the opportunity for contentious interstate relations over water is high (Barlow, 2008; Kramer, 2004). Though states traditionally claim all contents of their territory as part of their sovereign domain, the natural movement of water disregards territorial bounds (Dinar, 2002). The mobile and solvable nature of water implies that the use of water sources in one state will likely affect the quality or quantity of the resource for other basin states. In addition, for regions where the availability of water resources is limited, the attempt by one state to establish water security, such as developing a dam for water storage, may be perceived by other riparian states as threatening their water security.

Significant research has been carried out to explore the extent to which water has been both a factor in violent conflict between states as well as a vehicle for negotiation and cooperation. Peter Gleick and Aaron Wolf represent the most prominent, though often opposing, perspectives on the politics of water. Gleick and his colleagues at the Pacific Institute have documented that while water has not been the declared objective of war between states in over 4000 years (Gleick, 1993; Wolf, 1999), water has been an implicit factor in disputes between riparian states that have occasionally resulted in military engagement between states (see Water and Conflict Chronology, 1998 onward). For example, access to or protection of water sources has been an underlying objective of conflict, such as in the territorial disputes between Israel, Jordan, Palestine and Syria (Dinar, 2002; Gleick, 1993; Klare, 2002), and in the ongoing tensions between Turkey, Syria and Iraq over Turkey's control of the headwaters of the Tigris and Euphrates Rivers (Klare, 2002). In addition, water has been employed either as a target of conflict or as an

instrument of war (Gleick, 1993). Hydroelectric dams, irrigation water systems, and other water infrastructure were bombed in many of the recent wars, including World War II, the Korean War, the Vietnam War, and the first Iraq war (Gleick, 1993). Destruction of water infrastructure causes massive harm to a country, potentially inducing flooding, causing blackouts, and compromising the quality of the water for human consumption, thereby acting as an effective means for weakening opposing forces. These examples confirm the assertion that water has been an integral feature in interstate conflict, even if states have not directly gone to war over water.

Aaron Wolf and his colleagues have argued extensively that not all water-related conflict between states leads to violence. Wolf asserts that water issues are more likely to promote cooperation between states than being a divisive factor that will lead to violent conflict (Delli Priscoli and Wolf, 2009; Wolf, 1999). Through their research at the Water Conflict Management and Transformation program at University of Oregon, Wolf and his colleagues have found that countries typically avoid potentially violent conflict over water and instead choose more diplomatic approaches, because "war over water seems neither strategically rational, hydrographically effective, nor economically viable" (1999: 29). Instead, negotiation and the establishment of international treaties regarding shared water sources are the most common outcome of water disputes (see Transboundary Freshwater Dispute Database). Reviewing the outcomes of over 1700 interstate water-related disputes over the past 150 years, the ratio of violent conflicts to agreements weighs heavily in favor of cooperation, at 507 to1228 (Delli Priscoli and Wolf, 2009). Contradicting the analysis that Gleick has provided regarding the use of water as a factor

in international conflict, Wolf argues that in the past 50 years, there are only 37 cases of acute military encounters involving water, and of these, 32 were between countries in the Middle East (Delli Priscoli and Wolf, 2009). Wolf uses this evidence to support his assertion that conflict over water is strategically irrational and economically unviable. Instead, water basin states seem willing to engage in the lengthy process of negotiation to ensure recognition and protection of water use.

Whether water acts as a contributing factor of conflict between states or whether it serves as a vehicle for cooperation depends on a number of environmental and political conditions. First, water has to be perceived as having strategic value that adds to the economic and political power of the state, and therefore is worth defending or acquiring (Gleick, 1993; Klare, 2002). Stated more urgently, water has to become an "issue of national survival" (Klare, 2002: 141). Wolf proffers that the "national water ethos", which includes the role of water in the historical national identity, the dominance of the agricultural sector in the economy, and the emphasis on water security in political rhetoric, will influence the extent to which water is viewed as national security issue (Delli Priscoli and Wolf, 2009:18). Once water is determined to be a critical national asset, the degree of water scarcity experienced by the respective states represents a dominant condition contributing to the possibility of conflict (Dinar, 2002; Gleick, 1993; 1999; Homer-Dixon, 1999), as it magnifies the value of the resource. As discussed previously, the intensity of water scarcity is influenced by a number of factors, including the rate of water withdrawals relative to the rate of natural recharge and known absolute availability of water, the size of the demand given the actual supply, the quality of the

resource, and structural features that dictate how water is distributed across the population. A condition related to the degree of scarcity is the adaptive capacity of basin states, both individually and on a regional level. As noted by Delli Priscoli and Wolf, "the likelihood of conflict rises as the rate of change within the basin exceeds the institutional capacity to absorb that change" (Delli Priscoli and Wolf, 2009:19).

Another condition that factors into the hydropolitics of a water basin is the extent to which a water source is shared by states (Dinar, 2002; Gleick, 1993; 1999). When the number of claimants to a shared water source increases, it becomes more difficult to satisfy all stated concerns and needs, such as in the Nile River Basin, which involves ten riparian states. The availability of alternative water sources will also be influential in the hydropolitics of a region (Dinar, 2002; Gleick, 1993; 1999; Homer-Dixon, 1999). When states are primarily dependent on a single water source, the appropriation of water by another user will likely be perceived as a threat to national water security. In such cases, a state may be willing to endure the "economic, social and political cost" of conflict for the sake of protecting their access to water (Gleick, 1999: 108). Relative level of development among the basin states also aggravates water relations, because water factors so highly in economic development, and because perceptions of relative deprivation exacerbate tension (Delli Priscoli and Wolf, 2009). A history of animosities between basin states may also influence the occurrence of water-related conflict (Dinar, 2002; Homer-Dixon, 1999) in that water disputes could provoke other areas of distrust and contention that incite violent conflict.

As with any interstate conflict, power relations between states sharing a water basin largely determines the hydropolitics of a region (Dinar, 2002; Gleick, 1993; 1999). As indicated by Ruckstuhl, relative power dynamics is influenced by the political economy of the region and determines how control over resources is established. Most often, regional powers dominate the decisions regarding how water is allocated (Gleick, 1999), and power imbalances in regards to water access can heighten the security dilemma between basin states (Dinar, 2002). A critical factor in the relative power dynamics of basin states is states' physical position in relation to the water source. While power politics alone can create complex interactions for neighboring states, riparian position complicates the strategic options even more. Regardless of their relative power position, upstream states often have significant advantage over downstream states, because they can control the amount and timing of river flows. Downstream states, as noted by Homer-Dixon, "often fear that their upstream neighbors will use water as a means of leverage" (Homer-Dixon, 1999:139). Additionally, when the upstream riparian state is also the dominant power, the likelihood that the concerns of the downstream states will be recognized is low. While the downstream riparian may wish to establish greater access or control over the water source, inciting conflict over water would only be strategically rational if the downstream state is also the regional power (Homer-Dixon, 1999; Wolf, 1999), because it would require some position of advantage over the upstream state to attain objectives. However, even in such a scenario, the judiciousness of initiating confrontation over water is unclear, because the destruction to upstream

dams or other attacks on water infrastructure upsets the flow and quality of the water source, creating negative downstream effects.

The Nile River Basin provides an insightful example for how relative power and riparian position interact to determine the hydropolitics of a region. Egypt has been the dominant power in the Middle East/North Africa region since the middle 1950's, possessing the largest army, and espousing to be the leader of the Arab world (Little, 2008). However, Egypt is also the downstream riparian state, and thus highly dependent on the actions taken by its upstream neighbors, Sudan and Ethiopia. Egypt has used its power to dominate negotiations with Sudan regarding allocation and flows, such that Egypt can claim 55.5 billion cubic meters of the Nile's annual flow rate, while Sudan is allotted approximately 18.5 billion cubic meters (Klare, 2002). While a treaty between Egypt and Sudan has been in place for the past 50 years, tensions between the Nile Basin countries persist because of perceived threats to water resources (Klare, 2002). Egypt remains highly sensitive to the development projects proposed and initiated by upstream countries, viewing such actions as threats to their national security (Dinar, 2002). This is particularly true for those countries with which Egypt has no formal water agreement, such as Ethiopia. Similarly, the upstream states perceive Egypt's ability to dominate negotiations as impingements on their sovereignty and security (Dinar, 2002). Tensions between the countries of this region are expected to grow as demand for food production and economic development increase (Barlow, 2008; Klare, 2002). The hydropolitics of the Nile River Basin exemplifies the point that interactions between states in regards to water use and water access are influenced by numerous factors, including the relative

power of riparian states, the urgency of the water issue, the number of states claiming rights to the resource, and the level of dependency each state has on the shared water source. Perception of an unfair distribution of a shrinking water pie is likely to be most influential in whether or not there is conflict between states.

International Frameworks for Promoting Cooperative Water Sharing

Wolf (1999) argues that institutional and legal frameworks at the regional and international levels represent a key resilience factor that contributes to cooperative outcomes in hydropolitics. The Transboundary Freshwater Dispute Database details hundreds of water-related treaties, negotiation proceedings and cooperative agreements among riparian states over issues of timing, quantity and quality of water flows, and development projects. Wolf and others assert that the existence of bilateral or multilateral agreements over shared water sources bolster the "hydropolitical resilience" of the region, as these agreements have withstood other controversies and incursions between parties (Dinar, 2002; Wolf, 1999).

Water law, particularly at the international level, is still a developing area. Many of the processes and agreements that have been put into place between riparian states have occurred in the absence of overarching international water laws and governance (Wolf, 1999). While the international community has developed a handful of international declarations and guiding principles to instruct states on the equitable and sustainable use of international waters, the scope of international laws and institutions to oversee water relations between states is limited (Serageldin, 2009), leaving negotiation

over shared water resources largely up to the riparian states (Wolf, 1999). Additionally, the capacity of the existing institutional framework to address increasingly complex problems has been questioned by some scholars (Gleick, 1993; Wolf, 1999). Even at the regional level, the presence of functional and neutral water institutions is lacking, as only 40% of the world's 263 international water basins possess some form of cooperative management agreement, most of which are between only two riparian states (Evans, 2010). In addition, present power dynamics between riparian states often dictates the terms and outcomes of the negotiation process (Evans, 2010), which likely heightens underlying tensions and uncertainty between states.

The most notable international law regarding water use is the Convention on the Law of the Non-Navigational Uses of International Watercourses, which was adopted by the UN General Assembly in May 1997. This convention reaffirms and codifies the principles outlined in the Madrid Declaration (1991) and the Helsinki Rules (1966), which promoted equitable use and minimal harm, and adds to these processes for addressing disputes between users and the importance of transparency of information. While the Convention provides a foundation for strong international law regarding water use and conflict resolution, it has been weakened by the slow process of ratification (Wolf, 2002), and by its vague and sometime contradictory language (Wolf, 1999). Moreover, there is no intergovernmental organization adequately equipped to ensure adherence to the rules of engagement.

Intrastate Water Conflicts

While interstate wars over water issues are rare, water has been a cause of violence at the subnational level (Evans, 2010; Gleick, 1993; Homer-Dixon, 1999; Wolf, 1999), which refers to any form of violent interaction between individuals, groups and state actors within a recognized sovereign nation. Disputes over inequitable distribution or access to water (Kramer, 2004), poor water quality (Kramer, 2004; Wolf, 1999), or forced displacement due to major water projects (Gleick, 2006) have all led to violent intergroup tensions as well as civil unrest against the state. As with interstate conflict, water has been used as a weapon during civil wars, as well as a political tool, as in the case of political terrorism. In addition, the consequences of water insecurity, for example the loss of livelihood or rising food prices, have also been identified as indirectly causing conflict at the local level (Homer-Dixon, 1999; Kramer, 2004).

Of the 114 water conflicts described in the Water Conflict Chronology as occurring between the end of WWII and 2006 (Gleick, 2006), nearly one third of these conflicts transpired at the subnational level. In determining whether conflicts took place at the subnational level, I set criteria to include accounts of inter-group violence, civil unrest against the state, use of water as a weapon or target in civil war, and use of water as political tool as in the case of terrorism. I determined "inter-group conflict" to refer to conflict between tribal, ethnic or religious groups, competing sectors of the economy, social classes, peoples from different provinces or federal states. In identifying subnational conflicts involving water, I did not include cases in which water resources were impacted as part of war occurring within one country (such as the targeting of water

infrastructure in NATO's intervention in Yugoslavia, or damage done to facilities in US invasion of Iraq), or when external actors negatively impacted the quality or availability of a state's or entities water resources (such as the US's decision to halt water development projects in Gaza as punishment to Palestinian Authority's failure to respond to rising terrorism). Interestingly, the frequency of intrastate violence involving water appears to increase after the end of the Cold War.

In analyzing the causes of inter-group conflict or of civil unrest against the state, structural inequalities and relative deprivation represent two major underlying factors. At the local level, determinations of ownership, consumption, distribution and governance (Evans, 2010) can be highly influential in provoking tensions between groups, as these structural inequalities often precipitate the experience of resource scarcity (Homer-Dixon, 1999). Relative deprivation refers to a subjective experience in which an individual or group perceives a disparity between their current state of quality of life and their desired state of quality of life (Homer-Dixon, 1999). Homer-Dixon clarifies that relative deprivation involves "some subjective standard of equity and fairness, and … depends on the beliefs about economic justice held by individuals" (1999: 136). In addition, assessments of the discrepancy between current well-being and desired well-being often include a comparison to some other individuals who are perceived to have more. Structural inequalities and relative deprivation can work concurrently or independently to create a sense of frustration among individuals or groups regarding their access to water.

Disputes over the allocation or distribution of water resources among groups represent an important cause for violence at the intergroup level, as described by Gleick

in the Water Conflict Chronology. Tensions between groups intensify when the availability of water resources declines, or when one group appears to be commandeering shared water resources. For example, in January 2005, conflict erupted in Kenya when a group of land-owning farmers diverted river water to irrigate farmlands, at the expense of nomadic herdsmen (Gleick, 2006), while in in Afghanistan drought incited violent conflict between neighboring villages over the allocation and use of shared water resources (Gleick, 2006). As with hydropolitics at the interstate level, riparian position influences perceptions of the equity of allocation and use of water resources among groups within a state. For example, in India, the federal states of Tamil Nadu and Karnataka have been engaged in a decades-long dispute regarding the allocation of the Cauvery River (Kramer, 2004). Both states intend to appropriate the river flows for irrigation purposes, and view the other's intentions as interfering with their water rights. The contention between the two federal units has led to destruction of property, injury and a number of deaths (Gleick, 2006; Kramer, 2004).

Degradation of water resources can also be a cause for intergroup conflict (Kramer, 2004), because it intensifies group identity, "we-them", between those who degrade the water source and those who are affected by the degradation, and because it amplifies feelings of frustration and insecurity regarding the availability of clean water sources. Degradation of water resources, along with other forms of environmental stress, has been identified as a factor in Tajikistan's civil war (Kramer, 2004), as well as inciting disputes between farmers and tanners in the Palar Basin of the Indian state of Tamil Nadu, where the industrial effluents from the tanning industry significantly compromise

the quality of the river water and threatened the health and well-being of residents (Kramer, 2004). In 2001, fishermen in Zhejiang, China reacted to the destruction of their fisheries by damming a canal that carried industrial wastewater into their region, devastating the ecosystem of the neighboring province and threatening human health (Gleick, 2006).

Degradation of water sources, perceptions of misallocation of water, and water shortages have also led to civil unrest against units of government, both national and provincial or statal. In such situations, groups express discontent with the mismanagement of water resources by the state, whether it be lack of responsiveness, preferential distribution of water benefits, or privatization of the public good (Barlow, 2008; Gleick, 2006; Kramer, 2004). For example, water riots have occurred in India, Pakistan, Bangladesh, and China, where people protested against the inability of their government in addressing severe water shortages, and perceptions of unequal distribution of scarce resources based on group privilege (Gleick, 2006). Similarly, citizens in Cochabamba Bolivia protested against the city's decision to privatize the water supply system, which imposed enormous price hikes on drinking water and essentially prohibiting the access to water among the city's poor (Barlow, 2008). Civil unrest continued for several months and spread to other areas of the country before the government ordered soldiers to Cochabamba to quell the unrest (Barlow, 2008; Kramer, 2004).

Water infrastructure has been targeted by political opposition groups or other activist groups as a means of imposing political pressure on the state regarding the groups

demands. Gleick identifies these acts of violence as terrorism, such as when the Revolutionary Armed Forces of Columbia (FARC) damaged gate valves in the major dam that supplies water to Bogota in 2002 (Gleick, 2006), or, in the same year, when the Khumbuwan Liberation Front in Nepal bombed a hydroelectric facility in Bhojpur District and targeted other micro-hydro projects throughout western Nepal (Gleick, 2006). Civil unrest against the government also occurs as a reaction to state development proposals that impose dislocation, appropriation and destruction of land and ecosystems. In such cases, the state's efforts to ensure water security undermine the security and well-being at the human level. In Guatemala, civilians protested in opposition to the construction of the Chixoy hydroelectric dam that would require their relocation from their ancestral home, and in Sudan, students and other resistant groups have demonstrated against the construction of the Jonglei Canal which diverts the natural flow of the White Nile to increase the flows into Egypt (Gleick, 2006). However, in these cases, state actors often have the power advantage; in both examples, civilians were injured or killed by state actors. Sandra Postel further explains that major water projects can exacerbate tensions between groups "if newly created access to scarce resources worsen existing inequalities, further marginalizes the poor, or creates opportunities for the rich to 'capture' the resource" (Postel, 1996: 36). The intensified intergroup tensions can cause groups to react against the state which is seen as reinforcing the structural inequalities.

It has been well established that internal civil unrest, particularly when it becomes violent, threatens the stability and authority of the state (Rotberg, 2004). Thus, scholars and particularly policy makers are alert to the potential for resource scarcity conflicts to

undermine the stability of nations and regions. A recent USAID briefing paper acknowledges that limited access to water can provoke "incidents of interpersonal violence [that]… can become national and international concerns" (Kramer, 2004:1). The US Senate Committee on Foreign Relations recently disseminated a report that also recognizes the interconnections between water insecurity, intrastate conflict, and political and social stability (CFR, February 22, 2011). The Center for Strategic and International Studies asserts that the perpetuation of poverty and underdevelopment because of water insecurity "has serious implications for broader US national interests – present and future – across the globe." (Frist et al., 2009). Apprehension regarding the consequences of water insecurity and conflict escalates for failing and fragile states. Policy groups have begun to explore the intersections between water security, development, and state-society strength. However, in the academic literature detailed analysis of how water insecurity impacts failing states is lacking.

Summary

The goal of this chapter was to establish the critical importance of water security for human and economic development, and to outline the links between water insecurity and conflict. To do this, I discussed the pervasive role water plays as an essential input into all human life and nearly ever social and economic activity, as well as discussing the concept of the security-development nexus. Water scarcity was discussed at length as a major type of water insecurity, and the cause for much of the concern over interstate water wars. A review of water relations between states demonstrates that major military

conflict between states has not occurred as a direct result of water disputes. However, water has been implicated in conflicts between states, either as a tool or a target of war. Moreover, securing water access has been an underlying trigger for interstate conflict. More importantly, water insecurity, more specifically water scarcity, has incited violence at the subnational level. It is expected that as societal and environmental pressures increase in the coming years, as a result of population growth, economic development and climate change, water insecurity will also intensify for millions of people living within water stressed states. Under such conditions, historical trends of cooperative water relations may not endure. Moreover, as populations experience growing levels of human water insecurity, and subsequent consequences on their health, well-being, and livelihoods, public demand for the state to fulfill its obligation to promoting security and public welfare will intensify, and possibly overwhelm the state's capacity to respond.

CHAPTER 3

STATE FAILURE: DEFINITION, CAUSES AND INDICATORS

Over the past thirty years, concerns over the rise in civil wars, political upheavals, and state-sponsored terrorism have lead to significant research on understanding the phenomenon of state failure and determining its causal factors. The concept of failed states emerged in the early 1990's, as the pattern of state disintegration following the end of the Cold War became strikingly apparent. The violence and human suffering that accompanied the implosion of countries like Somalia, Rwanda, Liberia, Cambodia and Yugoslavia shocked the international community and motivated discussion and debate regarding the responsibilities of the state and the international community when states fail to oblige their responsibilities. The terror attacks on September 11, 2001 reinvigorated the world's attention to the problem of failed states and alerted the major powers that the consequences are not limited by territorial boundaries.

Most definitions of state failure concentrate on defining failure in opposition to the ideal state, focusing particularly on the inability of the state to fulfill its most fundamental obligations – exercising a monopoly of the legitimate use of force and demonstrating the ability to control its territory (Brooks, 2005; Piazza, 2008; Rotberg, 2002). The modern concept of the state was affirmed with the Montevideo Convention (1933), which defined states of having a permanent population, a defined territory, a

government, and capacity to enter relations with other states (Rosenau, 1989). In the current state-centric international system, states possess certain rights and obligations that confer the essence of stateness. As sovereign entities, states enjoy constitutional independence from other states and hold the right against interference by external forces (J.Jackson, 2003; R. Jackson, 1987). Likewise, states are obliged to control their borders, abide by international treaties and commitments, and strive to maintain peaceful relations with other states. States are also expected to function for the benefit of their citizens, with the principal responsibility of providing a security guarantee (Rotberg, 2002). In addition to security, states are expected to deliver other public goods that promote a functioning society, including infrastructure and a system for fiscal extraction and redistribution of resources and public welfare (Gros, 1996; Rotberg, 2004).

Therefore, the concept of state failure applies to situations in which the political structures of a state, such as balance of power between branches of government, are in crisis (Langford, 1999), state institutions are weak or absent (Francois and Sud, 2006; Rotberg, 2002), a system of fair law and order is absent (Ghani and Lockhart, 2008), and societal cohesion disintegrates (Francois and Sud, 2006; Langford, 1999). In such situations, the central government is unable to exert its authority throughout its territory; governance capacity is deficient; the economy is weak or in decline; and human insecurity is profuse due to high levels of interpersonal violence and low human development (Brooks, 2005; Helman and Ratner, 1992; Francois and Sud, 2006; Rotberg, 2004). In addition to the inability of the state to execute its authority, states that experience state collapse also suffer societal collapse, in which social cohesion dissolves

(Zartman, 1995: 6) and the state "no longer [acts as] as a source of identity and social meaning" (Langford, 1999: 64).

In addition to generating tremendous detrimental consequences within the country, the failure of state institutions poses a significant threat to regional and international security to which the international community has not been adequately able to respond (Brooks, 2005; Carment, 2004; Ellis, 2005; Langford, 1999). Failed states undermine the stability of neighboring states by permitting the rise of illicit arms trade and mass migration of refugees across borders, and are viewed as serving as training sites for international terrorist groups (Patrick, 2007; Piazza, 2008; Rotberg, 2002; 2004). Research has demonstrated that countries bordering countries experiencing civil unrest are more likely to experience negative economic effects, and the potential of civil violence (Collier, 2007; Francois & Sud, 2006; Rotberg, 2002). Failed states threaten one of the most fundamental assumptions of many international theorists and practitioners that states offer the optimal form of political organization and stability (Helman and Ratner, 1992; Rotberg, 2002).

For the purposes of this thesis, I define state failure as a phenomenon in which states, being the government institutions and offices and the political leaders directing those offices, are no longer capable or willing of ensuring the physical safety and public welfare of all peoples living within their territory. State failure includes situations in which the mutually reinforcing bond between state and society has been severed, due to neglect or purposeful harm, and in which the state is afflicted with weakened authority and legitimacy, particularly in the eyes of the society.

Not all of these ills have to be manifest in order for states to be considered failed, though the dissolution of the governing capacity and authority are necessary features to precipitate failure. Because of the variability of symptoms, both in terms of prevalence and intensity, the concept of state failure encompasses a spectrum of severity. Weak and fragile states mark one end of this spectrum, comprising of states that demonstrate a handful of problematic features placing them at risk of failure, but which maintain some level of functional authority and legitimacy. At the other end of the spectrum are collapsed states, such as Somalia, which have no functioning government and exhibit extreme lawlessness (Zartman, 1995); such "states" are barely states as commonly conceived, as even the territorial boundaries which once defined them are contested (Brooks, 2005). While this spectrum provides some utility in identifying the extent to states are experiencing symptoms of failure, several scholars have argued that state fragility and state failure is not an inevitable unidirectional trajectory or even a guaranteed path (Carment, 2003; Gros, 1996). It should not be assumed that if a state shows signs of weakness, this state is doomed to fail. States can remain in a condition of weakness for decades, without ever experiencing true state failure. Therefore, the term state failure has been applied to an array of states that exhibit symptoms of state failure, even if they demonstrate some ability to function.

This thesis contends that water insecurity creates unmanageable situations for failing states because it undermines many of the critical areas that support positive state-society functioning. State failure occurs when various political, societal and economic stressors overwhelm the capacity of the state. Water insecurity contributes to these

challenges by revealing deep-rooted weakness and precipitating immediate contingent pressures. While academics and policy makers recognize that failed states will experience the most challenge in responding to water stress and the changes induced by climate change, minimal work has been done to explore the implications of water insecurity on failing states, particularly in understanding the increased pressures placed on state institutions to respond to water stress. Thomas Homer-Dixon (1999) and Colin Kahl (2006) have each proposed arguments regarding the causal pathways that lead from environmental scarcity and stress to violent interpersonal conflict and civil unrest. In this chapter, I will discuss the key indicators and causes of state failure, and discuss the proposals of Homer-Dixon and Kahl as they relate specifically to the connections between water insecurity and state failure. I will extend their analyses to explicate the ways in which water security relates to foundational aspects of state-society strength, and demonstrate that the absence of water security undermines a country's economic potential, human security and human development, and reveals a weakened state capacity.

Political, Economic, and Societal Indicators of Failure

Due to the grave concern centered on the causes and consequences of state failure, significant research has been carried out to determine the political, economic, and societal indicators of failure that may alert the international community to the potential threat of state collapse. This work started in the early 1990's with contributions from Helman and Ratner (1992), I. William Zartman (1995), and Jean-Germain Gros (1996), who were

responding to the atrocities occurring in Somalia, the former Yugoslavia and Rwanda. Since this early work, numerous other indices have been developed to help explain the increasingly frequent phenomenon. Among these indices, the Country Indicators for Foreign Policy (CIFP), the Political Instability Task Force (PITF), and the Fund for Peace CAST system provide the most extensive methodologies and sets of indicators for identifying and determining cases of state failure.

Carlton University's Country Indicators for Foreign Policy Fragility Index categorizes state-robustness/fragility indicators along six dimensions, covering governance, economics, human development, demography, security, and environment. Their analyses also include assessments of a country's authority, legitimacy and capacity, as well as monitoring of major political, economic or societal events occurring within the country (CIFP, Methodology, http://www.carleton.ca/cifp/). This approach recognizes that state weakness and state failure are dynamic processes that have different causes and manifestations in different countries. Country Indicators for Foreign Policy proffers that by employing this multidimensional approach they are better able to determine effective policy strategies for intervention and prevention.

Since the mid 1990's, the Political Instability Task Force has employed a system that enables them to compare hundreds of case studies of civil conflict, political instability and state failure to over a thousand political, demographic, economic, social and environmental variables to establish a set of indicators that would statistically explain state failure with a high level of certainty (Political Instability Task Force). Consistently, over five years of analyses, four factors have been identified as primary determinants of

political instability and state failure: regime type, low levels of material well-being (e.g. high infant mortality rates), low trade openness, and presence of major civil conflict on two or more bordering countries (Political Instability Task Force, Phase IV Report). These factors are easily measured by outside observers, as agencies and organizations have been tracking human development and economic activity globally for decades.

The Fund for Peace developed a similar assessment tool for identifying potential situations of conflict. This system, Conflict Assessment System Tool (CAST), incorporates both quantitative and qualitative indicators that are entered into a rating system that allows for trend analysis. The assessment tool also takes into account the capacity of core state institutions and any unanticipated factors that can contribute to the risk of conflict. According to the Fund for Peace, CAST is "widely sought after as a structured tool that can identify and anticipate failing states" (Fund for Peace website). The indicators that the CAST system monitors include demographic stress, group grievances, uneven development, declining authority of the state, poor human rights record, and increased security apparatus (see Fund for Peace website). Using the CAST system, Fund for Peace collaborates with Foreign Policy to publish the annual Fragile State Index. Below, I will discuss the major political, economic, and societal indicators that have been identified by these and other indices.

Political Indicators of Failure

Throughout the literature on state failure, academics and policy makers highlight that state failure occurs when core elements of a state's sovereignty – authority,

legitimacy, or capacity – devolve. This trinity comprises the central component of the Country Indicators for Foreign Policy fragility index. Researchers at Country Indicators for Foreign Policy assert that dysfunction or weakness in any of these critical features of stateness places a given state at risk of failure (Carment, Prest and Samy, 2007). Country Indicators for Foreign Policy defines authority as the ability of the state to project power and governance over its entire territory and to fulfill its responsibilities as a sovereign entity, particularly a security guarantee to its citizens (Carment, Prest and Samy, 2007). In the Westphalian concept of state sovereignty, authority also implies independence from other entities in the implementation of domestic and foreign policy (Jackson, 2003). The second pillar of stateness is legitimacy, which represents the level of affiliation and support the public gives to the state and the policies it chooses to implement (Carment, Prest and Samy, 2007). Homer-Dixon defines legitimacy as "the strength of the state's moral authority; i.e. the extent to which the populace obeys its commands out of a sense of allegiance and duty, rather than as a result of coercion or economic incentive" (Homer-Dixon, 1999: 100). The concept of legitimacy also refers to the recognition bestowed on a state by other sovereign states (Jackson, 2003). Country Indicators for Foreign Policy defines capacity as the ability and willingness of a state to "mobilize public resources for productive uses" (Carment, Prest and Samy, 2007:15). Capacity represents a critical area of state functioning, because it encompasses fiscal and human capital, political will, and efficient institutions, which allow the state to operate proficiently.

In failed and failing states, some aspect of the state's authority, legitimacy or capacity has been weakened. Failed states are typically described as those states which

have lost control over their territory (e.g. authority) (Brooks, 2005; Jackson, 1987; Rotberg, 2002; 2004; Zartman, 1995), that are unable or unwilling to meet their obligations to their citizens (e.g. capacity) (Brooks, 2005; Francois and Sud, 2006; Rotberg, 2002; 2004), and that no longer receive the support and allegiance of the various people groups within their borders because these groups feel neglected by the state (e.g. legitimacy) (Dorff, 2005; Francois and Sud, 2006; Kaplan, 2009; Langford, 1996). Tonya Langford (1999) emphasizes that state failure is a reflection of a state's declining capacity and its "right to rule" (1999: 64). Moreover, weakness in one area diminishes the strength of the other areas. As Homer-Dixon explains, "a widening gap between rising demands on the state and the state's actual performance … erodes state legitimacy…. As the state weakens, the social balance of power can shift in favor of groups challenging state authority" (1999:103). Dissolution of a state's authority, legitimacy or capacity engenders negative repercussions for multiple dimensions of state functioning and societal well-being, including political and economic malfeasance, human insecurity, and intergroup conflict.

In addition to demonstrating weakness in the core characteristics of state functioning, failing and failed states exhibit a number of various political maladies. A comparison of the indicators outlined by the Country Indicators for Foreign Policy, the Political Instability Task Force and the Fund for Peace reveals agreement on many of the possible dimensions by which to assess a state's level of stability or fragility. In determining political indicators for assessing instability or potential internal conflict, the Political Instability Task Force, the Country Indicators for Foreign Policy and the Fund

for Peace emphasize government type as a critical variable. The Political Instability Task Force identifies regime type as their key variable in determining whether a state is at risk of a political crisis, while the Country Indicators for Foreign Policy focuses on 'Level of Democracy'. The Fund for Peace does not have an explicit category for governance type in the list of political indicators, however they do list "emergence of authoritarian, dictatorial or military rule in which constitutional and democratic institutions and processes are suspended or manipulated" as a sub-indicator under *Suspension or Arbitrary Application of Rule of Law* (Fund for Peace). In addition, the Fund for Peace identifies strong political leadership with governance capacity as one of the core institutions needed for stable states.

The Political Instability Task Force operationally defines regime type as the "patterns of political authority evident not only in formal state institutions but also in the organization and behavior of key political actors" (Bates et al., 2003: 33). According to the Political Instability Task Force, regime type refers to whether a state is considered a democracy or an autocracy, and within that dichotomy, whether the state is strong or weak. Over the course of a decade of research, the Political Instability Task Force has determined that partial or limited democracies and autocracies with political competition are the most at risk of political instability, while full democracies and closed autocracies are less likely to experience political instability. Countries that are considered full democracies are characterized as having established procedures for ensuring open and competitive political participation, competitive elections, and strong constraints on the powers of the chief executive. Optimally, such characteristics of a state's political

structure promote the state's legitimacy, and embrace representation of all segments of society. In contrast, political stability is maintained in full autocracies through suppression/oppression. In full autocracies, the chief executive comes to power through force or patronage, and benefits from the absence of constraints on his power and authority. While the full autocracy may not possess the legitimacy of a full democracy, stability is maintained through strict control over all affairs of the state.

Partial democracies and autocracies with political competition experience a greater risk of instability than strong full democracies or closed autocracies because they have inconsistent patterns of political authority (Bates et al., 2003). For partial democracies, political stability is compromised because of factional political competition or minimal constraints on the executive's power, or in some cases both. Weak partial democracies are almost 30 times more likely to experience a political crisis than full democracies or closed autocracies (Bates et al., 2003). Autocracies that cannot suppress political competition are less at risk than the weak democracies, however, these regimes also face the possibility of political upheaval because there is no real opportunity for political participation, open discourse, or venue to address the issues raised by the opposition (Bates et al., 2003).

Like the Political Instability Task Force, the Country Indicators for Foreign Policy uses the Polity IV dataset for their analysis of level of democracy. This dataset ranks countries across a two dimensional continuum, with autocracies on the negative end (with scores ranging from -10 to -6) and democracies on the positive end (with scores ranging from 6 to 10) (Polity IV Project, http://www.systemicpeace.org/polity/polity4.htm).

Carment, Prest and Samy (2007) explain that their multidimensional model for assessing fragility presents a u-shaped relationship between level of democracy and level of fragility. This u-shaped relationship would suggest that countries with neither strong autocratic governments, nor strong democratic governments are more likely to have higher/positive scores on the fragility index (Carment, Prest, and Samy, 2007).

Instead of concentrating on governance type per se, the Fund for Peace include indicators that point to systemic problems in a country's political culture and the relationship between state and society. In their CAST framework, corruption and criminalization of state entities underscore critical weaknesses in the state's authority and legitimacy. Such weaknesses can be assessed by the level of transparency and accountability within government, the extent to which elections are open or contested, and the rise of insurgencies (Fund for Peace). In addition, the militarization of the state, politicized ethnic factionalism, and decline of rule of law (Fund for Peace) also draw attention to the inability or unwillingness of state institutions to govern for the entirety of the populace.

Economic Indicators of Failure

The demise of state institutions also manifests in the economic sphere. As in other areas, as states begin to show signs of failure, the capacity of state institutions to make good economic policy or to manage its fiscal responsibilities falter, such as fiscal extraction and redistribution of wealth (Caporaso, 1989; Rotberg, 2004; Van de Walle, 2004). In some cases, the ruling elite siphon monies for their personal accounts rather

than allocating it for public services; Mobutu Sese Seko exemplified such kleptocratic tendencies (Rotberg, 2004). In other cases, opposition groups attempt to seize control of the state and the state coffers, leading to drawn-out and economically damaging civil wars (Van de Walle, 2004). Other failing states lack the governing capacity to fulfill its fiscal responsibilities, and so are characterized by economic stagnation (Van de Walle, 2004). When states show signs of failure, national and international investment diminishes, and with it, job growth and the availability for basic goods and services (Rotberg, 2004). Such impacts on the economy of these states persist for years (Collier, 2007). Collier underscores that economic stagnation heightens the risk that the failed state will revert to civil conflict within the first ten-years of any attempt to rebuild (2007: 27).

There are a number of economic variables that have been identified as potential indicators of state failure. According to Carment, Prest and Samy (2007), the Country Indicators for Foreign Policy has determined the most significant economic predictor of stability/instability to be level of development, which they define as per capita GDP. In addition, Country Indicators for Foreign Policy looks at a number of economic variables, including the size of the economy, external debt as percent of GNI, the size of the informal market, unemployment rates, and trade openness (Country Indicators for Foreign Policy website). The Political Instability Task Force also identified level of trade openness as one of their major predictive factors. Trade openness is defined as the ratio of a country's exports and imports to the country's GDP (Bates et al., 2003). Trade openness denotes the extent to which a country is integrated into the regional and global

economy. In addition, trade openness provides an indication of the robustness of the country's economic health and the country's attractiveness to foreign investors. According to Political Instability Task Force's research, countries with low levels of trade openness are 50 times more likely to experience political crises than countries with more open trade policies.

In an effort to explain the relationship between trade openness and political stability, the Task Force proffers multiple interpretations. One interpretation focuses on the positive implication that trade openness directly and indirectly underpins political stabilization because it promotes economic growth and democratic processes. Another interpretation implies that the low level of trade openness is linked to inefficiencies in the political leadership, either due to corruption or patronage, or to poor business environments in which there are limited regulations in place to protect property and enforce contracts (Goldstone et al., 2000). This interpretation suggests that the correlation between trade openness and political instability may be connected by a third factor, such as weak governance capacity.

Another approach to identifying the economic indicators of state failure is to examine structural and contingent factors of a given state. Nicholas Van de Walle (2004) asserts that while structural factors predispose some states to political and economic weakness, contingent factors precipitate a state's demise. Van de Walle (2004) defines structural factors as those economic and sociological characteristics that are fixed in the short-to-medium term, such as the structure of the economy, level of population density, and governmental capacity. He explains that countries with low population density,

heavy reliance on agriculture, and weak governmental capacity face enormous challenges in fulfilling expected fiscal obligations of managing a system of taxation and redistribution (2004). Van de Walle overlooks several important structural factors, including level of infrastructure to promote business development, geographical endowments both in terms of physical location and availability of natural resources, and level of education.

For Van de Walle (2004), structural factors predispose states toward weakness, however, contingent factors cause states to fail. He defines contingent factors as short-term events that result from bad economic policy making or from the influence of donors (2004). Poor economic policy making, such as inability to extract tax revenues or establish a viable budget, reflects weaknesses in governance capacity and lack of political will. As a result, foreign investors may withdraw their support, the state has a tighter spending capacity, and it incurs more debt. Additionally, states with higher reliance on international donors are more at risk of experiencing economic weakness because they have more debt and are obliged to the policy specifications outlined by the donors (Van de Walle, 2004). Moreover, heavy reliance on aid has the potential of undermining the state's ability to establish independent economic strength.

Van de Walle gives only cursory attention to other potential contingencies that can have huge impact on the economic viability of a state, such as instability in neighboring countries, civil violence, or environmental disasters. This negligence is faulty because it diminishes the importance of such internal and external factors in weakening a state's capacity, legitimacy and authority. The Fund for Peace recognizes

that such contingencies have critical implications for the stability of states, and have incorporated a process for identifying, assessing and monitoring any unanticipated events that provoke instability and conflict. This process, called STINGS[2], stands for surprises (e.g. currency collapse), internal or external triggers (e.g. assassinations or coup d'état), unique idiosyncrasies (e.g. non-contiguous territory, deference to authority), national temperaments (e.g. cultural or religious ideations), and spoilers (e.g. excluded or dissatisfied groups). This aspect of the CAST assessment recognizes that while internal conflict and state failure may have common manifestations across countries, the circumstances that cause any given state to fail are unique.

Societal Indicators of Failure

States that suffer from weak political systems and poor economic capacity also tend to exhibit societal issues that further challenge the state's capacity and weaken its authority and can potentially instigate instability. Societal factors, such as a skewed demographic distribution, high levels of urbanization, the presence of refugees and internally displaced people, intergroup tensions, and low human development, can act as stressors that overwhelm a state's capacity to govern and can undermine state authority and legitimacy. Many academics categorize low levels of societal well-being as a consequence of state fragility, implying that the incapacitation of the state institutions results in dropping life expectancies, increasing rates of infant and maternal mortality, rapid spread of disease, and economic stagnation (Rotberg, 2004; Snodgrass, 2004;

[2] http://www.fundforpeace.org/web/index.php?option=com_content&task=view&id=107&Itemid=145#4

Zoellick, 2008). However, low levels of human development also can be a cause of instability as human security becomes more precarious.

The three major indices of state failure each include some set of demographic and societal indicators, which they employ as signals of possible failure. Under the domain of demographic indicators, the Country Indicators for Foreign Policy includes life expectancy, population density, urbanization rate, estimated rates of migration, and population diversity in regards to ethnicity and religion. Similarly, the Fund for Peace emphasizes demographic pressures that arise from increased demands on limited resources particularly between divergent groups, as a critical risk factor for state failure. As examples, the Fund for Peace lists high population density and internal displacement of peoples. The Political Instability Task Force focuses primarily on indicators of societal well being, such as infant mortality rate. Serving as proxies for other indicators of societal and material well-being, these types of indices reveal a negative feedback loop in which gaps in the state's ability to ensure the security and well-being of the population creates greater demands on the state which extend beyond its ability to cope.

Demographic pressures pose a considerable challenge to many countries, particularly to underdeveloped countries. Population density, population growth, urbanization, and imbalances in demographic groups intensify the demands placed on state institutions for public health, job creation, and public welfare. Among the demographic indicators identified by the three indices as potential factors that contribute to instability, youth bulge (e.g. the percent of population that is under the age of 25) is the only one mentioned by all three. This consistency reflects current assumptions that

countries with more young people are often considered more volatile, particularly when countries have few opportunities for employment, political voice and improved quality of life (Staveteig, 2005). Staveteig (2005) explains that it is not the ratio of young people to adults that is the key contributor to instability per se, but rather the growing level of frustration and alienation experienced by these youth because resources and opportunities do not exist in equal number. She concurs with others in the field that disenfranchised youth are more likely to involve themselves with opposition movements or religious extremist groups that take violent measures against the state. Therefore, excess youth, when matched with limited opportunity, can be viewed as a hot point for states at risk of failure.

High levels of groupness signify another societal factor that can add stress on a state's authority, legitimacy or capacity, as demonstrated by many of the current failing or failed states, including Afghanistan, Somalia, and the Sudan. Groupness refers to the extent to which individuals identify with a specific ethnic, linguistic, religious, socio-economic or other group rather than with national identity. Heterogeneity on its own is not bad for a state. However, challenges arise when structures within society appear to benefit one group over other groups (Homer-Dixon, 1999), or when groups seek to revise the national borders of the state along group lines, either through secession or irredentism (Miller, 2010; Rotberg, 2002b). Benjamin Miller explains that revisionist aspirations relate to state-nation incongruence, which he explains as occurring when the current political boundaries of a state do not reflect the national affiliation of the peoples living within the regions of said state (2010: 75-76). He further qualifies the concept of state-

nation incongruence by noting that some politically defined states are comprised of numerous national or ethno-linguistic groups leading to internal incongruence, while other states experience external incongruence because they share a single ethno-linguistic group with a neighboring state (Miller, 2010). State-nation incongruence challenges the state's authority and legitimacy because the populace relies on other entities to provide basic services. Moreover, it signifies that the state institutions have not been capable of coalescing a broader national identity that relates to the political entity of the state.

Homer-Dixon notes that social psychological theories of group behavior use group identity to explain intergroup conflicts, as groupness creates "'we-they' cleavages" (1999:136). Group identity allows groups to place blame on other groups for the frustration or deprivation experienced. Rotberg affirms this notion, explaining that "the civil wars that characterize failed states usually stem from or have roots in ethnic, religious, linguistic, or other intercommunal enmity" (2002b:86). States in which inter-group tensions are high tend to be characterized by parochial politics on the part of the ruling elite, and perceptions of oppression and negligence on the part of the marginalized groups. Such states exemplify Gros' 'captured' state (Gros, 1996) in which elites from a specific communal group seek to use their control of the state for their own benefit. In such states, overt or implicit ethnic discrimination becomes the norm, and the state can be accused of overlooking its sovereign responsibilities to provide security and basic welfare for all the various people groups within its boundaries. Further, parochial politics characterize the less stable regime types which serve as the Political Instability Task Force's primary predictor of political instability. Both weak partial democracies and

autocracies with some political competition often experience factionalized politics, usually along communal group lines.

Human development indicators also reflect the status of a state's strength or fragility, as human development is often a direct manifestation of political priorities and state capacity to act upon those priorities. Most often, failed states are among the poorest countries in the world, with also the lowest ranking of human development (CIFP, Human Development Reports). Variables of human development that have been taken into account by Country Indicators for Foreign Policy and Political Instability Task Force include literacy rates, education enrollment rates, mortality rates, rates of HIV infection, and access to clean water sources and sanitation. In their analyses, the Political Instability Task Force found infant mortality rates to be one of four major predictors of political instability, along with regime type. The Political Instability Task Force explains that infant mortality rates are highly correlated with risk of political instability because they are more sensitive to the reality of societal well-being than per capita income (Bates et al., 2003). Infant mortality serves as a robust proxy for overall health and well-being of society because it reflects the quality of and access to medical facilities, shelter, and clean drinking water. The Political Instability Task Force also expresses a suspicion "that infant mortality is sensitive to economic distortions caused by poor governance and official corruption" (Bates et al., 2003:46). The Political InstabilityTask Force researchers emphasize, however, that their analyses do not identify low levels of material well-being as a major cause of political instability, even though infant mortality rates are significantly correlated with political instability. Instead, high rates of infant mortality

can be a symptom of other issues, such as poor economic policy making or low levels of economic development, which are more likely to be linked to political instability than material well-being overall.

State Failure and Violence

The combined political, societal and economic pressures that are typically found in failed and failing states often manifests in violence, though Carment, Prest and Samy (2007) emphasize that not all failed states exhibit interpersonal violence or violent civil unrest. Like other societal factors, interpersonal violence is seen as both a consequence and risk factor of state failure. Kasfir (2004) explains that when the state's authority disintegrates, the process creates a situation of domestic anarchy that leads individuals within that state to react to the threat of violence either in self-defense or violent predation. Self-protective behavior can initiate cycles of interpersonal violence, as it heightens the sense of insecurity and further impairs societal trust (Kasfir, 2004). Violent predation occurs when individuals or groups use whatever means possible to obtain the possessions of other individuals or groups for their self-benefit (Kasfir, 2004: 65). Such means could include banditry, looting, and robbery, or more formal criminal means of manipulation, such as gang or mob syndicates (Rotberg, 2002). Francois and Sud (2006) emphasize that the disintegration of central authority and the state's monopoly on legitimate use of force induces "violent contestation over who will control the state" and the various benefits and power that comprise sovereignty (144), including natural resource rents and international aid. The inability of the state to impose rule of law and

provide security for its people can result in a state of anarchy which may lead to violent outbreaks.

There are also instances when the state itself may be the perpetrator of violence, such as state-led discrimination or repression against communal groups. The Political Instability Task Force focuses on these types of violence as indicators of state failure, as they reflect a level of political malaise and social disharmony that threatens the cohesion of the state overall, regardless of the outcome of ethnic war (Bates et al., 2003). State-led violence provides a clear indication that the state is unwilling to protect and promote the well-being of the whole populace. The Rwanda of the 1990's exemplifies this type of failure. While the state demonstrated strong control of many of the core institutions of the state, the political elite used their control of power to carry out genocide.

The danger of ethnic conflict and parochialism to the stability of a state is not limited to internal politics. States that share borders with two or more countries in the midst of an ethnic or major armed civil conflict are also considered to be at greater risk of experiencing political instability themselves than those states which reside in a good neighborhood (Collier, 2007; Bates et al., 2003). In addition, because borders were often arbitrarily demarcated by colonial powers, ethnic groups often straddle the literal territorial boundaries of two states (Miller, 2010; Bates et al., 2003), and thus may have a vested interest in the conflict occurring across the border. In discussing the various causes of persistent poverty, economist Paul Collier (2007) also asserts that bad neighbors are detrimental to the economic and socio-political stability of a state. When a state is bordered by another state in conflict, the former is likely to experience numerous

ramifications, both political and economic. Major civil or ethnic conflict often results in a mass influx of refugees seeking asylum, which places great social welfare demands on the host state (Collier, 2007; Rotberg, 2004). Guerrilla and state-backed soldiers, along with dangerous arms, may cross borders in pursuit of opponents, which significantly heightens the insecurity of civilians living along those borders (Collier, 2007). Finally, violent conflict incurs huge economic costs for both the host state and its neighboring states, depressing growth rates by at least 2% a year (Collier, 2007).

Failed and failing states exhibit a number of problematic features that create national, regional and potentially global insecurity. In addition, failed and failing states significantly impede the human development potential of people living within their contested borders, and heighten experiences of human insecurity. Stifled human development and intensified feelings of insecurity deepen the crisis within the state. To date, the international community has been uncertain about how to address the challenges presented by failed and failing states, primarily because intervention is expensive and because intervention violates conceptions of sovereignty. Moreover, the validity of the concept itself has been questioned as being ethnocentric, neo-imperialistic, and pejorative (Herbst, 2004; Jackson, 1987; Richardson, 1996). However, the concept of "failed state" provides a necessary mechanism for discussing the problematic outcomes of state disintegration and intensive civil conflict. Whether we call it state failure or not, we cannot deny that some states do actually fail, and this process creates extreme threats to the physical safety and overall well-being of the persons living within that territory. Therefore "failed state" allows the international community to identify and group states

that present symptoms of failure and to work with those states to attempt to prevent complete failure and safeguard the state's populations.

A Proposed Analysis Explicating the Ways by which Water Security Supports State Strength

While the literature on state failure comprises numerous political, societal and economic factors that both precipitate failure and alert the international community of potential problems, little consideration has been given to environmental factors as potential risk factors for state failure. Even less attention has been given to the issue of water insecurity, despite the evidence that water stress creates enormous political, economic and societal challenges for states. While some environmental concerns are noted, such as the expected negative impacts induced by climate change, water insecurity and other forms of environmental challenges are often treated as contingent events that compound upon an already precarious situation. For some scholars, such as Collier (2007), natural resources are considered in the set of causal factors, but generally they include only non-renewable resources, such as oil or precious minerals, which attain higher value than renewable resources such as water, and are therefore more contested.

I propose that water insecurity represents deep-rooted issues that present significant risk factors for failing and failed states. Water insecurity implies low state capacity, particularly in regards to short and long term planning, insufficient institutions, and inadequate infrastructure. A deficit in water infrastructure and institutional capacity is likely to be symptomatic of broader incapacitation across other domains. The inability

to secure water resources hinders economic growth and human productivity. Water insecurity places additional stress on intergroup relations, intensifying feelings of inequalities between groups, which can test the state's monopoly of legitimate use of force and increase demands for state allocated social welfare. Water insecurity therefore undermines economic security for the state, as well as livelihoods, food security, and human health and well-being, all of which create a negative feedback loop that can undermine the capacity and legitimacy of the state.

To explore the interplay between water insecurity and state failure, I will first review the arguments of two political scientists who provide useful frameworks for understanding the interrelationship between water security and state-society stability/water insecurity and state failure. Thomas Homer-Dixon (1999) and Colin Kahl (2006) have each attempted to identify causal pathways from environmental scarcity to violent conflict (Homer-Dixon) and state failure (Kahl). The basis of their arguments is similar; both argue that environmental stress increases the amount of demand and pressure placed on states and that the reaction in weak states is often violence. Both Homer-Dixon and Kahl utilize neo-Malthusian theories, though Homer-Dixon places primary emphasis on the structural inequalities and political-social economy of states as inducing environmental stress. Structural inequalities denote the explicit and implicit imbalances within a society in regards to who controls political power and wealth, and how access to political goods is determined.

The essence of Homer-Dixon's argument is that environmental scarcity "acts as a deep underlying stressor of social systems [that] produces effects by interacting with

contextual factors unique to society" (1999:81). Homer-Dixon (1999) warns against the tendency among analysts who assume that environmental scarcity act only as an aggravator that triggers preexisting problems within the socio-political domain. Instead, he notes that environmental scarcity undermines state capacity by increasing the political and financial demands on the state, intensifying competition for resources between groups, exacerbating structural imbalances within society, and eroding people's trust in state-society relations (Homer-Dixon, 1999). Social segmentation and disruption of social cohesion represent major challenges to the state in Homer-Dixon's proposition, significantly increasing the potential for violent conflict between groups or against the state.

According to Homer-Dixon (1999), structural inequalities within society represent the primary cause of environmental scarcity, because they heighten the experience of disenfranchisement and inter-group tension. Structural inequalities are exaggerated by two social phenomena: resource capture and ecological marginalization. Resource capture occurs when powerful groups within a society abuse their power by "shift[ing]…laws and institutions governing resource access" in their favor (Homer-Dixon, 1999:15). Resource capture exaggerates the experience of scarcity for the powerless, while ensuring resource security for a small minority. Ecological marginalization arises when politically and economically marginalized groups are pushed away from ecologically productive areas toward ecologically fragile areas, which increases resource depletion and aggravates the experience of poverty.

Violence manifests when individuals or groups perceive other individuals or groups as reducing their access to or quality of a resource. Homer-Dixon explains that environmentally induced migration provides a salient example of this, as it exaggerates the "we-they" animosities between groups (Homer-Dixon, 1999). Environmental scarcities can also incite violence against the state by creating a "crisis of legitimacy" in which "state's failure to meet local needs depresses its legitimacy" (Homer-Dixon, 1999:102) and "people … believe that the state is responsible for their [economic] hardship" (Homer-Dixon, 1999:144). In such cases, people's experience of deprivation may be so severe that they are compelled to violent reaction against the state.

Like Homer-Dixon, Kahl (2006) asserts that environmental pressures precipitate intra-state violence that occurs in situations of state failure. Kahl attempts to expand Homer-Dixon's argument by combining environmental stress, particularly renewable resource depletion or degradation, with demographic pressures, such as rapid population growth and urbanization. He explains that demographic and environmental stress (DES) overwhelms state capacity, diminishes state revenues, weakens the state's reach throughout its territory, and creates a security dilemma for the people within the territory (Kahl, 2006). Kahl hypothesizes that DES increases the risk of state failure by substantially compromising the capacity and authority of the state and intensifying human insecurity, which opens opportunities for anti-state opposition. While many descriptions of state failure include situations in which state elites act violently against groups within their domain, Kahl differentiates this type of violence from state failure. For Kahl, state failure refers only to anti-state violence or inter-personal violence, while

state exploitation encompasses the type of violence that is state-initiated. In state exploitation, the state elites might manipulate their power and their group affiliations to incite animosities between groups in such a way as to promote and protect their control of power (Kahl, 2006).

While Kahl's hypothesized links between DES and state failure held much promise, his assertions fall short. He appears hesitant about the role environmental and demographic pressures in weakening states and accelerating the possibility of failure. Although he is right to acknowledge that environmental and demographic pressures can never be the ultimate or direct cause for failure, he seems to diminish the importance of these factors, even though they form the basis of his argument. He explains that "even when DES plays a role in conflict, it does so as part of a causal chain that results in organized violence only when other intervening variables are also in play" (Kahl, 2006: 58-59). These intervening variables include the level of groupness within the state and extent to which the institutional framework of the state is inclusive or exclusive. From his analysis, civil strife is only likely to occur when there is high DES, coupled with high-level of groupness and low institutional inclusivity. More to the point, civil strife as a result of DES is unlikely if either of the other two variables are positive. Kahl's own analysis identifies these intervening variables as being more influential on the outcome of state failure than the extent of DES.

The most important contribution emerging from Kahl's argument is the assertion that environmental pressures, combined with demographic pressures, represent "medium to long-term sources of state weakness" (2006:44), which are often overlooked as causes

because their impact is not immediate. Kahl's premise, along with Homer-Dixon's asserted relationship between environmental scarcity and violence, will serve as the basis for an analysis of the ways in which water insecurity undermines state-society strength and makes states vulnerable for failure. These frameworks are useful because they begin to identify the implications posed by environmental strain on state functioning. However, neither Homer-Dixon nor Kahl provides an in-depth discussion of the connections between water issues and state strength/weakness.

State strength and state failure represent inversions of each other, and thus many of the indicators for state failure would apply to state strength though in reverse. For example, states experiencing failure exhibit deficiencies in state capacity, high levels of human insecurity, and inability of the state to demonstrate authority throughout the territory. On the other hand, state strength can be defined as the demonstrated application of institutional capacity, political will, and authority to function in the manner expected of states. Strong states promote the overall well-being and development of society, and are exhibit the intention and capacity to ensure physical security and public welfare. Strong states typically exhibit vibrant economies, democratic institutions, fewer structural inequalities, and general state-nation congruence. Critical to this author's conception of state strength is the extent to which the state functions for the betterment of all individuals living within its territory. Therefore, there are four basic areas that promote state-society strength: institutional capacity, economic growth capacity, emphasis on human development, and human security. As I will demonstrate, water security reinforces each of these areas, therefore providing a foundation to support state strength

(See Figure 1). In contrast water insecurity exaggerates the deficiencies present in fragile states and creates a possible breaking point.

First, institutional capacity represents a critical determinant of the functioning ability of a state. Institutional capacity includes the state institutions, such as ministries of education, justice, or finance, as well as contextual support provided to non-governmental organizations, and existing social norms and practices. Institutional capacity encompasses the ability of state institutions to establish and implement short, medium and long term plans, balance conflicting goals or demands, and adapt to unexpected events, particularly of large-scale. Moreover, institutional capacity enables the ease of governance and influences the direction of state development.

As Grey and Sadoff (2007) assert, water security requires functioning institutional capacity that allows state planners to identify need; determine optimal approaches to meet such need; allocate resources to desired projects; adjudicate disputes between users; and monitor infrastructure, water use and water quality. Therefore, water security entails the involvement of numerous departments and groups. Water insecure states often lack the institutional capacity to manage the state's water needs, or to adequately handle difficult hydrologic environments. While it may not always be the case, it can be argued that a state's deficient capacity to address its water security needs reflects an overall deficiency in institutional capacity.

Second, state strength is bolstered by its economic strength and capacity for growth. This includes the level of development and extent to which it is integrated into the global economy. In addition, economic strength necessitates sound policy making

and political will. A state's economic growth capacity is further reinforced by its level of infrastructure, its ability to collect revenues and allocate national assets, and the level and utilization of human capital. Water security directly benefits a state's economic strength, as water represents a critical input into most agricultural and industrial activity. In addition, water security supports the advancement of human capital by ensuring that individuals have access to clean water, promoting health and productivity. As with institutional capacity, water security requires a certain level of infrastructure, which likely denotes that the state has invested in other forms of infrastructure, such as roads or utilities. In addition, water infrastructure is generally developed with the intention of harnessing the power of water for hydroelectric energy or to increase agricultural productivity. Therefore, water security serves as a critical driver of economic development.

Third, water security supports the responsibility of the state to ensure the security and foster the welfare of the individuals living within their boundaries. Strong states exhibit the capacity and the political will to advance such a goal, which is manifest in the level of human development and the extent to which funding and policies are dedicated to the areas of education, health, and poverty alleviation. The literature on development-security nexus clarifies the importance of promoting a virtuous cycle of human development/human security/state-society strength. Ensuring water security, particularly ensuring the basic water needs of individuals, advances human development and promotes human security, because access to water is directly linked to improved health and improved livelihoods. Water security for human well-being has been linked to the

achievement of the Millennium Development Goals, by assisting in the alleviation of poverty, improving nutrition outcomes, improving maternal health, and increasing the number of female children in the education system (Palaniappan, 2009). Water security further supports food security and ensures a livelihood for millions of people who depend on agriculture or fishery. In recent years, increases in food prices or concerns with food shortages have led to riotous civil unrest in places like India, Tunisia and Haiti, and concern has been raised that intensifying water shortages will result in higher food prices and more frequent food riots. Water security clearly supports foundational elements that promote state strength and ensure human well-being.

The implications of water insecurity in states with limited state capacity, legitimacy and authority are manifold. Water insecurity denotes the lack of institutions and infrastructure to support development and functional governance. Water insecurity impedes growth capacity, negatively impacts agricultural productivity, and creates a massive drain on the productivity potential of individuals. Lack of access to clean water causes unnecessary illness and fatalities, and the collection of water consumes large portions of women's productive hours and keeps girls out of school. Therefore water insecurity aggravates gender inequality and heightens the experience of human insecurity overall. Moreover, as Homer-Dixon and Kahl assert, water insecurity, particularly water scarcity, increases the sense of competition between groups and creates incentives to challenge the state's authority. As the capacity gap between what is demanded of the state in terms of meeting competing water needs and what the state is able to achieve expands, domestic legitimacy erodes and state authority becomes more tenuous. Water

insecurity can create a negative cycle in which fragile and failing states are unable to cope with the multiple and competing demands.

To demonstrate the relationship between water insecurity and state failure, the situation of Pakistan will be analyzed. Pakistan is one of the world's most water stressed states, and has also been listed on several state failure indexes for over five years. Unlike most failed or failing states, Pakistan does exhibit many functioning institutions, particularly its military. However, Pakistan can be described as one of the most insecure security states, because its emphasis on military build-up in opposition to India has been to the detriment of all other critical areas of state strength. Pakistan's water crisis will place significant demands on the institutional capacity of the state in the next 10 to 20 years, and has the potential of significantly depressing Pakistan's development potential for the long-term.

CHAPTER 4

CASE OF PAKISTAN

Up to this point, the discussion has focused broadly on operationally defining water security from a state security perspective and from a human security perspective, discussing the security-development nexus, and outlining the indicative factors underlying state failure. These indicators include the effectiveness of governance particularly in state authority, legitimacy and capacity; the type of regime and openness of democracy; the level of groupness or state-nation congruence; level of economic growth; the extent of uneven development and structural imbalances; and the level of human insecurity. Additionally, it was proffered that water security underpins and reinforces many of the foundational factors that promote state strength. A conceptual analysis was presented that outlined the extent to which water security promotes economic growth, the development of institutional capacity and infrastructure, and human security and development. The task now is to demonstrate how these phenomena interrelate, and to more deeply explore the implications of water security issues on states that are considered at risk of failure.

Because of its tumultuous socio-political history and its designation as a significantly water-stressed country, Pakistan proffers an illustrative example for exploring the potential for water insecurity to act as a risk factor of failure. Pakistan

presents a contradiction in regards to the issue of water security and state strength because at a surface level, the country has an extensive institutional structure and many of the features that would imply a functional state. However, a deeper analysis of the country's political development and current political, social and environmental issues signify that Pakistan is highly unstable and faces significant challenges to its internal security.

For much of the past decade, arguments have been raised as to whether or not Pakistan has failed all together as a state (Jan, 1999; Kumar, 2005; Qureshi, 2005; Rotberg, 2010; Singh and Kukreja, 2005). Analysis of Pakistan's political and societal development presents a state that has demonstrated persistent political instability and a history of authoritarian rule (Husain, 2009; Kukreja, 2005; Talbot, 2009), excessive militarization to the point of being a garrison state (Kukreja, 2005; Siddiqa, 2005; Talbot, 2009; Waseem, 2005; Ziring 2010), ethnic tension and factionalism (Jan, 1999; Malik, 1996; Talbot, 2009), overt and tacit support for Islamic extremism and terrorist activity (Jan, 1999; Singh and Kukreja, 2005; Siddiqa, 2009; Ziring, 2010), and limited institutional capacity and political culture due to preference for patronage and personal gains (Malik, 1996; Talbot, 2009; Wilder, 2009). For such faults, Pakistan consistently ranks among the top 10-20 failed states by the various failure indexes (e.g. Failed State Index, CIPF). However, some scholars argue that Pakistan is not yet failed, though has balanced precariously on the precipice for over 60 years (Malik, 1996, 2008; Qureshi, 2005). Arguments against Pakistan's failure concentrate on its military power (Qureshi, 2005) or on a hopeful expectation that Pakistan will overcome its myriad of challenges

(Malik, 1996). Regardless of whether Pakistan has failed, is failing or is perpetually weak, Pakistan remains one of the most underdeveloped countries in Asia.

In addition to its political and social challenges, Pakistan is one of the most water-stressed countries in the world (World Bank, 2005), as Pakistan withdraws over 40% of renewable water sources each year (FAO, Water at a Glance). Pakistan's economy is heavily reliant on agriculture, and the country boasts one of the most extensive irrigation systems in the world. However, inefficiency and misuse, combined with anticipated climatic changes and rapid population growth, creates an uncertain water future for Pakistan that threatens the functional capacity and legitimacy of the state. The discussion below will concentrate on the major political, economic and societal features of Pakistan that provide an assessment of the state-society strength. In addition, a review of Pakistan's water security issues will be presented.

Pakistan on the Precipice: Political Factors

Political development in Pakistan has been marred by instability, inconsistency and contradictions. Over the 64 years as a sovereign state, the country has witnessed over 33 years of military rule under four leaders, fourteen Prime Ministers, five interim governments, and the institution of four formal constitutions (Burki, 1999; Husain, 2009; Talbot, 2009). Illustratively, the average tenure for elected civilian government is estimated to be less than two years (Husain, 2009), which creates a political environment where the focus is on "short-term political (and financial) gain rather than on achieving mid-to longer-term policy objectives (Wilder, 2009:28). Moreover, the transition from

one government to the next was seldom smooth, adding to the experience of instability (Husain, 2009; Kukreja, 2005). Political, social and economic policies rarely remained in force beyond the tenure of government (Husain, 2009), resulting in an erratic national development.

The Political Instability Task Force notes that inconsistency in regime type breeds instability (Bates et al., 2003), which accurately describes the political history of Pakistan. According to the Political Instability Task Force's analyses of political instability, weak democracies and weak autocracies are most at risk for political instability and potential failure (Bates et al., 2003). Pakistan's governance structure can be characterized as both. According to its founding documents, Pakistan is a democratic Islamic state, served by a parliament and headed by a president. However, the development and exercise of open democratic institutions has been severely limited from the beginning (Burki, 1999; Saif, 2010; Singh and Kukreja, 2005; Talbot, 2009). Historian Stephen Cohen (2004) notes that most of the politically powerful stakeholders, including the leaders of the Muslim League, perceived democracy as an attractive idea in the abstract, but its practice was deemed to have unsavory consequences for the distribution of political and economic power. At the country's birth, Muhammed Jinnah declared himself the Governor-General of the new state of Pakistan, and personally selected his prime minister and other members of government from members of his elite Muslim League (Burki, 1999; Mahmood, 2000). This tradition of indirectly electing or appointing the highest positions of power, the President and the Prime Minister, continues in the current Pakistan government (Burki, 1999; Mahmood, 2000).

Moreover, most of the governments, whether military or civilian, have assumed authoritarian stances once in power, significantly limiting the ability of Parliament to interfere with the executive authority (Husain, 2009; Singh and Kukreja, 2005; Wilder, 2009). Constitutions have been redrafted or drastically amended to increase the executive powers of either the President or the Prime Minister, and limiting the functional capacity of the National Assembly and Senate (Burki, 1999; Mahmood, 2000). These tendencies reflect Political Instability Task Force's analysis that weak partial democracies marked by a dominant executive power with few checks authority and political factionalism, are significantly more likely to experience political instability than full democracies and even full authoritarian regimes (Bates et al., 2003).

The penchant for authoritarian, elitist rule derives from Pakistan's colonial heritage (Saif, 2010; Singh and Kukreja, 2005; Talbot, 2009). The British annexed the northwestern tribal areas and princely states late in their colonial enterprise on the Indian subcontinent (Talbot, 2009). These areas served primarily as a strategic buffer between British India and the encroaching Russians, Persians and Afghans (Talbot, 2009). Rather than fully establishing the colonial apparatus that was operating in Eastern Punjab and Bengal, the British maintained minimal administrative presence but incentivized loyalty and compliance among the various tribal leaders by bestowing land grants, titles and other favors (Saif, 2010; Wilder, 2009). This system was ardently pursued in northwestern Punjab, which the British favored because of its proximity to the established British India, and because of presumptions among the British that the Punjabi people exhibited military prowess and compliant attitudes (Saif, 2010; Talbot, 2009).

Lubna Saif, who presents a highly critical analysis of the colonial experience on the subcontinent, notes that "western Punjab played the most vital role in strengthening colonial rule", thereby "attaining the status of the 'Sword Arm of the Raj'" (Saif, 2010:15). The association between special dispensation and the colonial army created a dominant landed aristocracy in Punjab that assisted the British in maintaining law and order throughout the northwestern areas (Saif, 2010; Talbot, 2009). As Talbot and others explain, the system of patronage in exchange for loyalty among landed elites "discouraged the introduction of representative institutions in the Punjab" (2009:63) and created a detrimental imbalance between weak democratic institutions and an excessive bureaucratic system (Wilder, 2009).

The most influential bureaucratic institution in Pakistan remains the military, which has entrenched itself in the political development of the state (Kukreja, 2005; Saif, 2010; Ziring, 2010). Since Pakistan's birth, the military establishment of Pakistan has viewed itself as the ultimate defender of Pakistan's national integrity, and the "benevolent babysitter, watching over Pakistani politics and society" (Cohen, 2004: 61). This attitude has led to the excessive militarization of Pakistan, which represents a fundamental paradox between Pakistan's strength and weakness. For some, the strength of the military props up the state's authority and capacity, leading some to question the applicability of "state failure" to Pakistan (Qureshi, 2005). However, as will be explained in more detail below, Pakistan's emphasis on the military has been at the expense of other areas of national development (Kukreja, 2005), and in effect makes Pakistan the epitome of an insecure security state. Lawrence Ziring (2010) classifies

Pakistan as a garrison state, and notes that heavy reliance on the military is a sign of weakness rather than strength. The military has been a destabilizing force through the thirty years of direct military rule and its influential role during periods of civilian government (Burki, 1999; Wilder, 2009). Moreover, as a carry-over from the colonial system, the military cultivates the patronage system as a means of maintaining and expanding their influence (Wilder, 2009). Thus, the military's influence in Pakistan's political system has stifled the possibility for true democratic development.

The extensiveness of political instability and the influential role of the military in politics raise doubts regarding state authority, legitimacy and capacity in Pakistan. According to the Country Indicators for Foreign Policy, state authority incorporates both the traditional concept of monopoly of legitimate use of force, as well as the ability of the state to govern its entire population. While the strength of the Pakistani military implies a strong monopoly on legitimate use of force, the ability of the state to govern its territory and provide safety for its entire population is questionable, particularly since Pakistan's involvement in the US war on terror (Rotberg, 2010). Over the 60 years of its sovereignty, Pakistan has had minimal authority in the frontier regions of the Northwest Frontier Province (now Khyber Pakhtunkhwa) and Baluchistan, in part a legacy of the administrative structure established by the British during the colonial experience (Burki, 1999; Talbot, 2009; Weinbaum, 2009). Related, the limited authority in the frontier areas of Baluchistan, Khyber Pakhtunkhwa, and the Federally Administered Tribal areas derives from the high level of state-nation incongruence and the revisionist desires of the groups within these regions (Miller, 2010). The authority of the state has already been

successfully challenged by the Bengalis during the 1965-71 civil war, which ended with a smaller state of Pakistan and a new Bangladesh. The state's authority continues to be questioned by insurgent groups in Baluchistan, and among the Pashtuns in the Khyber Pakhtunkhwa (Miller, 2010).

In addition, the state's ability to control its borders and protect its polity from home-grown terrorism has been significantly frustrated, despite the fact that Pakistan possesses one of the largest armies in the world, particularly for its size. Since 2001, the incidence of terrorist activity has risen drastically (Nayar, 2009; Shafquat, 2009; Siddiqa, 2009; Weinbaum, 2009). Baldev Raj Nayar, reporting on level of insecurity in South Asia, asserts that, with 2,293 terrorism-related deaths, Pakistan ranked second in the world according to the US Counterterrorism Center's 2008 Report on Terrorism, behind Iraq (Nayar, 2010). Moreover, while extremist activity and the development of Islamist-extremist/terrorist groups have previously concentrated in the northwest borders with Afghanistan, such activity is encroaching into the more populous provinces and into the major cities (Siddiqa, 2009). The inability of the military in restraining terrorist activities reflects a conundrum within the institution regarding the identity of Pakistan as a Muslim state (Siddiqa, 2009). Because the origins of Pakistan were devised as a Muslim state independent from a Hindu India, and because of the unfinished task of defining territorial borders in Kashmir, the military has both tacitly and directly supported the development of Islamic extremist/terrorist organizations that would undermine the authority and regional power of its easterly neighbor (Siddiqa, 2009). Islamist extremist groups have not been considered a threat to state security (Weinbaum, 2009). However, this implicit

policy has had significant negative consequences for the security and stability of Pakistan (Siddiqa, 2009; Weinbaum, 2009).

Numerous factors challenge the legitimacy of the Pakistan state, which the Country Indicators for Foreign Policy defines as "the ability of the state to command public loyalty to the governing regime and to generate domestic support for government legislation being passed and policies being implemented" (CIFP Fragile State Methodology). Among these factors are the extent to which the military establishment is entrenched in national and foreign policy; the extent of state-nation incongruence and the level of resentment among smaller ethnic groups toward the Punjab majority; and the inability of the state to curb corruption and parochial politics. Lacking truly democratic institutions, the governments throughout Pakistan's history, particularly those headed by military dictators, have manipulated domestic support to legitimize their rule (Husain, 2009; Mahmood, 2000). In many cases, regimes relied on their elitist political bases, particularly Punjabi aristocracy and the muhajir population, to legitimize their authority. For example, General Muhammad Ayub Khan, who declared himself President on October 27, 1958, significantly restricted the potential for political participation among the general population by establishing the selective Basic Democracy, through which the President and government officials were elected (Mahmood, 2000). This system disconnected people from political affairs and intensified the practice of bribery and patronage (Mahmood, 2000). The façade of democracy has also been poorly utilized to legitimate other non-elected political leaders. President Musharraf manipulated elections in 2002 to legitimize the presidency he usurped several years prior and to hamper his

oppositions' political power (Cohen, 2004). Political leaders also relied heavily on the appeal of Islam and Pakistan's opposition to Indian hegemony as a means of garnering popular support (Husain, 2009).

As with its questionable authority, the legitimacy of the Pakistani state has been tested by the high-level of groupness, and the resentment among the smaller ethnic groups toward the majority Punjabis. Historically, the central government has been either unable or unwilling to fully integrate the tribal areas of Pakistan into political culture and society (Weinbaum, 2009), and has allowed considerable unevenness in the level of development between the Punjab and Sindh heartland and the peripheral regions (Fund for Peace, Pakistan Assessment). In addition, Punjabis have dominated the critical institutions of the state, including the military and civil bureaucracies (Wilder, 2009). The combination of these features has significantly hindered the state's ability to develop a wide-spread affiliation to national identity, and has created a detrimental feeling of resentment among the various ethnic and provincial groups (Cohen, 2004; Saif, 2010; Wilder, 2009). The separation of West and East Pakistan in 1971 was not only a rejection among the Bengalis of Punjab-dominated government, but of the state's legitimacy. In addition, the state's legitimacy has been challenged by insurgent movements among the Baluchis, the Pashtuns, the muhajirs, and Sindhis (Cohen, 2004), not to mention the increasing rise of Islamic fundamentalist groups that adhere to a different set of moral authority (Weinbaum, 2009).

State capacity represents a critical characteristic of a state, as it refers to the ability of the state to carry out its essential duties as a state and to employ public

resources for bettering national development. Capacity encompasses the effectiveness of institutions (Lemma and Cummins, 2010), the availability of fiscal and human capital (Homer-Dixon, 1999), coherence between the various segments of government particularly regarding a policy agenda (Homer-Dixon, 1999), and the political will to enforce policies and foster open environments for development and growth (Lemma and Cummins, 2010). The status of state capacity in Pakistan presents a contradiction. The state possesses all of the requisite governmental institutions and an extensive bureaucratic structure, yet Pakistan's institutional effectiveness is markedly weak. According to the World Bank's Worldwide Governance Indicators, Pakistan ranked below the 20th percentile in governance effectiveness in 2009, and has historically ranked below the 50th percentile (World Bank). Corruption is wide-spread, and the predilection of politicians to use political office to expand personal prominence has been severely incapacitating. Moreover, the judiciary has limited independence from the influence of the executive (Cohen, 2004), and political space for civil society has been generally restrained (Bajoria, 2008; 2009). The inability of the government to adequately address the insurgent issue is one example of Pakistan's weakened capacity (CIFP, Democracy and Governance Report, 2007). The inaction of the government in the weeks and months following the devastating floods in July 2010 further underscores the ineffectiveness of the government to effectively support the public welfare and security of the population (Carment and Samy, 2010).

Pakistan on the Precipice: Economic Factors

While the governance structures of Pakistan reveal critical weakness in the political stability of the country, Pakistan has maintained relatively robust economic growth throughout its young history (Husain, 2009). Since its birth, Pakistan has averaged an annual GDP growth rate of 5.4% (World Bank Dataset), though there is noticeable variation between years that appear to coincide with elected civilian governments or periods of transition. Former economic policymaker Ishrat Husain (2009) argues that Pakistan's relative economic success results from an overarching commitment across regimes to a liberal-economic approach, deviated only by Zulfikar Ali Bhutto in the 1970's. However, other scholars have contended that Pakistan's economic record hides the state's dependency on foreign aid, and have criticized the state's unwillingness to implement authentic economic reform, including a reduction of the military in government expenditures or land reform (Cohen, 2004; Kukreja, 2005; Siddiqa, 2005). Moreover, while the country has witnessed overall economic growth, the benefits of such growth have not been distributed evenly across the provinces, resulting in continually stunted human development. Therefore, to measure the strength of Pakistan on its average annual growth rate provides an incomplete assessment of the economic factors that relate to state strength.

Historically, Pakistan's economy has been dominated by the agricultural sector, though the service sector and the industrial sector are now surpassing agriculture's contribution to the GDP; in 2010, agriculture accounted for 22% of the GDP, while industry and service accounted for 24% and 55%, respectively (CIA Factbook).

Agriculture still comprises the largest portion of the labor force, directly involving approximately 45% of the labor force, and engaging millions more who depend on subsistence agriculture for their livelihoods (Farooq, 2010). Moreover, because much of Pakistan's industrial sector focuses on processing agricultural products, agriculture indirectly sustains a far larger segment of the labor market than official numbers relate (Farooq, 2010; World Bank, 2005). For example, the textile industry accounts for nearly half of Pakistan's manufacturing and over $4US billion in export revenue (Cohen, 2004). Critics have argued that the political instability in Pakistan has disabled the country to adequately develop the industrial base and human capital to be competitive in the global market (Cohen, 2004; Kukreja, 2005).

Pakistan's economy has been significantly bolstered by the influx of foreign aid and investment. Since the beginning of the Cold War, Pakistan has utilized its strategic geographic position on the Asian continent as leverage to obtain financial and military aid from the United States and its Western allies (Cohen, 2004; Husain, 2009; Kukreja, 2005). In 1954 and 1955, Pakistan joined the South East Asia Treaty Organization (SEATO) and the Baghdad Pact (later CENTO), both of which supplied Pakistan with substantial financial aid and military arms (Ziring, 2010). The US War on Terror has benefitted the Pakistan economy tremendously, as Pakistan's alliance with the US was accompanied by debt forgiveness and large inflows of foreign direct investment (Nayar, 2010). By some estimates, FDI equaled over one billion US dollars in 2004 (Razmi, 2009). Nayar explains that Pakistan's growth reflects geopolitics rather than globalization (2010:110).

However, analysts criticize Pakistan's ill-use of such income (Kukreja; 2005; Nayar, 2010; Siddiqa, 2005), noting that the reliance on foreign aid in particular has produced several damaging consequences for the economy. First, as most of the aid came in the form of financial loans, Pakistan has incurred massive amounts of debt, which its low tax-base has been unable to balance. In the early 1990's, Pakistan's foreign debt was reported to be US$38 billion (Kukreja, 2005), while currently external debt equaled over US$50 billion in 2010 (Pakistan Ministry of Finance). Debt servicing has represented a significant portion of the federal revenue expenditure. In the late 1990's, debt servicing amounted to 78% of tax revenues (Kukreja, 2005); in the 2010 total public debt represented over four times total government revenues and 60% of GDP (Pakistan Ministry of Finance). Pakistan's debt load has sometimes required additional loans to assist in debt repayments (Cohen, 2004; Kukreja, 2005). A second consequence pertains to limited economic policy planning and an unwillingness to commit to necessary economic reforms (Cohen, 2004; Kukreja, 2005). The availability of easy money lessened the importance of developing a self-reliant economy. Only when lenders required specific conditions for additional loans were political leaders willing to consider mid-term planning that involved privatization and deregulation (Cohen, 2004). Moreover, critics emphasize that nearly all regimes have hesitated in enacting significant economic reform that would improve the structural imbalances between classes, increase the potential of the state to collect revenues, and improve Pakistan's level of development (Cohen, 2004; Kukreja, 2005).

The two most significant reforms that have been neglected by every regime include land reform and military spending (Cohen, 2004; Khan, 2009; Kukreja, 2005; Siddiqa, 2005). The colonial policies of bestowing land grants and titles to tribal leaders and loyal military officials created a politically and economically dominant landed aristocracy that has staunchly clung to its power throughout Pakistan's development (Saif, 2010). Pakistan's political economy has been described as a feudal capitalist system (Cohen, 2004; Kamal, 2009; Kukreja, 2005; Saif, 2010), in which power is concentrated in the hands of a small group of landowners while the majority of the rural population is economically marginalized. While India and other South Asian nations enforced significant reforms to redistribute land ownership after the departure of the British, the politically entrenched landowners prevented similar measures from occurring within Pakistan (Kukreja, 2005). The landowning class has also stymied economic proposals to increase agricultural taxes or incur other revenue from the agricultural sector (Kukreja, 2005). Economist Feisal Khan (2009) notes that while an agricultural income tax would generate approximately US$750-875 million in additional revenue, the politically influential landed class consistently prevent such measures from passing in Parliament. The inability or unwillingness of the Pakistan government to enforce meaningful land reform underscores the state's incapacity to ensure the security and well-being of its entire populace. Moreover, persistent rural poverty and stunted economic development remain the outcomes of this significant structural imbalance in land ownership.

Throughout Pakistan's history, the military has played a central role in the political economy of the state, because of Pakistan's obsession with its easterly neighbor, India. Since inception, Pakistan has suspected India of seeking to undermine the sovereignty of Pakistan. Rather than assume a passive position, Pakistan's sense of insecurity and desire to weaken the regional power of India has resulted in an excessive buildup of military power. In addition to expanding its conventional military capacity to "match" the strength of India, Pakistan has ardently pursued its nuclear capacity (Siddiqa, 2005), a costly mission. The military defense budget represents over 5% of government expenditures, though Ayesha Siddiqa (2005) notes that actual expenditures dedicated to the military enterprise is not disclosed and represents more than the "one-line figure in the national budget" (126). Moreover, while Husain (2009) argues that the strength of the economy has much to do with the strength and independence of the private sector, Siddiqa (2005) contends that the military has created a monopoly in the private sector, in which the army controls much of the major industries in the country, including financial, insurance, construction and manufacturing.

The allocation of government revenues to the maintenance and expansion of Pakistan's military capacity, competing with India, has come at the expense of Pakistan's overall economic and human development. Siddiqa (2005) reports that, between 1981-1999, Pakistan dedicated an average of 0.75% of GDP to health, 2.13% to education, and 6.5% to defense. Similarly, Cohen (2004) indicates that in 2003, defense expenditures represented 55% of the national budget, compared to 36% allocated to developmental expenditures. While Pakistan has been so consumed with its power struggle with India, it

has failed to achieve much of the social and economic gains that allow its neighbor to maintain regional dominance. Pakistan ranks as a middle-income country according to the UNDP Human Development Reports, 134th out of 177, not far behind India, which ranks 126th. However, India has prioritized human development to a greater extent than Pakistan, as noted by the size of government spending on education and public health (over 3.5% and 4.5% respectively) (Nayar, 2009). Pakistan's level of human development has remained relatively stagnant for decades. In 2004, approximately half of the adult population was literate, three-fourths of the population lived on less than $2/day, nearly a third were below the national poverty line, and there were 80 infant deaths/1000 live births (Watkins, 2006). While GDP/capita has been steadily increasing since 1990, averaging approximately US$550, critics argue that the economic growth has not been distributed to the poor, but rather stays within the hands of the landlords and industrial class (Kukreja, 2005; Siddiqa, 2005).

Critical to the health of a state's economy is the extent to which the state develops the productive potential of its population, including education and job opportunities. Education indicators denote limited priority on developing a literate and educated workforce. According to the Human Development Report data, literacy for the individuals over the age of 15 is approximately 50%, though this is skewed by the higher literacy rate among those between the ages of 15-24 which is 66% (Watkins, 2006). In 2004, only two-thirds of school-aged children were enrolled in primary school, and attrition by grade 5 was approximately 30% (Watkins, 2006). Education opportunities for females remain dismal, as demonstrated by comparatively lower literacy rates (36%

vs. 63%) and lower enrollment rates in school (32% vs. 44%) (Watkins, 2006). As noted, public investment in education averages approximately 2% of government expenditures, and Pakistan has relied heavily on foreign investment for schools, particularly from other Muslim countries (Paul, 2010; Ziring, 2010). The result of the low investment in and management of the education system is "generation after generation if ill-trained and barely literate young men" with very few job prospects and "millions of young girls who do not receive any serious education, and …are excluded from the formal workforce" (Cohen, 2004: 241).

As noted, some analysts assert that Pakistan has wasted opportunities to create a truly robust industrial economy, instead concentrating efforts on the military establishment. While Pakistan's official unemployment numbers, at 5.5%, represent typical employment levels for most developing and developed countries (Nizami, 2010), it undercounts large portions of the population that are either excluded from the labor market or who participate in the informal economy. Given the heavy reliance on foreign aid, Pakistan's economic development has been stifled much like its political development. Moreover, it signifies critical weaknesses in the state's capacity to establish and maintain viable economic policy.

Pakistan on the Precipice: Societal Factors

Pakistan faces several significant demographic and societal challenges, including an expanding population, a growing youth bulge, increasing urbanization, and intense inter-group factionalism. These challenges are magnified by the problems of a low

emphasis on human development. As of 2010, Pakistan's population was estimated to be about 173.5 million people, an increase of 10.6 million people since 2007 (Nizami, 2010). Population growth estimates for Pakistan suggest that by 2050, the country will have approximately 300 million people (Nizami, 2010). The increase in population is a combination of the persistently high fertility rate and the improvements in health indicators that decrease the number of child deaths and prolong adult life (Nizami, 2010). For various cultural reasons, Pakistan's fertility rate has remained above 4%, the highest in the South Asian region (Nizami, 2010). Cohen (2004) implies that the high fertility rate reflects an implicit belief among the political elite that a large Muslim population provides a strategic asset against the state's national enemy, India. Concomitant with the expanding population, Pakistan's demographic distribution is weighing heavily towards the youth bracket. The recent Economic Survey of Pakistan reports that the median age of the population is 20, with 104 million people below the age of 30 (Nizami, 2010). Such a large proportion of young people presents numerous demands on federal and provincial governments, particularly in terms of education and employment. While unemployment for those between the ages of 25-34 is only slightly above the national unemployment rate, 6.9%, over 17% of youth between the ages of 15-24 are unemployed (Nizami, 2010). In the absence of quality education, training and productive opportunities, many of these youth become prime recruits for extremist groups (Cohen, 2004; Weinbaum, 2009).

Urbanization is also creating challenges for Pakistan's capacity. While the majority of the population continues to reside in rural areas, Pakistan's cities are growing

exponentially, due to the prospects of better employment. For example, the port city of Karachi grew by 43% between 1998 and 2010, and Islamabad expanded by 84% to a population of 972,669 (Nizami, 2010). Interestingly, the cities in the more desolate provinces, such as Quetta in Baluchistan, and Peshawar in NWFP, have also seen significant growth over 40% (Nizami, 2010). Like in most developing countries, urbanization is occurring at a rate faster than public planning can manage, challenging the state's capacity to provide sufficient housing and straining public municipal services.

The final critical societal factor challenging Pakistan's stability is the high level of groupness. As it has already been mentioned, Pakistan is characterized by high state-nation incongruence, due to the extensive ethnic diversity and the inability or unwillingness of the state to create an overarching bond to national identity. In explaining the increase in ethnic-based political violence during the 1990's, Jan (1999) notes that "ethnicity has been an underlying factor in Pakistani politics since the country's creation" (703). Many of the 90 plus political parties in Pakistan are organized along ethnic/regional lines. Moreover, the exclusivist politics among the Punjab majority exaggerates the state-nation incongruence. In addition to the ethnic factionalism and the noted revisionist desires among several ethnic minorities, groupness in Pakistan also occurs along sectarian lines. While the rise in Islamic extremism has much to do with Pakistan's involvement in the War on Terror, the domestic terrorist activity also reflects increasing animosities between Sunnis and Shiite (Jan, 1999; Miller, 2010). Siddiqa (2009) notes that there has been an increase in the number and size of Islamist extremist groups operating in Pakistan since the 1980's, many of which are motivated by strong

religious ideology. Thus, while the ethnic factionalism has lead to insurgent movements against the state, sectarian animosities incite interpersonal violence.

Assessing State Strength in Pakistan

Pakistan clearly exhibits problematic features that place it at risk of state failure. Politically, the Pakistan state predominantly operates as an elitist authoritarian regime that at times dons a veneer of democracy. The extent of political instability within the state and the dominant role played by the military has undermined the state's ability to establish a viable democratic state. In addition, Pakistan has been inconsistent in demonstrating the core characteristics of stateness – authority, legitimacy and capacity. While the state maintains a strong military force that denotes authority and legitimate use of force, the persistence of terrorist and insurgent groups in the country's frontier raise questions regarding the state's reach. Ethnic based politics have further weakened the sense of state-nation congruence, and undermines the state's domestic legitimacy. Pakistan's erratic governance capacity underscores the extent to which state strength in Pakistan is a façade. The inability of the state to rein in the extremist Islamic groups has attracted much attention internationally, and represents a primary reason as to why Pakistan has been identified as a failing state.

Economically, Pakistan presents some qualities of strength. However, Pakistan's record of economic growth primarily reflects a heavy reliance on international aid and FDI. Pakistan's political economy promotes military investment over investment in economic and human development Pakistan's feudal structure and persistent inequalities

between the economic classes signifies another risk factor that continues to tip the balance toward failure. In addition, the low prioritization on human development, and the rise of extremist Islamic groups has created an environment of high human insecurity.

Considering these problems, the question remains as to whether or not Pakistan is a failed state. Scholars and policy makers present divergent opinions on this matter. Some analysts argue that Pakistan failed in 1971 when East Pakistan seceded from West Pakistan (Kumar, 2005). Others point to the history of political instability and the inability of the state to truly establish its authority and legitimacy over the entire territory as illustrations of Pakistan's continual state of failure (Rotberg, 2010). The major indices of failure and instability rank Pakistan at significant risk of failure. The Country Indicators for Foreign Policy provides a dismal assessment of Pakistan in which the state's heavy militarization and weak governance capacity are clear indicators of state fragility and possible failure (Direh, Marchylo, Urban and Wyszomierska, 2007). The Fund for Peace Failed State Index places Pakistan 10th in 2010, primarily because of the serious political, social and economic stress caused by high levels of ethnic factionalism, the excessive involvement of military in politics, and lack of domestic legitimacy (Fund for Peace).

However, although Pakistan demonstrates signs of failure, some argue that Pakistan is not a failing state, because the strength of the military ensures that the state carries out its primary duty of providing security (Qureshi, 2005). Qureshi (2005) argues that the state institutions in Pakistan have not failed, but rather it is the ideology upon which Pakistan was formed that has failed. In addition, the argument has been made that

Pakistan has not yet failed and will not be allowed to fail because it is too strategically important to world powers (Kumar, 2005). The international community is particularly concerned that Pakistan's nuclear weapons may be acquired by terrorist groups (Gupta, 2002). A failed Pakistan could have serious negative implications for the Central and South Asian regions, as well as for global security. Considering the breadth of evidence regarding Pakistan's uncertain state strength, Pakistan provides a clear example of a stifled state that has been on the precipice of failure since its inception.

Pakistan's Water Security Conundrum

The weaknesses and contradictions manifest in Pakistan's political, societal and economic structures become even more salient when examining their water security status. Water security has been defined as possessing adequate amounts of quality appropriate water to meet current and future need requirements, in a manner that sustainably supports ecosystems. As Grey and Sadoff (2007) have asserted, water security requires a base level of infrastructure and institutional capacity to plan for and meet water needs, and to adapt to potential water-related disasters. The ability of a country to obtain water security is highly dependent upon its environmental context, or what Grey and Sadoff (2007) call the hydrologic legacy. Using these definitional criteria, Pakistan possesses a tenuous level of water security. Being an arid to semi-arid country that is primarily dependent on one major river system, Pakistan already experiences challenges in meeting current water needs (Kamal, 2009; Kugelman, 2009; World Bank, 2005). In addition, Pakistan's infrastructure is antiquated and inefficient, leading to

massive wastage (Kamal, 2009). Little oversight exists to protect against industrial degradation of water quality (Kugelman, 2009). As recent flooding events demonstrate, Pakistan's government has been ill-equipped to respond to major water-related events, resulting in extreme water insecurity for the population. Finally, though the Indus Water Treaty stands as an exemplar of international water cooperation, hydropolitics persist as an undercurrent theme in the tensions between Pakistan and its upstream neighbor. Given Pakistan's propensity to externalize security issues, Pakistan has historically blamed its water challenges on India.

In this section, the extent to which Pakistan faces water insecurity will be outlined. First, I will describe how Pakistan's challenging hydrologic environment impacts the country's water security. This will include a discussion of inefficiencies of Pakistan's water infrastructure. Second, I will present Pakistan's external water security concerns, namely Pakistan's relationship with India and the Indus Waters Treaty. Third, I will discuss the internal issues caused by water insecurity, including the interprovincial tensions over water allocation. Finally, I will focus on the human water insecurity that is pervasive in Pakistan.

Ensuring Water Security in Pakistan's Challenging Hydrologic Environment

Pakistan possesses a complex and difficult hydrologic environment, with significant climatic and geographic differences across its major regions. The northern areas of Pakistan have some of world's tallest mountains, where the headwaters of the subcontinent's rivers originate (FAO, 2010; Malik, 2008). Baluchistan and parts of

Sindh in the south and southwest of the country are extremely arid, exhibiting different desert environments (FAO, 2010). Punjab and the remaining parts of Sindh have benefitted from the Indus River system, which creates an extensive watershed throughout these provinces. Overall, Pakistan has an arid or semi-arid climate, averaging between 240mm (World Bank, 2005) to 494 mm of rainfall per year (FAO, 2010), though the country experiences large seasonal and geographic variations in precipitation and temperatures (FAO, 2010). The desert areas of Baluchistan and Sindh receive less than 100 mm/year; while North West Frontier Province and northern Punjab average approximately 1500mm of rainfall each year. The winter season is typically drier than the summer months, when monsoons bring most of the annual rainfall, and when the glacial melts fill the river systems. April through September, Pakistan experiences high temperatures (averaging 38 degrees Celsius), which increases the pace of evapotranspiration from crops (FAO, 2010). In addition, the torrential nature of the summer rains limits the rate of natural recharge because the gritty soil cannot absorb the deluge.

The Indus River serves as Pakistan's most extensive water source, running approximately 2,000 miles from the north-west corner of India through the entire length of Pakistan before draining into the Arabian Sea in Sindh. The Indus River system comprises five major rivers (the Indus, Jhelum, Chenab, Beas and Sutlej) which originate in the Himalayan regions of India and China, and is also fed by the Kabul River, which flows out of Afghanistan. The entire river basin covers a massive area of 1,138,800 km^2, of which 597,700 km^2 is situated in Pakistan (Gleick, 2009). Within Pakistan, annual

flows of the Indus River system equal between 138 to142 million acre feet (MAF) (Farooq, 2010; PILdat, 2003). In addition, the Indus Basin contributes to an extensive groundwater aquifer, which covers over 16 million hectares (FAO, 2010). Overall, Pakistan's total annual renewable water resources are estimated to amount to 233.8 km^3 (Gleick, 2009).

Estimates for annual water withdrawals indicate an increasing trend in the amount of water withdrawn in Pakistan, primarily for agricultural use. In 1991, total freshwater withdrawals were estimated to be 155.6 km^3, of which 1,991m^3 was dedicated for agricultural use (Gleick, 1998). In 2000, total water withdrawals were estimated to be 169.38 km^3, again dominated by agriculture, which used 1,043m^3 (Gleick, 2004). The national estimate for water withdrawals in 2008 was 183.4km^3(FAO, 2010), representing approximately 78% of total water resources. Given Pakistan's rising population, water availability at a per capita rate demonstrates a similarly alarming trend. In 1951, with a population of 34 million, Pakistan's per capita water availability was well over 5,200m^3/year (Farooq, 2010). By 1991, Pakistan's per capita water availability was estimated to be 1,565m^3/p/year (Farooq, 2010), below the benchmark level of 1,700m^3/p/year proposed by Malin Falkenmark for measuring water stress. By 2000, per capita water availability dropped to 1,072m^3 (Gleick, 2008), and estimates for 2010 suggest that per capita water availability averages 1,066m^3 (Farooq, 2010), indicating that Pakistan has become a highly water stressed country.

Given the limits of its natural water resources, Pakistan has relied on the development of water infrastructure for storage and dispersion. Pakistan possesses one of

the most extensive contiguous canal-irrigation systems in the world, much of which it inherited from the British colonial system. According the 2009-2010 Economic Survey of Pakistan, the irrigation system covers 42 million acres, and is comprised of three reservoirs (Tarbela, Mangla, and Chashma), 19 barrages, 12 inter-river linkage canals, 45 independent canal systems, and 110,000 water courses (Farooq, 2010). In addition, the system utilizes over 42MAF of groundwater that is accessed through 921,229 tubewells (Farooq, 2010). The combined total storage capacity of the three reservoirs equals 18.37 MAF (Farooq, 2010). In addition these reservoirs provide 4,662 megawatts of hydroelectric power, serving as a major energy source for the country (ul-Mulk, 2009). The World Bank extols the unexpected beneficial impacts Pakistan's dams have had for the country's economy. In Pakistan's water assistance strategy (2005), the World Bank reported that the actual power and irrigation outcomes were 25% higher than the predicted levels. The report further notes that while increased productivity as a result of additional water resources represents a direct benefit of the infrastructure, the role of agriculture in the economy implies that the impact likely extended to other sectors that directly and indirectly support the agricultural sector (2005).

However, numerous scholars and politicians have highlighted the system's inefficiency. The storage capacity of the major dams equals approximately 30 days of runoff, compared to 900 days provided by the Colorado River dams (World Bank, 2005). In addition, due to a build-up of silt, this storage capacity has declined by at least 27%, which affects the flows, particularly during the winter season (Farooq, 2010; Kamal, 2009). Water loss throughout the canal system presents another problem, as

approximately two-thirds of the 114MAF of freshwater sources is lost due to seepage and evaporation (Kamal, 2009). Inundation-style irrigation has resulted in the dual problem of water-logging and salinity, both of which have hampered Pakistan's agricultural productivity (Bengali, 2009; Kamal, 2009; Khan, 2009). The recent Economic Survey of Pakistan notes that agricultural productivity is dismally low, at less than $0.1kg/m^3$ (Farooq, 2010). Kamal saliently points to the irony of the situation, noting that "Pakistan is using 97% of its allocated water resources to support one of the lowest productivities in the world per unit of water" (Kamal, 2009: 32).

Climate change threatens to exacerbate Pakistan's productivity per unit and its overall level of water security in at least three ways. First, climate change is anticipated to increase the area's aridity, lessening the overall annual precipitation rates (Farooq, 2010). Rising temperatures and declining rainfall will increase the rate of evapotranspiration, which will add to Pakistan's salinity problem. Decreases in precipitation will increase the water insecurity for those living in Baluchistan and Sindh. Second, while overall the subcontinent is expected to become hotter and drier, climate change is anticipated to bring more intense rainfall during the monsoon season, which will increase the potential for flooding (World Bank, 2005). Pakistan's dry, silty soil, combined with already close to surface water tables (due to irrigation process), make difficult the absorption of heavy rains (World Bank, 2005). Third, climate change already affects the rate of glacial melts, which is expected to intensify at a rapid rate (Cooley, 2009; World Bank, 2005). While initially increased glacial melting may amplify the amount of river flows, the long-term threat is an overall reduction in flows.

In addition, as the flooding in the summer of 2010 demonstrated, seasonal melts have the potential to overwhelm the absorption capacity of the rivers.

External Determinants of Water Insecurity

Pakistan clearly faces significant gaps between water demand and availability of supply, gaps which are projected to increase due to changes in the climate, expanding economic development, and natural population growth. However, the national discourse regarding Pakistan's water insecurity largely focuses outward, toward its upstream riparian rival. Until 1947, the Indus River, and the extensive irrigation system established by the British to create a prolific agricultural colony, was a single system within one territorial unit. In addition to the tenuous political and social problems created at Partition (Cohen, 2004; Talbot, 2009), the delineation of Pakistan out of the Indian subcontinent generated the massive challenge of dividing the waters. At Partition, Pakistan possessed the majority of the canal system; however, the river headwaters originated in the Himalayan Mountains in India and China (Alam, 2002; World Bank, 2005). The violent migrations and the defiance of the Raj to comply with Partition agreements (Cohen, 2004) instilled fear in Pakistan that India would attempt to upend the sovereignty of the new state by halting the flows of the rivers. Indeed, on April 1, 1948, less than a year after Partition, the provincial government in East Punjab stopped the flow of the Sutlej River, posing significant threat to West Punjab's winter and summer crop seasons (Alam, 2002). The contentious and precarious situation between the two states eventually led to multilateral negotiations, headed by the World Bank. After ten years of

negotiations, the Indus Waters Treaty (1960) determined the allocation of the Indus Basin rivers between the two countries. Based on economic development goals for each country, the treaty allocated primary control and use of the three western rivers, the Indus, the Jhelum and the Chenab, to Pakistan, while India had control and use of the Ravi, the Sutlej, and Beas (World Bank, 2005). In addition, the treaty concretized the principles of equity and minimal harm (World Bank, 2005) and established mechanisms for information sharing and dispute resolution (Delli Priscoli and Wolf, 2009).

Given that infrastructure and institutional capacity form the structural basis for establishing water security (Grey and Sadoff, 2007), the Indus Waters Treaty process produced several important outcomes for Pakistan's water security. First, the division of the colonial irrigation system forced Pakistan to rapidly develop its own infrastructure for storage and regulation of the rivers' flows. The Tarbela and the Mangla Dams are the direct result of the dividing of the Indus Rivers. As noted, the benefits from these dams exceeded the expected projections of agricultural productivity and hydroelectric output (World Bank, 2005). In addition to the dams, the treaty made provisions for link canals, barrages and tubewells that would increase Pakistan's ability to access and manage its water resources (Delli Priscoli and Wolf, 2009). Second, the negotiation process induced the establishment of institutional capacity for managing the country's water needs. The Water and Power Development Authority was established in 1959 for the purpose of planning and implementing water resource development projects at the national and provincial level (Khan, 2009). The treaty further promoted the development of institutional capacity by requiring Pakistan and India to share information regarding

development plans and water quality and to annually assess the stability of the agreements (Delli Priscoli and Wolf, 2009).

The Indus Waters Treaty has been touted as hugely successful for transboundary water negotiations, and provides validation for the assertion that countries do not go to war over water (Wolf, 2004). Although Pakistan and India have engaged in small-scale wars, particularly over territorial disputes in Kashmir, water access and allocation have not been a declared objective of these hostilities. However, the IWT has not allayed the suspicions held by Pakistanis that India is "stealing [their] water" (Buncombe and Waraich, 2009). Since the 1960's, Pakistan has been wary of India's use of the Indus waters, blaming India's alleged noncompliance to the treaty as the cause of their water problems. An article in the Asian edition of The Independent recently quoted Pakistan's president Asif Ali Zardari as saying "The water crisis in Pakistan is directly linked to relations with India" (Buncombe and Waraich, 2009). Pakistanis are often quick to assume the decreasing in the availability of the river's normal flows result from illegal diversions across the Indian border (ul Haq, 2010). In recent years, India's development projects along the rivers have aggravated tensions between the two states.

Most recently, Pakistan has disputed India's construction of the Baglihar hydroelectric dam on the headwaters of the Chenab River in Jammu & Kashmir (Ahmad, 2009; Wirsing, 2009). Although the Indus Waters Treaty permits India minimal use of the western rivers for development purposes, Robert Wirsing (2009) explains that Pakistan contested the size and position of the spillways, the amount of potential live storage, and the height of the intake tunnels. The fear was that the dam was intentionally

designed to “control the flood discharge of water on a scale… that the IWT had deliberately sought to preclude” (Wirsing, 2009:108). Following procedures outlined in the Treaty, Pakistan brought their dispute to the World Bank in 2005 and then to an independent arbiter, who adjudicated in favor of India’s plans (Wirsing, 2009). Since 2007, tensions between Pakistan and India over India’s development plans have heightened. Ahmad notes that Pakistani Foreign Minister Shah Mahmood Qureshi warned that any failure to resolve the water disputes "could lead to conflict in the region" (2009:5). Others have asserted that the increase in terrorist activity aimed at India in recent years, both in Kashmir and in India, has been motivated by Pakistanis’ anger at India’s use of their rivers (Buncombe and Waraich, 2009; Sharm and Wright, 2010).

While India and Pakistan have yet to war directly over water, Michael Klare (2002) has underscored the role water has played in the Kashmir dispute. He explains that Kashmir provides India strategic advantage over Pakistan, as well as serves as a vital source of power for a rapidly growing economy (Klare, 2002). If India and Pakistan were to come to a border agreement in which Kashmir gained independence or was annexed to Pakistan, India would “lose its status as the upstream riparian” (Klare, 2002: 187). He notes that as populations and concomitant demands for food and energy rise, and as available water sources are depleted, direct competition over water will most certainly escalate between the two countries (Klare, 2002). A recent US Foreign Relations Committee Report (February 2011) on water scarcity and stability in Central Asia concurs that accumulating stresses of climate change, population growth and economic development demands jeopardize the sustainability and viability of the Indus

Water Treaty. Moreover, although Pakistan is the downstream riparian, and the weaker power, Pakistan has been the aggressor in many the conflicts between the two states. Water scarcity that is perceived to be caused by India's misappropriation has great potential of inciting violent conflict over water.

Internal Determinants of Water Insecurity

Internally, Pakistan also faces significant water security issues that point to weaknesses in the state's capacity, authority and legitimacy. The first issue relates to the ethnic and provincial tensions that center on Punjab's dominant position in the political economy of the country. As the upstream riparian along the Indus Basin system, Punjab has been the primary beneficiary of the irrigation system and the natural flows of the waters. Yet, for decades Sindh, and to a lesser extent Baluchistan and the NWFP, has disputed Punjab's allocation of the Indus waters. The 1991 Interprovincial Water Distribution Accord, which specifies allocation per province per season, has not allayed the animosity. In negotiating the Accord, mediators relied on average annual flows from 1977-1982 to account for seasonal variability as well as inter-annual variability in flows and projected additional increases to total availability that would result from proposed storage (Pildat, 2003). The total usage amount was estimated to be 117 MAF, which was distributed between the four provinces accordingly: Punjab-55.94 MAF, Sindh-48.76 MAF, NWFP-5.78 MAF, and Baluchistan-3.87 MAF (World Bank, 2005). However, Khan explains that "continuous disagreement over the actual amount of water available in the Indus River system" persists "due to the fact that there is simply no reliable real-time

data available on actual water flow" (2009:91). The sentiment among many Sindhis alludes to a deliberate malevolence on the part of Punjab to take Sindh's waters. A paper by Sindhi Rasul Bux Palljo (2003) provides a summary statement that exemplifies the intensity of this sentiment. He asserts that his paper focuses on

> "the century-and-a-half long illegal, criminal and conspiratorial plunder of Sindh's share of the Indus Basin Waters, the serious water famine imposed upon Sindh, the ruin of its agro-based economy and the apprehended genocide of Sindhi people" (2003:4).

While not every Sindhi shares such strong hostility and distrust toward the water allocation between Punjab and Sindh, other Sindhi officials have expressed discontent regarding the process by which allocations were determined and monitored (Goindi, date unknown; Memon, date unknwn; Rizvi, 2000).

The animosity between the provinces over water distribution and allocation stems in part from weak institutions at the interprovincial level that are unable to ensure openness and equality during the negotiation process. The Indus River System Authority (IRSA) is the governing body established in 1992 to coordinate water sharing between the provinces (Khan, 2009). Rather than attempt to promote collaboration between provinces over sustainable use of the Indus system, the provincial representatives that comprise the IRSA maintain loyalty first to their ethnic affiliations, and "rig the system in their favor" (Khan, 2009: 92). In addition, the IRSA has minimal authority, as the provinces, particularly Punjab, often ignore the IRSA rulings (Khan, 2009). While provincial allocations for use were negotiated in the Water Accord 1991, Punjab proceeds to use the Historic Use Formula of 1994 as their determinant for water usage because it

apportions a larger amount to Punjab (Memon, 2005). Although this is in violation to the Water Accord, the IRSA has been unable to halt this practice (Memon, 2005).

Feisal Khan (2009) has addressed a number of additional examples of poor water governance and policy making that point to structurally induced water insecurity. First, he notes that investment in water infrastructure is significantly warped in favor of major projects (Khan, 2009). The extensive irrigation system, with all of its canals, barrages and linkages, is hugely underfunded and in disrepair (Khan, 2009). While the system requires an annual replacement and maintenance budget of US$0.6 billion, Pakistan dedicates approximately US$0.02 billion to water infrastructure maintenance, most of which goes to personnel (Khan, 2009:88). In addition, the inability to pass land reforms has denied Pakistan critical funds that can be dedicated to improving the water infrastructure that supports the agricultural economy (Khan, 2009). Moreover, Simi Kamal (2009) explains that the concept of water rights does not exist in Pakistan; instead landownership determines water ownership and access. Given that the majority of land is owned by a minority of the population, e.g. the landed class, most people's right to water is denied. Kamal also underscores the insufficiency of water governance, noting that "Pakistan does not have a single national regulatory framework" to provide "effective regulation, penalties, or conservation guidelines" (2009:39). The result is that despite the various agreements regarding how water is to be shared, "tail-enders," like Sindhis at the end of the Indus River System, receive disproportionately less water than what is legally allocated to them (Khan, 2009).

Poorly managed water systems in urban areas represent another structural inequality that directly links to human water insecurity. While Pakistan's major cities have been expanding rapidly, the level of investment into the public works has stagnated. Khan reports that in Pakistan's 10 largest urban areas, less than 10% of the wastewater is treated, and "household and industrial waste [mix] together and directly discharge into the nearest waterways" (Khan, 2009:88). The 2006 Human Development Report paints a dismal picture of urban water security. The report describes the lack of sewage treatment plants to limit the contamination of drinking water from human waste and industrial effluents, which has caused significant waterborne disease epidemics that pose serious public health threats. Arsenic and other contaminants have been found in the drinking water in Lahore, Islamabad and other major urban areas (Chaudhry and Chaudhry, 2009; Khan, 2009).

Such poor investment and oversight in water quality disproportionately affects the poor, because they have limited recourse to improve their situation. The large landowners and the urban elite possess the financial resources to install their own tubewells to improve the access to water, and can afford to purchase bottled drinking water, or purification systems. The poor depend on public wells, with restricted use, which often draw from untreated sources (Kamal, 2009). These disparities call into question the official documentation that reports that Pakistan is well above the target in terms of the number of people with improved access to safe drinking water (Watkins, 2006). Moreover, the inadequacy of water quality and availability for the average Pakistani emphasizes the effects of water insecurity on personal health and well-being,

and the extent to which water insecurity will lead to violent reaction. In his chronology of water-related conflict, Gleick (2008) reports that as a result of severe water shortages in the spring of 2001, groups in Sindh and Punjab rioted in the streets for several months, detonating at least one bomb, and causing numerous injuries.

The Implications of Water Insecurity in a Fragile Pakistan

In Pakistan, the experience of water insecurity is severe. The country faces significant constraints on the actual availability of freshwater resources, including a challenging hydrological environment and rapidly increasing demand. These constrictions pose serious threats to Pakistan's food security as well as development potential. Pakistan's water issues present a major challenge for a state that already exhibits weakened authority, capacity and domestic legitimacy. The difficulties experienced by the state to establish and maintain water security reflects the weaknesses in institutional capacity and political will to dedicate significant resources for the purposes of development. Much of Pakistan's political and social challenges derive from its obsession with India, which has obstructed the state's ability to create a strong state-nation. By externalizing the cause of water insecurity, Pakistan diminishes the state's responsibility to react and fulfill its responsibilities to the people. In Pakistan, the cyclical connection between insecurity and stagnant development is hard to ignore.

Water scarcity is not the only threat to Pakistan's water security. In July and August of 2010, Pakistan experienced one of the worst floods in over 80 years. Nearly one-fifth of Pakistan's total land area was submerged by flood waters that spread

throughout the entire country from Khyber Pakhtunkhwa to Sindh. The floods resulted from intense monsoon rains that fell so rapidly that the hardened earth could not absorb the water initially. Once rain water began to be absorbed, Pakistan's extensive irrigation and canal system were not prepared to handle the flows of water; as the Indus continued to swell, the water breached levees and overwhelmed embankments. This horrendous water disaster caused millions of people to lose their homes and livelihoods, posed significant health risks from water borne diseases, and resulted in the death of at least 1,300 lives (New York Times, November 2010).

Analysts assert that the floods will have a significant effect on Pakistan's development for years to come (Carment and Samy, 2010; New York Times, November 2010). The floods destroyed Pakistan's immediate crop seasons and further compromised agricultural productivity for the near future (Gall, 2010). Pakistan's textile industry is also likely to suffer, as the floods washed away substantial portions of cotton crops (Ellick, 2010). The extent of the agricultural loss challenges both Pakistan's economic capacity, but also human income, health, and food security. Ensuring the basic needs of a population of over 170 million is a huge task. In addition, the floods devastated much of Pakistan's infrastructure, including roads, bridges, communication lines, schools and health clinics (Gall, 2010). An analysis of the flood situation through the water security/state strength model suggests that this major water insecurity event has the potential of critically undermining Pakistan's stability. All four major features of state strength have been compromised, which overwhelm the state's functioning capacity.

Pakistan's political and social malaise also exacerbated the state's capacity to adequately respond to the floods. The government was overtly unresponsive during the first weeks of the floods. President Asif Zardari kept his scheduled trip to France and the United Kingdom rather than returning to Pakistan to assess the situation, which incited anger among many Pakistanis. Saeed Shah reported in the Guardian (August 8, 2010) the shared sentiment among many Pakistani's that the President's international trips "created an image of an indifferent, arrogant leadership". Military officers visited affected areas before the Prime Minister, which exaggerated the dissatisfaction with civilian government (Shah, 2010). The civilian government was also slow in providing food and other aid, particularly to the frontier regions (New York Times, November 16, 2010). In this capacity vacuum, the Taliban and other Islamist groups asserted their influence on public opinion by providing necessary food and other aid relief, and disparaging the government. Finally, the intensity of human insecurity and the state's capacity gap to adequately respond to that insecurity turned people further away from affiliation with the state, and more toward their affiliation with their communal groups.

Pakistan's water insecurity, both its long-term shortages and the recent floods, poses a serious risk factor to Pakistan's security. Significant investment needs to be made to ensure equitable and sustainable water security for both state development needs and human development needs. Considering the climactic challenges Pakistan faces, ensuring water security must fulfilled in a manner that emphasizes efficient water use and reuse. Pakistan's ambitions to keep pace with its neighboring rival, India, will perpetuate Pakistan's water insecurity, rather that provide necessary assurances. While major water

projects provide a minimum platform upon which water security is based, such infrastructure has little value if it is not maintained and if planning does not ensure long-term sustainability. While the water crisis discourse is often directed outward, Pakistan must address critical internal issues, such as water sharing among provinces and land reform. As water resources become scarcer, the potential for interpersonal and interprovincial conflicts over water will increase. By strengthening the interprovincial water sharing frameworks, this destabilizing factor can be diminished. In addition, implementing land reform will have the dual effect of increasing government revenues that can be rededicated to ensuring water security and of improving the structural imbalances that result in major gaps in the experience of water shortages.

Improving Pakistan's water security of course requires functioning government institutions. In the years to come, we can only hope that political leaders will set aside party politics and personal enrichment for the purpose of securing Pakistan's democratic foundations. Such a goal includes opening the political process to the entire population and distancing the influence of the military from politics. The Pakistan government needs to demonstrate to the Pakistani people that it can provide for their security and public welfare. Finally, Pakistan needs to liberate itself from its obsession with India. This obsession has unwittingly held the country's political, economic and social development hostage since its inception over 60 years ago.

CHAPTER 5

CONCLUSION

In this thesis, I propose that water security underpins the critical features that support state strength, particularly economic and human development. In contrast, water insecurity exaggerates the deep-rooted structural problems that place weak and fragile states at risk of failure. To demonstrate this relationship, this thesis reviewed and analyzed the literatures regarding water security and state failure. The proposed relationship between water security and state strength is based in part on the security-development nexus, which purports a mutually reinforcing relationship between the security and development. To further illustrate my thesis, I explored the case of Pakistan, which is both a water stressed state, and a state that exhibits many critical symptoms of failure.

Water security refers to having the assurance of having adequate supplies of quality water to sustainably meet all current and future water needs. It encompasses having physical and economic access to water resources, as well as having the fiscal and human capital to properly manage the resource in an equitable way. Water security also includes the ability to adapt to a certain level of water-related risk, such as droughts or floods. Establishing water security requires a minimum platform of functioning infrastructure and institutions that enable states to plan for short term and long term

needs, as well as to respond to water-related risks. The composition of the minimum platform varies across states, depending on the hydrologic environment and the development needs.

I present a model that attempts to depict the relationship between water security and state strength (Figure 1). In this model, water security supports four major factors that bolster state strength: institutions and infrastructure; economic growth capacity; human development; and human security. While water security requires the presence of existing institutional capacity and infrastructure, the model suggests that establishing water security reinforces other state institutions and infrastructure, because water infrastructure and institutions cannot function alone. Water security promotes economic growth because water serves as a critical input into nearly ever socio-economic activity. Ideally, as states experience economic growth, financial resources will be redirected back to maintain and expand water security. Water security promotes human health, gender parity, and improved livelihoods. Water is essential for all biological life, and therefore is a prerequisite for human development at the most basic level. Moreover, ensuring water security for human development advances human capital because clean water promotes health and productivity. Ensuring water security, particularly ensuring the basic water needs of the individual promotes a broad range of other human security needs like food security, income security, and health security.

In contrast, the implications of water insecurity on state-societal stability are multitude. Water insecurity implies low state capacity, particularly in regards to short and long term planning, insufficient institutions, and inadequate infrastructure. A deficit

in water infrastructure and institutional capacity is likely to be symptomatic of broader incapacitation across other domains. The inability to secure water resources hinders economic growth and human productivity. Water insecurity therefore undermines economic security for the state, as well as livelihoods, food security, and human health and well-being, all of which create a negative feedback loop that can undermine the capacity and legitimacy of the state. Water insecurity places additional stress on intergroup relations, intensifying feelings of inequalities between groups, which can test the state's monopoly of legitimate use of force and increase demands for state allocated social welfare.

Water insecurity is most problematic for failing and failed states, which are states that lack functional governments to ensure the safety and well-being of their residents. Failed states demonstrate a number of political, economic and social dysfunctions that underscore weaknesses in their authority, capacity or legitimacy. In failed and failing states, human insecurity is extreme and human development is stunted. Therefore, water insecurity exacerbates the weak governance and human insecurity. Failing and failed states lack the capacity or political will to establish and maintain the minimum level of infrastructure and institutions to establish water security and are thus much more vulnerable to water-related risks. Failing and failed states also lack the capacity or political will to ensure that the water needs of the entire population are met. In addition, the economic capacity of the state has been hampered because the state has been unable to exploit the benefits of water for productive use. Failing and failed states are unable to cope with the myriad of competing demands placed on them to ensure equitable water

distribution, plan for future water needs, and support other critical securities such as food and livelihoods. This unresponsiveness can exacerbate public dissatisfaction with the state, further weakening legitimacy and authority. Failing and failed states are also unable to mediate intergroup conflicts that may occur over intensifying water shortages. Therefore, populations experience growing levels of human water insecurity, and subsequent consequences on their health, well-being, and livelihoods, public demand for the state to fulfill its obligation to promoting security and public welfare will intensify, and possibly overwhelm the state's capacity to respond.

The review of Pakistan's political, economic and societal context reveals a country that has exhibited state weakness since its inception. Unlike most failed or failing states, Pakistan does exhibit many functioning institutions, particularly its military. However, Pakistan can be described as one of the most insecure security states, because its emphasis on military build-up in opposition to India has been to the detriment of all other critical areas of state strength. In Pakistan, the experience of water insecurity is severe. The country faces significant constraints on the actual availability of freshwater resources, including an erratic and dry hydrological environment and increasing demand. Inefficiencies in water management and narrow-sighted economic policy making have exacerbated Pakistan's problems, and point to overall deficits in state's capacity. I have argued that water security underpins state strength by bolstering the development of infrastructure and institutional capacity, and by promoting economic and human development and human security. Though Pakistan possesses the requisite institutions and infrastructure that would suggest that the state meets the minimum

security requirement, its emphasis on military competition with India has overshadowed all other development investments. Therefore, Pakistan has not adequately been able to exploit the water security for development nexus that would overall bolster their national security. In addition, the recent floods highlighted that Pakistan lacks the adaptive capacity to handle water-related risks. The floods have created a negative cycle in which Pakistan's economic capacity and infrastructure has been severely damaged, human security and human development significantly compromised, and state capacity evidently weak. While much needs to be done in Pakistan to reestablish and strengthen water security for the short and long-term, the state's capacity gap presents a major obstacle to overcome.

FIGURE

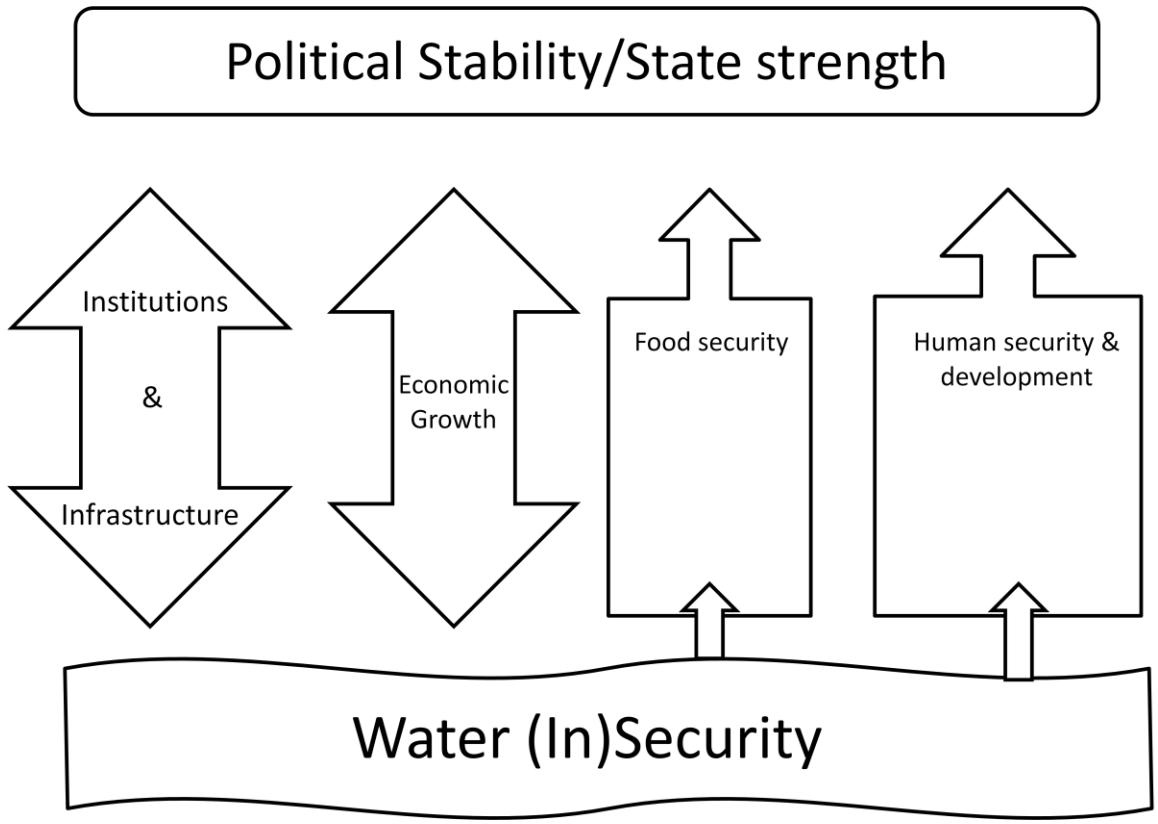

Figure 1: Water Security – State Strength Model

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