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an issue of enforcement

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China's ineffective water pollution policy: an issue of enforcement.

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Abstract

China faces an immense water crisis characterized by serious water pollution and water scarcity. The country's rapid economic development over the past decades occurred without the restrictions of environmental protection standards. In the past twenty years, China has made great strides towards environmental protection, including developing one of the world's most comprehensive set of environmental laws. However, the condition of China's water continues to devolve as issues of enforcement prevent environmental law from becoming reality. This enforcement gap is the primary issue in China's environmental policy. Prioritization of the economy over the environment, decentralization of enforcement power, powerless NGOs and EPBs, along with corruption and low public awareness of environmental issues create an enforcement gap that highlights weaknesses in the Chinese system and poses a sustainability threat to China and the global community. China's water and environment cannot see significant improvements until the policies set out by the central government are enforced at the national and local levels.

Introduction

China's unprecedented economic growth has both shocked and impressed the world, but what is perhaps more alarming is the country's failure to adequately address the environmental damage that has accompanied such rapid development. GDP and other indicators of quality of life are on the rise, but that accomplishment is tainted by an environmental crisis with long-lasting and widespread effects. China's environmental problems are so extreme because China has condensed the West's century-long environmental struggle into a couple of decades (Zhou et al 2014, 1243). Of particular concern is China's water crisis, comprised of serious water scarcity and catastrophic water pollution levels. Indeed, China's per capita freshwater resources measure only 2,000 cubic meters compared to the world average of 6,500 cubic meters (MacBean 2007, 294), while over half of China's river water is considered unusable due to unsafe levels of pollution (Miao 2011, 80). These depressing statistics of scarcity and pollution stand in great contrast to China's environmental law, which appears, at least on paper, to be an extremely well developed and comprehensive dedication to environmental protection. After years without any real environmental regulation or policy, China's development in environmental law was as swift as its economic growth. However, its seemingly stringent policies have not led to real results or progress. The consequences of China's actions and policies regarding water pollution and water scarcity are often little change and even worsening conditions. The Chinese government has stated that it aims to be a "five-type society," referring to a nation that is environmentally friendly, resource-conserving, ecologically civilized, economically green, and harmonious (Cai and Wen 2013, 339). Government and public concern regarding the environment have been rudely awakened, laws punishing polluters and setting environmental standards are laid out in the Chinese constitution and Environmental Protection

Law (EPL), and recent years have seen the emergence of more environmental NGOs, ministries, and environmental courts. What is preventing China from reaching its green GDP and its five-type society? The answer lies in the country's many barriers to the effectiveness of these laws and organizations.

This implementation issue is reflected in China's most prominent barrier to a successful environmental legal system: the enforcement gap. China's enforcement gap is the wide discrepancy between China's environmental law and its actual implementation. Enforcement in this paper refers to the ability of the Chinese government to implement its environmental law and handle and prevent pollution as it pertains to water. There is actually a saying in China, "*Zhifan*," meaning "enforcement is difficult," that communicates the growing frustration over the law's failure to achieve what it claims to be able to do (van Rooij 2006, 227). The problem China faces is not as simple as an inadequate set of water laws or a blatant disregard for environmental protection at the central or local level; rather, it is an enforcement gap created out of many different factors. The enforcement gap touches on political, economic, and social aspects of China's environmental structure, including the contributing bureaucratic and motivational problems. Insight into the implementation issues allows for a better understanding of the changes needed to achieve China's environmental goals. China's inability to effectively enforce environmental protection due to issues of prioritization, fragmented authoritarianism, corruption, and lack of environmental awareness are the determining factors behind continued environment degradation.

Perspectives on environmental degradation

There are many different approaches to the discussion of China's environmental degradation, all of which provide answers to difficult questions regarding responsibility, the right balance between economic and environmental concerns, and the morality and motivations behind decisions that lead to greater environmental harm. The following perspectives do not cover all the possible approaches to this topic, but they represent some of the most interesting and relevant ones to China's water pollution actions and policies. This section will also emphasize which players involved in China's environmental crisis share which particular views.

The tragedy of the commons is a well-known perspective to environmental problems that states that collective human behavior causes threatening situations when self-interest depletes a common resource (De Young 2014, 601). The modern system is such that people feel they must increase their consumption and use of a resource without limit, despite the fact that the resource is limited. This also means that a public resource like water, when not privately owned or regulated, will be misused. The issues discussed here are the depletion and pollution of China's water resources, both of which threaten China's current and future security. The tragedy of the commons is most likely to occur when it is difficult or unreasonable to restrict access to the resource, as is the case with water (De Young 2014, 601). A common response to the tragedy of the commons is to either centralize or privatize control of the resource. However, Chinese attempts to control water quality and availability have not been able to counter the tragedy of the commons due to severe enforcement issues. Key groups concerned with the tragedy of the commons issue include international organizations like the World Bank and the Global Environmental Facility, as well as international and domestic environmental NGOs. China is the largest recipient of environmental aid from many of these global institutions, including the World Bank, Asian Development Bank, and the Global Environmental Facility (Economy 2003,

5). Such global investment in China's environment demonstrates mounting international concern about the effects of China's environmental crisis on the rest of the world. China's water pollution and scarcity are causes of great concern not only for the Chinese government and population, but for everyone else as well. Earth's usable water is an increasingly precious and limited resource.

China finds itself facing a tragedy of the commons situation because of the results of two hypotheses: the race to the bottom hypothesis and the pollution haven hypothesis. The race to the bottom is the idea that states or regions disregard environmental standards or damages to compete for foreign investment (Zeng and Eastin 2011, 4). This feeds directly into the pollution haven hypothesis, which states that firms that find locations pursuing the race to the bottom attractive are most likely big polluters, so the regions supporting polluting behavior become pollution havens (Zeng and Eastin 2011, 4). Pollution havens then become key factors in a vicious cycle of less regulation and more pollution (Zeng and Eastin 2011, 1). It is no secret that the primary focus of China's government for the past few decades has been economic growth; therefore, it is also no surprise that policymakers and businesses act in ways that support the race to the bottom. Many environmentalists, policymakers, and academics also see the issue from this point of view, arguing that developing countries have to neglect environmental responsibility in order to become or stay competitive in the global market and lift up the economy (Zeng and Eastin 2011, 1). Of course, there are many who disagree with this analysis. Zeng and Eastin are examples of academics who argue that trade and foreign investment can actually lead to improvements in Chinese environmental health and can encourage self-regulation (Zeng and Eastin 2011, 2).

Another perspective, and one that has been publicly endorsed by the Chinese government, as well as businesses and companies, as a justification for the environmental tradeoff to its rapid economic growth, is the idea of the environmental Kuznet's curve. The theory is that environmental degradation gets worse as economic growth occurs until a certain income per capita level is reached; there, the trend will reverse. The Kuznet's curve presents an inverted-U relationship between the environment and economic development, where in the early stages of development pollution runs rampant, but levels and decreases as societies become wealthy (Dasgupta et al 2002, 147). My own research into local perceptions of environmental damages in China revealed that many Chinese believe the government operates on a "develop first, clean later" mentality¹. This perspective is consistent with the stages of development the majority of developed countries followed in previous years. The environmental Kuznet's curve is a convenient way for the Chinese government to legitimize its historically heavy focus on the economy because it allows for "temporary" environmental damage that will be cleaned up once economic goals have been reached. Unfortunately, cleaning up severe pollution is not a simple task, especially at the levels of pollution that China faces. Government officials' attitudes towards the environment are often informed by the Kuznet's curve because it is a convenient justification for their prioritization of the economy over the environment (Zeng and Ka 2011, 48).

This perspective is reflected in a lot of academic writing on the subject by scholars who see the idea that China must develop in a greener manner than the current developed world did is a form of Western hypocrisy. For example, Vaclav Smil wrote that the Chinese government

¹ In the summer of 2015 I received a research grant and traveled to Shanghai and Jiangsu Province in China to research the impact environmental degradation has had on the lives of urban and rural Chinese. Ni, Taili. "Environmental degradation in urban and rural China: a local perspective." *Sound Ideas: Summer Research*. Paper 253. http://soundideas.pugetsound.edu/summer_research/253.

already “pays more attention to the environment than was the norm in virtually all western countries at comparable stages of their economic development” (Smil qtd. in Schwartz 2003, 54). Jianguo Liu and Jared Diamond point out that although China’s pollution is the worst in the world, per capita resource consumption and pollutant outputs are much lower than in developed countries, thereby giving China “the moral right, as well as the power, to develop” (Liu and Diamond 2005, 1186). Thus, the Kuznet’s curve can be interpreted in a few different ways, but it is mostly used to justify development even when it comes with expensive costs.

The perspectives above speak to the development of China’s growing environmental problems, as well as hint at the underlying reason these problems are not getting better. China’s environmental policy suffers from an enforcement gap, which authors Carlos Lo, Gerald Wong, and Wilson Wai-ho have studied extensively. They note that enforcement gaps increase as one moves down the political hierarchy, reaching a height at the local and regional levels (Lo et al 2006, 389). Enforcement regulation comes from pressure on regulation agencies, prioritization of environmental regulation, observance of standards and penalties, and coercion/education, or how agencies deal with violators (Lo and Fryxell 2003, 84-5). Thus, problems with any of these contribute to the creation of enforcement gaps. In Western countries, there has been a focus on adversarial versus cooperative approaches to enforcement. Adversarial approaches work on the assumption that people respond best to the threat of punishment, while cooperative approaches believe that people respond to incentives (Lo and Fryxell 2003, 86). These authors suggest that a combination of the two approaches is likely to see the most success. The literature on environmental policy enforcement issues in China consistently stresses the need for prioritization; in fact, many scholars contend that prioritization has the greatest positive total effect on enforcement (Tang et al 2003, 75-7).

China's water crisis

China suffers from a complex and increasingly troubling water crisis comprising insufficient water for its large population, disproportionate water sources compared to population distribution, and various types of pollution leading to the deterioration of water quality. While this paper focuses primarily on the policies addressing water pollution specifically, it is important to understand the whole issue covering China's water crisis. Water scarcity and water pollution are directly related and influence one another. Accumulative pollution actually creates water scarcity even in places rich in water resources because it greatly reduces the amount of water that is safe to use (Guan et al 2014, 11052). This pollution-driven scarcity results in estimated economic losses of 350 billion yuan annually (Zhou et al 2014, 1245). China's water scarcity and water pollution are issues of global concern because they are not constrained by the Chinese borders. China is inevitably linked to the rest of the world because its pollution spills over into other countries. Therefore, understanding the roots of China's water crisis reveals implications for the international community as well.

Water Scarcity

One aspect of China's water crisis is the increasingly problematic scarcity of the world's most precious resource. In China, the water scarcity problem is twofold: first, there is not enough water, and second, that water is very unevenly distributed. China is home to a fifth of the world's population, yet only has access to seven percent of the global water supply (Zeng and Eastin 2011, 3). This significant discrepancy displays itself in the fact that one in three rural residents lacks access to drinking water, and that freshwater resources per person in China

amount to 2000 cubic meters compared to the world average of 6500 cubic meters (MacBean 2007, 294). China's immense population is the greatest strain on its limited resources. Recent factors that exacerbate the strain on water include decreasing household size and increasing number of households, a growing consumption culture, and a growing urban population (Liu and Diamond 2005, 1179). The annual shortage of water is between 5-6 billion cubic meters, and the urban demand for acceptable, usable water grows by 10.1 percent every year (Hofstedt 2010, 72). Cities rely on groundwater from aquifers, but these are rapidly exhausting (Liu and Diamond 2005, 1181). Out of 655 cities, 400 have no other source of drinking water, so the disappearing aquifer supplies are great cause for alarm (Li 2013, 14). China's depleting water sources are due in part to extremely inefficient industrial production and agricultural practices. For example, China uses twice as much water to produce paper than developed countries, and irrigation is inefficient (Liu and Diamond 2005, 1180). Agriculture accounts for 77 percent of the country's water use, while industries account for 18 percent and households account for 5 percent (Smil 2005, 31). This breakdown indicates that China has wasteful irrigation methods, a costly source of inefficiency for which it has long been criticized (Smil 2005, 31). One of the biggest contributors to irrigation inefficiency is faulty pipes that lose a lot of water (Smil 2005, 31).

The uneven distribution of China's water is an equally pressing problem without clear-cut solutions. There exists a great discrepancy between the amount of water in the north and in the south, with the north containing most of the country's population but very little of the water. Northern China is home to 42 percent of the population and produces 31 percent of China's GDP, yet it only contains 14 percent of the country's available freshwater (Hofstedt 2010, 73). The North China Plain has a per capita water availability under 150 cubic meters per year (Zhao

et al 2015, 1031). Indeed the people in this region have the least amount of renewable water in the world (Berkoff 2003, 2).

Such regional scarcity calls for solutions like the creation of aquifers and larger government projects aimed at balancing the current uneven distribution. China's aquifer mining extracts 8.8 billion cubic meters of water annually (Hofstedt 2010, 73). While aquifers contain much of the water supply for Chinese cities, in many cases they actually do more harm than good. Extensive digging of wells often leads to salt water intrusion in the heavily populated coastal areas, thus creating an expensive process of desalinization of wells (Hofstedt 2010, 73). Furthermore, big cities like Beijing and Shanghai have been gradually sinking over the past few decades because of mining and shrinking water tables (Hofstedt 2010, 73). The most prominent project currently under debate is the South-to-North Water Transfer Project (SNWTP). The project aims to annually divert 40-50 billion cubic meters of water from the Yangtze Basin in the south to the North China Plain, a move that is expected to provide water for the over 300 million people currently facing water scarcity in the north. However, the project is controversial because, like all of China's previous large public works projects, it would involve the massive reallocation of the surrounding populations, the manipulation of ecosystems and the corresponding environmental impacts (Berkoff 2003, 12). The controversy over the SNWTP shows how water scarcity is a complex issue without a clear solution.

Water scarcity is an extremely pressing issue for China and for the rest of the world. China's lack of water affects other countries, and its role in China's relations with other countries will likely grow in coming years. With China's increasing demand for water but dwindling supply, the industrial giant poses a threat to its neighboring countries. China has potential control over the water resources of countries in South and Southeast Asia. For example, China has built

three dams on the Mekong River and has plans or current construction for five more (Hofstedt 2010, 78). Since China is upriver of the Southeast Asian countries, it has not expressed concern for cooperating with Southeast Asian water policies. This could become very problematic if China's actions deprive Southeast Asian countries of their water sources. Furthermore, Tibet contains the sources of the major rivers flowing into China, India, Pakistan, Bhutan, Nepal, Bangladesh, Myanmar, Cambodia, Laos, Thailand, and Vietnam, home to 47 percent of the world's population (Hofstedt 2010, 78). This is significant because it provides more motivation for China to insist on its claim to Tibet and it means that China could control the water for almost half the world. It would not be impossible for additional conflict to come out of this geopolitical setup.

Water pollution

China's water crisis has become one of the greatest challenges the country faces, and this is largely due to its increasing water pollution. Many believe that water pollution is a much more serious and threatening problem than water scarcity (Li 2013, 15). There is no doubt that the combination of water scarcity and water pollution is a dangerous one with many consequences. Not only is China's water scarce and unevenly distributed, but what little there is is filled with chemicals, waste, and other forms of pollution that render the resource unusable. While the condition of China's water is at an unprecedented low, water pollution is not an entirely new issue. Water pollution grew rampantly beginning during the Great Leap Forward and the Cultural Revolution, periods in China's history that were characterized by heavy population density, great public works projects with no thought for environmental impacts, and the use of polluting technology in factories (Lo and Fryxell 2003, 82). Contributing to this period's

increase in water pollution was also the communist ideology of the environment as something to be conquered for the sake of industrialization (Lo, Fryxell, and Wong 2006, 389). These factors, combined with China's dedication to economic growth, created a norm of disregard for nature and the prioritization of economic development over care for the environment.

Today, water pollution in China has reached extreme levels. Seventy percent of the country's major water systems are heavily polluted (MacBean 2007, 294). The Chinese government divides water quality into six levels (Grades I, II, III, IV, V, and inferior V), where I is "pristine," II and III are good and drinkable, IV and V are recommended only for recreation and irrigation, and inferior V should not be used (Zhou et al 2014, 1243). More than half of the water in China's seven largest rivers (the Huai, Hai, Liao, Songhua, Yangtze, Pearl, and Yellow rivers) is classified as the worst quality. Most of the rivers' waters also cannot support aquatic life due to the high levels of cadmium, chromium, and other toxins (Miao 2011, 80-81). For example, economic projects and their accompanying pollutants are blamed for the sudden drop in the Yangtze River dolphin population, a creature that is now the most threatened mammal in the world (Ran et al 2013, 504). China has set standards for water quality, but these standards are far from being met. Between 1992 and 2007, 225 million tons of chemical oxygen demand (COD) accumulated in bodies of water. Chemical oxygen demand is the standard measure for the amount of pollution that cannot be oxidized in a water sample. The amount accumulated between 1992 and 2007 is estimated to require four times the amount of China's annual water to dilute it just to the minimum regulatory standard (Guan et al 2014, 11054).

Another severe and growing water pollution problem is eutrophication in lakes. Eutrophication is the enrichment of an ecosystem with chemical nutrients, often resulting in extreme plant growth (Zhou et al 2014, 1244). Many of China's lakes and waterways are

suffering from eutrophication, causing waterways to be clogged and impacting the water available to large populations. During my research in a village in Jiangsu province I noticed that the canal had been overrun with plants and the flow was disrupted, and many of the residents complained about the congestion (Ni 2015). Such clogging prevents water from flowing normally and affects agriculture and water availability for rural populations.

This excessive water pollution is caused by a number of factors. In China's rush to develop and stake its claim on the economic stage, it has neglected to care for the environment. The race to the bottom mentality has caused China to bypass setting environmental standards for production and industry in order to see the most economic growth. By transitioning into the factory of the world, China became a country that exports goods but leaves behind all the pollutants involved in production (Liu and Diamond 2005, 1179). Unrestrained and unregulated use of chemicals, especially fertilizers, is one of the greatest threats to water quality. China is the world's largest consumer of nitrogenous fertilizers, and sixty percent of these end up in the water supply when unregulated companies dump wastewater into lakes and streams (Smil 2005, 32). As the world's largest producer of fertilizer and the second largest producer and consumer of pesticides, China accounts for ninety percent of the global increase in fertilizer consumption since 1981 (Liu and Diamond 2005, 1180). Chinese industry has always been largely unregulated with regard to environmental management. In 1995, forty-five percent of waste water did not meet government-set standards even after receiving treatment; resulting in seventy-eight percent of rivers passing through cities to also fail to meet standards (Zhang et al 1999, 24). Such figures highlight the ineffectiveness of government standards as well as the vast amount of pollutants entering China's water. Even in rare cases where pollution discharge fee systems are in place for violations of wastewater standards, firms have been known to meet the standards by

mixing clean water with wastewater to affect the concentration of contaminants (Miao 2011, 81). Polluted water from industrial waste is then subsequently used for agricultural irrigation, resulting in foods filled with mercury, cadmium, lead, copper, and other toxic substances (Zhang et al 2010, 1116). Highly polluting industries contribute to pollution by dumping heavy metals, dyes, and poisonous chemicals into rivers and lakes (MacBean 2007, 293).

China faces more threats to its water quality in addition to industrial pollution. Human waste is also a huge issue in China's water quality. Eighty-percent of sewage flows directly into waterways without treatment (Beyer 2006, 195). Over half of 7000 tested water samples from rural populations were found unsafe for consumption due to the presence of untreated sewage (Zhang 2010, 1115). In fact, only thirteen percent of household waste is treated by sewage treatment systems (Chi 1994, 30). Not only is this contaminated water consumed by the population, it is also used for irrigation. It is estimated that around 7.5 percent of arable land is irrigated with sewage water, causing significant harm to crops and health (Fu et al 2007, 7600).

The most urgent and dangerous concern for the Chinese population regarding water pollution is the deteriorating health it causes. Environmental deterioration creates health risks that lead to 2.4 million premature deaths a year in China, primarily from cardiopulmonary and gastrointestinal diseases, cancers, and injuries (Zhang et al 2010, 1110). This reality brings public and government attention to pollution as one of the largest challenges China faces. During my research I interviewed many urban and rural citizens who all reported observing higher rates of respiratory diseases and cancers. Many of the rural residents knew someone who had died of cancer after spending years spraying or working around pesticides (Ni 2015). Negative health effects like these bring environmental problems to the forefront of the public's consciousness. An important factor to note about China is that it is uniquely susceptible to

multiple kinds of risks. Its distinctive identity as a rapidly developing country places its population at risk because of both traditional and modern factors. Traditional risks include things like poor sanitation and health issues from consuming unsafe water, while modern risks have to do with industrial pollution and waste (Zhang et al 2010, 1110). Due to the water scarcity described earlier, people are forced to utilize unsafe and contaminated sources, which is a huge health risk (Zhang et al 2010, 1114). Water scarcity also reduces the flow of water in rivers and lowers lake levels, which in turn increases the concentration of pollutants in the water (MacBean 2007, 294). Thus, water scarcity and pollution are closely related and contribute to each other.

Case study: water pollution and scarcity in Tianjin City

Tianjin City in Hebei Province lies in the Haihe basin, which is one of the most polluted and water-scarce river basins in China (Bai and Imura 2001, 24). Tianjin represents the struggle of most Chinese cities, and highlights in particular the problems of northern regions that face more extreme water scarcity. As the largest industrial center in northern China, Tianjin is hugely affected by water pollution and scarcity. The area experiences distressing levels of desertification, land subsidence, dropping water tables, and soil salinization each year (Bai and Imura 2001, 25-6). Tianjin is involved in the chemical, machinery, petroleum, cotton spinning, paper production, food and metallurgical industries (Bai and Imura 2001, 28). These industries contribute to water pollution by dumping chemicals and toxins into the waterways, and they are also major water consuming industries. The Haihe River Basin holds 3.3 percent of the country's area, 9.8 percent of the population, and 10.9 percent of the arable land, yet its portion of water resource distribution is only 1.5 percent, and per capita water resources are only 430

cubic meters a year, or 16 percent of China's average (Bai and Imura 2001, 25). Because Beijing is upstream of Tianjin, it has built dams that allow it to control 85 percent of the Haihe River's flow (Bai and Imura 2001, 27). This means that water arriving in Tianjin is not only severely limited, but it is also already heavily polluted from flowing through Beijing. This creates an extra burden on Tianjin to purify the water, and often results in the use of unsafe water. For example, most of the water used for agriculture and irrigation is untreated urban sewage water, increasing the rates of diarrhea and cancer among residents. In fact, Tianjin has a 0.02 percent higher mortality rate from these two risks than other areas in the country (Bai and Imura 2001, 28). Tianjin's water crisis is beginning to limit how much more industrial and agricultural development is possible. (Bai and Imura 2001, 28). Scarce and polluted water is not sustainable for continued development, and Tianjin is just one example of the many Chinese cities facing these pressures.

The water situation in Tianjin has not looked optimistic in recent years. A five-year regional plan (2011-2015) was created to address pollution of waterways, and while 77 percent of the targeted river sections were reported to meet national standards this year, the section of the Huaihe River flowing through Beijing, Tianjin, and Hebei was reported to have failed (Zheng 2015, 1). This is likely due to the relationship between Beijing, Tianjin, and Hebei. Beijing squeezes Tianjin, and Tianjin does the same to Hebei in response. Consequently, the rest of Hebei Province experiences even worse water pollution and deprivation than does Tianjin. Water resource management is an inter-regional issue and decreasing availability of clean water will only intensify regional competition. Tianjin and its surrounding area failed to achieve state standards in spite of the many new environmental policies that have emerged since the 1980s. Quotas for water use, environmental protection laws, and new conservation technology were not

able to create the desired effects (Bai and Imura 2001, 31). Thus, the need for capable enforcement of environmental policies is clear. Tianjin does have a Haihe Water Resource Management Committee, but it lacks power and has little impact (Bai and Imura 2001, 33). This reinforces the need for better enforcement of environmental policies.

Chinese environmental law

Chinese environmental law is a relatively new legal field. Looking at written environmental legislation alone would suggest that China has a detailed and comprehensive environmental legal system, but there are many issues with enforcement and compliance that will be discussed later. Chinese environmental law has become a full-fledged discipline in recent years. Of course, the main problem that China faces regarding its water crisis is not found in weak environmental law or a lack of good policy, but in the previously mentioned enforcement gap. Looking at China's environmental law serves to highlight China's recent and growing commitment to environmental protection.

Evolution of environmental law

On paper, China has some of the best environmental protection laws in the developing world. This was not always the case. Environmental law and policy in China has experienced tremendous growth in recent years. During the early years of the People's Republic of China, there was essentially no environmental law at all; pollution was even considered a capitalist problem until the mid-1970s (Zhang et al 1999, 28). In 1983, at the Second National Conference on Environmental Protection, the Chinese government officially addressed the connection between economic development and pollution, and founded the first formal framework for

environmental protection (Zhang et al 1999, 298-9). For the first time, a sense of environmental consciousness emerged in China that was both widespread and official. At this time, China also adopted international environmental standards, bringing the nation onto the modern stage for environmental issues (Zhang et al 1999, 29). At the third and fourth conferences in 1989 and 1996, as China's pollution problem grew, the government called for more detailed and firm environmental policies and standards (Zhang et al 1999, 29). Part of this call to take environmental issues more seriously resulted in a larger and larger percentage of GDP being directed towards environmental protection. For example, the Eighth Five-Year Plan (1991-1995) devoted 0.73 percent of GDP (130 billion yuan) to environmental protection, while the Ninth Five-Year Plan (1996-2000) called for 0.93 percent (360 billion yuan) to go to the environment (Lo et al 2006, 389). During this same time period, around 84,000 polluting firms were forced to close or relocate (Lo et al 2006, 389). In the past decades the Chinese legal attitude towards environmental problems has evolved from a focus on denial to cleanup to prevention.

The legislative framework for environmental protection laws in China is found in the country's constitution. This document conditions environmental protection to be a state responsibility and policy and contains the basic rationale and principles for environmental protection laws (Li and Li 2004, 21-22). The framework for all environmental legislation is the Environmental Protection Law, which details measures for prevention and conservation. It contains four principles for guiding environmental law: "coordination of environmental protection, pollution prevention, polluter responsibility, and enhancement of environmental management" (MacBean 2007, 299). China's Environmental Protection Law (EPL) was first passed at the Eleventh Meeting of the People Standing Committee of the Seventh National People's Congress in 1989 (Li and Li 2004, 22). The EPL remains the foundation of China's

environmental policy. Additional environmental laws can be found in China's civil code, criminal law, economic law, and labor law and administrative law, all of which have sections regarding penalization of crimes against the environment as well as conservation and prevention methods (Li and Li 2004, 23). It also gives protective responsibilities at the national level to the State Environmental Protection Administration (SEPA), and to local bureaus at the local level (Beyer 2006, 193). In 1998 SEPA became a ministry, giving it more power in national government (Lo et al 2006, 389). It is now the Ministry of Environmental Protection (MEP), and sits at the head of China's environmental law and has final say in determining national standards. Its primary role is to control policy guidance from the center; enforcement and interpretation of laws is left to local governments and local environmental bureaus (EPBS) (Economy 2003, 4). Since its promotion to a ministry, MEP, formerly SEPA, has been able to grow in size and capacity. Before its promotion, the institute lacked staff and resources. SEPA employed only 300 full-time professionals in Beijing, a low number compared to the 9,000 employees of the U.S. Environmental Protection Agency in Washington D.C. (Zeng and Eastin 2011, 45). The EPL has been amended many times since then, most recently in April of 2014 (Hogan Lovells 2014, 1). Amendments made in 2014 were primarily focused on developing a stronger basis for environmental protection that would see more success than the previous versions. Some of the key changes to the EPL included increased transparency by requiring firms and local governments to publicly release environmental monitoring information such as quality measures and the specific pollutants discharged by companies (Hogan Lovells 2014, 1). Other amendments include more liability for polluters and government officials whose performance regarding environmental protection is subpar, whistleblower protections, and a wider range of groups, like NGOs, who are able to file pollution claims (Hogan Lovells 2014, 2). These changes signal

growing central government concern and dedication for environmental law in China. However, changes at the central government level do face many limitations, including inconsistent central enforcement and policies (van Rooij and Lo 2010, 22).

An important aspect of China's "prevention first" approaches to pollution is the emergence of a mandatory Environmental Impact Assessment (EIA). EIAs are mandatory for all projects and developments in China, but only large-scale projects actually have to present the reports to the MEP, meaning that a lot of smaller projects can get away with not meeting requirements (Chan et al 1995, 335). Thus, although the Chinese commitment to greater environmental awareness and legal accountability is showcased through its well developed written law, there are still some holes in the law that allow for ineffective enforcement. Furthermore, China's environmental law contributes to the enforcement gap because many of the laws are not easily interpreted or applied to a variety of situations (Ross 1994, 31).

Water law and water resource management in particular have also experienced a changing process over the years, as environmental law as a whole has developed and adapted to the growing demands of pollution and climate change. During the Cultural Revolution, national water resource management did not exist because the relevant offices and personnel had been eliminated (Cheng and Hu 2012, 264). The 1982 constitution reinstated state ownership of water, and water laws began to emerge (Cheng and Hu 2012, 264). The 2002 Water Law reignited a focus on water allocation, water use efficiency, and conservation and protection of resources from pollution (Cheng and Hu 2012, 265).

Emergence of environmental courts

The environmental court is a new phenomenon in Chinese environmental law, though environmental courts exist in other parts of the world. While there were experimental environmental courts in the late 1980s, the functioning ones were established starting in 2007, and they are often divisions of the Intermediate People's Courts (Wang and Gao 39). Environmental courts came about in China as the result of pressure by local officials due to pollution of water reservoirs, lakes, and rivers. They were sorely in need by the time they came around, and they had long been advocated for. The first three true environmental courts were established in Guiyang, Wuxi, and Kunming as local government reactions to water pollution incidents (Knudsen 2013, 450). Their ability to handle environmental protests from the population made the environmental courts attractive to the central government, as the courts helped the government appear to be concerned about and responding to pollution problems (Knudsen 2013, 450). Chinese scholars label these motivations as "immediate," "deep," and "symbolic," where immediate reasons involve the government's image, deep reasons include structural changes, and symbolic reasons include that the government wants to be seen as sensitive to environmental issues (Knudsen 2013, 450). As of March 2011, China had a hundred environmental courts in fifteen provinces (Zhang and Zhang 2012, 363). Nor do the environmental courts go unused; within one year of establishment the Environmental People's Tribunal of the Qingzhen People's Court saw 110 cases (Zhang and Zhang 2012, 367). The specialized courts are both desired and useful because these are cases that would not otherwise receive much attention, if they were even accepted by the regular courts.

Environmental courts have a few unique qualities that differentiate them from other divisions within the judicial system. Unlike the traditional practice within Chinese courts, these do not have to distinguish between civil, criminal and administrative cases; they can accept all

cases involving environmental infractions. Furthermore, the environmental courts have incorporated enforcement authority so that they do not have to trust the enforcement of their court decisions to a separate division, as is normally the case (Wang and Gao 2010, 40). These distinctive aspects are important for a few reasons. The fact that the environmental courts have their own authority validates them and distances them somewhat from the central government and the Party. In many ways this can create new levels of trust in the courts; they appear unaffiliated with the Party and solely dedicated to their environmental purposes. Moreover, these courts can provide more consistency, both in outcome and enforcement, because they operate as a specific and independent legal system. Finally, the courts also promote and increase societal and government awareness of environmental protection needs. The attention the environmental courts generate is evident in increased online discussion of the environment, constant protests of polluting companies, and the steady stream of cases that continue to flow into the courts. There are four models of the environmental courts. The first is the independent environmental adjudication division, which exclusively hears environmental cases. The second is the environmental people's tribunal, which only accepts civil cases, criminal cases, and enforcement cases. The third is the environmental collegiate panel consisting of a panel of judges, and the fourth is the environmental circuit court, which uses the circuit division (Zhang and Zhang 2012, 372-4).

However, despite the success of environmental courts, they are often seen as more of a step in the right direction rather than a complete solution. Many doubt the effectiveness of the environmental courts alone. While the caseload brought to environmental courts is increasing, environmental cases still accounted for only one percent of total environmental disputes in 2010 (Zhang and Zhang 2012, 379). This arouses doubt about the real necessity of the courts and the

motivation behind their creation. Are they only symbolic figureheads of the government's stated intention to look out for the environment? Apprehension over whether the government is more in control of these courts than it might first appear exists among international observers and Chinese citizens. Could the government be pressuring courts not to accept cases aimed at enterprises too vital to the economy (Zhang and Zhang 2012, 380)? Furthermore, the low caseload creates "case-hungry" courts that follow three distinct trends: they act as symbols of state commitment to environmental protection, they take irrelevant cases just to sustain themselves, and sometimes they are eliminated because of their low caseload (Zhang and Zhang 2012, 379-80). In addition, the Chinese courts in general are not meant to interpret laws, but only to implement them (Beyer 2006, 189). This further limits the abilities of the environmental courts because it means that general or vague laws are difficult to uphold in different situations. Also, the courts are notoriously quick with environmental cases and do not involve much consultation with experts (Lo et al 2006, 392). This casts another shadow of doubt on how committed the courts are to environmental protection and their effectiveness at handling pollution cases. The Chinese government holds up its environmental courts as examples of success, similar to its emphasis on the solidity of its written law. However, the environmental courts are also not without problems and areas that raise questions as to their real effectiveness and motivations.

Barriers to the effectiveness of environmental law and the enforcement gap

China's main issue with its environmental law is a lack of enforcement, rendering its environmental laws ineffective. This discrepancy between law and practice is called the enforcement gap. China is a particularly good example of the enforcement gap because of the

scale of its environmental degradation and its written dedication to sustainability. Many other countries are currently facing environmental degradation as a result of development practices, but China's case is uniquely suited to a discussion of the enforcement gap. Not all countries prioritize the environment in their legislation, nor do they all have sufficient resources to bring about sufficient enforcement. According to Gregory Rose's paper for the 2011 UNEP World Congress meeting on environmental sustainability, many developing countries do not have the ability to effectively implement laws (Rose 2011, 6). China, however, with the proper institutions in place as well as comprehensive environmental laws, presents an interesting case to understand how the enforcement gap can manifest itself even in countries that seem very capable of enforcing policy. The enforcement gap is comprised of political, economic, and social factors that prevent China's comprehensive environmental law from resulting in cleaner water and a greener reality. The main components of the enforcement gap are prioritization of the economy over the environment, a system of fragmented authoritarianism, political corruption, and an overall lack of awareness about environmental issues. Together with other factors, these issues constitute the enforcement gap.

Political dimensions of the enforcement gap

Given the CCP's monopoly over political power, it is interesting that there are significant political barriers to the enforcement of environmental law in China. The central government is strong, and has the ability to quickly create policies without much debate or discussion. For example, the central government required Jiangsu Province to carry out directives to clean Tai Lake by the end of 1998. According to the media stories and the reports from the Jiangsu government, all of the standards and directives were met by the deadline, but deeper

examinations revealed the many ways enterprises cheated in order to pass inspections (Schwartz 2003, 51). This case demonstrates how even a strong central state cannot successfully enforce policies without the support and cooperation of other aspects of the political system. The state's capacity to enforce policies is limited without commitment across the board, something China currently lacks.

One big issue adversely affecting the success of water pollution laws in China is the fragmented authoritarian structure of the government. Despite China's preference for a strong central government, environmental protection bureaus (EPBs) can often be under the command of multiple bureaucracies (Zeng and Eastin 2011, 46). Due to multiple layers of authority, such as *tiao*, or vertical relationships, and *kuai*, or horizontal ones, EPBs often answer to many different bureaucracies and local governments (Zeng and Eastin 2011, 46). Furthermore, authority on water issues is dispersed across different agencies, and there is little communication or data sharing between these agencies or with the public. For example, the Ministry of Water Resources manages China's major rivers while local governments have authority over smaller water bodies; both, however, are divided into categories and subjects that are controlled by various state ministries (Yu 2011, 307). The central government alone has eight government agencies working solely on water resource management, which only results in weak and inconsistent policies (Cheng and Hu 2012, 266). The Chinese government's strategy is to provide policy guidance from the state and relegate environmental responsibility to local governments, but this results in confusing and inconsistent policies.

Other than the central government, key political actors in the push for environmental legal enforcement and protection are often groups like environmental NGOs. It is important to note that China is home to a phenomenon of government-organized non-governmental

organizations, or GONGOs. This oxymoron comes about from so-called NGOs that receive government funding as well as presumably, government pressure to act favorably (Wang 2009, 1). This trend is changing, however, and China's grassroots environmentalism has opened the door to NGOs and the media with its creation of partially free and independent groups. This means that NGOs do not publicly criticize or protest the central government and they stay away from politically sensitive topics (Economy 2003, 6). Since the government views NGOs as a threat to its legitimacy and security, it restricts the size, number, and nature of these groups (Zeng and Eastin 2011, 48). The relatively weak and limited position of environmental NGOs, even though they are freer than other types of NGOs in China, acts as a barrier to the effectiveness of Chinese environmental law by leaving the majority of environmental action to the central and local governments.

Environmental protection bureaus are the departments at the local level responsible for enforcement of environmental policy. Throughout the past years EPBs have made efforts to combat implementation issues, such as offering rewards for information about illegal discharges of wastewater or prioritizing lists of potential high-risk violators (van Rooij and Lo 2010, 27). Despite these efforts, EPBs are relatively powerless because they are starved for funds (Zhang et al 1999, 28). The EPB also suffer a curious existence because they are dependent on continued pollution in order to receive funds. The EPB's funds come from local governments and pollution fees; therefore, the EPB needs pollution to gain the funds to combat pollution (van Rooij 2006, 64). Many EPBs are also subject to political corruption because EPB officials and industries often have very close ties, paving the way for bribes (Schwartz 2003, 69).

Environmental protection and enforcement of environmental policies rely on local governments to be successful. However, political corruption is a very present factor at the local

level, and greatly interferes with enforcement. Local governments tend to have slightly different goals and motivations than the central government, and the system of fragmented authoritarianism allows them to act according to these motivations. Economic growth is crucial at the local level too, and in many cases local officials face high incentives to report economic success. There is a close link between local governments and polluting enterprises; in fact, local governments are often major shareholders of these enterprises, creating a common conflict of interest (Beyer 2006, 207). Township and village enterprises (TVEs) actually help local and state economic growth more than state-owned enterprises (SOEs) because TVEs produce 30 percent of rural income (MacBean 2007, 293). TVEs also lack the environmental management capabilities necessary to operate in an eco-friendly way (van Rooij 2006, 114). Because of this, they are prized by local governments who do not want to see profits or outputs fall once environmental protection measures are put in place. Thus, local officials are willing to warn TVEs of inspections in advance so that they can stop polluting practices just long enough to pass a test called for by the state (MacBean 2007, 293).

It is also very possible that one reason for the discrepancy between Chinese rhetoric and reality is that the central government is not as committed to environmental protection as its laws, stated goals, and participation in international treaties would suggest. Because of the magnitude of China's environmental issues, there is a lot of domestic and international pressure on China to pursue sustainability. An easy way to demonstrate this commitment is through creating good environmental policies, but it may be just that: a show rather than true dedication (van Rooij 2006, 67). Furthermore, because of the increasing citizen unrest, which will be discussed later, the CCP's determination to appear dedicated to the environment could also be a way of placating the public.

Economic dimensions of the enforcement gap

Political corruption as described above is closely linked to the economic factors interfering with successful implementation of environmental law. Government and individual prioritization of the economy over the environment results in very weak and unmotivated environmental protection. There is a conflict between the central government's stated priorities, where the environment takes a high position, and the interests of the individuals and organizations that are supposed to put those priorities into action. National legislation lacks legitimacy with local governments, and local officials often engage in location protectionism, which is when local governments protect economic interests over the environment (van Rooij 2006, 61). This is a huge issue in China's enforcement problem. Solid though the laws might be, they are stopped at the local level and prevented from improving China's water crisis. Government officials in China are not the ideal protectors of environmental policy because they lack motivation and a value for environmentally sound decisions (Lo et al 2006, 389). Some blame this motivational deficiency on the older communist mindset that saw nature as something to be dominated for industrial projects (Lo et al 2006, 389), but the problem is less abstract than a political mindset. Government officials, especially at the local level, have no economic incentives to enforce environmental law. They are often personally invested in the economic success of local firms, and do not want to impede on their company's or region's economic growth to uphold environmental policies (Beyer 2006, 207). There is no relationship between policy implementation and fiscal reward, so local officials do not prioritize the environment (Lan et al 2011, 4). Local officials often have a "race to the bottom" mentality towards development, meaning that they pursue economic gains single-mindedly and without the perceived costs of

environmental protection measures. My research in China found that many citizens were critical of government officials for ignoring environmental needs in favor of economic gains. They complained that many officials are shortsighted, pursuing short-term economic goals rather than dealing with environmental issues (Ni 2015). Delegating environmental responsibility to local governments also encourages a vicious cycle where poor regions actually experience worsening pollution (Economy 2003, 5). The central government does not allow World Bank money to go to poorer regions with a higher likelihood of defaulting on loans; as a result, local officials in these regions limit fines for pollution violations in order to protect the local economy (Economy 2003, 5). Thus, we see a new “race to the bottom,” where poorer regions are denied environmental funding and then further deviate from existing environmental regulations in order to protect its economic enterprises.

Additional economic barriers to the success of environmental law have to do with funding. This also plays into the priorities of local governments because they determine what receives funding. For example, the environmental bureaucracy sorely lacks funding and personnel, causing enforcement management and technology to suffer (Economy 2003, 1). Between 2001 and 2006 (during the 10th Five-Year Plan), Chinese central-level funding for environmental protection increased from 0.73 percent to 0.93 percent of GDP (van Rooij and Lo 2010, 21). Nevertheless, Chinese environmental management is still vastly underfunded and the government does not spend as large a portion of its GDP on the environment as do other nations (Tang et al 2003, 90). EPB officials are also not trained in environmental issues and responsibility and are less likely to commit to environmental protection (Schwartz 2003, 69).

Cultural and social dimensions of the enforcement gap

Social and cultural factors also play into China's legal enforcement issues, primarily because they prevent victims of polluting enterprises from affecting change. The political and legal system also do their part to keep unwanted complaints silenced, but a common problem in China is that people do not even try to step forward. There is a strong inclination in China, stemming from its Confucian roots of social harmony, to prevent disputes rather than to bring up issues and seek punishments (Beyer 2006, 190). The documentary *The Warriors of Qiugang* states, "It's not that Chinese people lack ideas. They don't want to be the first to act" (*Warriors* 2010, 3:20). This tendency away from actions that disturb social harmony also finds its way into the court system. Most of the cases seen in the environmental courts are actually resolved through mediation (Beyer 2006, 190). The value put on social harmony and mediation explains why the Chinese public is largely reluctant to bring cases and their complaints forward. In Baocun village, a farmer named Yang's rice crops have turned red, a clear result of the phosphor chemical fertilizer plant just a few hundred meters away from his field, yet he has never reported the obvious violations to any EPB or local official because he does not want to cause trouble and because he appreciates the economic gains the factory brings to his area (van Rooij 2006, 107-8). This is just one of many examples of the relationship between cultural values and political action or inaction.

Another important social issue undermining the effectiveness of environmental law is an overarching lack of awareness about the causes and risks of water pollution. The government's dedication to bettering its environment is evident in its inclusion of environmental protection in its Five Year Plans, but awareness among many government officials, enterprises, and the public is not widespread enough. Despite a recent increase in awareness, the overall environmental consciousness in China is low (Beyer 2006, 186). During my research in China many urban and

rural residents cited a lack of awareness as one of the primary reasons for deteriorating environmental conditions. Interviewed residents of Baqiao, a village north of Shanghai, cited low awareness as the reason many of their neighbors threw garbage into the canal even though the village now has designated areas for waste (Ni 2015). In general, the Chinese public has not been accustomed to feeling responsible for maintaining public areas; cleanup has been largely left to the government, thereby embodying the tragedy of the commons. Part of the lack of awareness among the public and among government officials is the idea of the Kuznet's curve. People assume that once economic development goals have been reached, the acquired wealth can be used to clean up any environmental damages that may have occurred. Of course, this is not always easy to do, as the Chinese case certainly shows. However, public awareness is on the rise, resulting in citizens who demand cleaner surroundings (Schwartz 2003, 72). This also translates to the issues with legal implementation because there is also ignorance about the law at many levels of society. Often, polluters do not even realize that their activities, or the activities of their firms, are not just harming the environment but are also breaking the law (Beyer 2006, 186). Among developing firms, local officials, and the Chinese public there is a low awareness of environmental risks and the steps being taken to improve the situation; indeed many people are not aware of systems for monitoring or checking pollution (Zhou et al 2014, 1251). China invests in education less than half that of developed countries as a proportion of GNP, which is a large contributing factor to low public environmental awareness (Liu and Diamond 2005, 1184). Thus, increased attention to and development of environmental education is a clear way to expand awareness.

Increasing citizen dissatisfaction with environmental degradation

Although there is an issue of low awareness of environmental policies and issues among the Chinese public, there are also more and more protests coming out of the public's growing frustration with the quality of the environment. Certainly, as mentioned above, awareness is growing, with the CCP publication *People's Daily* poll revealing that environmental concerns are one of the most pressing issues for citizens (Vines 2014, 1). Many people notice changes in their everyday life, their health, the quality of their water, air, and food, causing great levels of alarm. In addition, social media now plays a role in communicating some of the darker environmental statistics that the Chinese media is not eager to share (Vines 2014, 1). Citizens have begun protesting for greater transparency, a larger role in the decision-making process, and for a deeper commitment to environmental protection (N.D. 2014, 1). Numerous protests have formed in recent years concerning the state of the environment. They began in rural areas but have now moved to cities, making them hard to ignore (Vines 2014, 1). For example, in June of 2007, a thousand Haidian (a district of Beijing) residents gathered at the site of a proposed incinerator in protest (Lang and Xu 2013, 836). This initial protest resulted in the project being delayed, and a subsequent protest succeeded in canceling the project and relocating the incinerator (Lang and Xu 2013, 838). There are many other examples of successful protests regarding environmental issues. In fact, the State of the Environment report in 2014 documented 712 "abrupt environmental incidents" in 2013, 31 percent more than the preceding year (Vines 2014, 1). However, it is important to note that many of these "successful" protests are only successful from a NIMBY (Not in my backyard) standpoint. Projects are often relocated, as in the above example, meaning a victory for the protesting citizens, but not a victory for the overall environment.

The CCP is known for its harsh crackdowns on protests, but it has been unusually tolerant and at times even cooperative with these environmental protests. Instead of regarding all protests as a threat to state security, the CCP seems to realize that the threat of unresolved environmental damage is greater than the threat of peaceful, organized citizen protests. The government's response to these protests is also a chance for the CCP to demonstrate its dedication to sustainability. In addition, it allows the CCP to lift the lid of the "pressure cooker" that is Chinese political society. By positively responding to citizen demands, the CCP can appease people and make them feel that their voices are being heard. Of course, just because the CCP appears to address the public's concerns does not ensure that real environment progress is being made. As mentioned above, projects are often stalled or relocated, which moves the problem elsewhere.

Conclusion

China's enforcement gap is a real problem that will not go away just by giving the country time because it is an institutional problem that permeates political, economic, and social areas. Other perspectives on China's water crisis take its comprehensive environmental law and its strong central government as proof that China has all the materials it needs to see effective environmental policy. Still others view China as a country that is steadfastly pursuing economic growth without consideration for the environment. The enforcement gap shows that both of these perspectives miss the mark. China's environmental law does represent a national commitment to better environmental protection and a greener GDP. China has developed a full set of environmental laws and greatly increased awareness about the environment in a very short period of time. That rapid progress, combined with its continued inclusion of environmental

protection in its top priorities in its Five Year Plans, proves that China is concerned with its sustainability. However, it does not reach its environmental goals and while its law might be comprehensive, it is not implemented. China's environment will not improve with time because its issue is a system that currently incentivizes economic gain over all else and allows for very lax enforcement of environmental policy. The factors that make up the enforcement gap require serious attention in order to successfully implement policy.

Proposed here is that China requires a reshuffling of its priorities, increased environmental education, and stronger central leadership guidance to find its way out of the enforcement gap. No amount of time and no revision of the written law will affect change in China's environmental situation if decision-makers still prioritize the economy over the environment in every circumstance. Since low awareness is also such a pervasive issue for polluters and the public alike, there needs to be better education of pollution, environmental risks, and the existing environmental legal system. Introducing ideas about environmental conservation and protection to the public can affect a paradigm shift towards a national and global society with new priorities and values. Finally, the environment may be the one aspect of Chinese politics where a call for greater central government control makes sense. China has the strong central government that should be able to enforce its laws without delegating all environmental responsibility to the local level. Greater central government control can enforce consistent standards and policies across the board, reducing local protectionism, and the creation of incentives for environmental protection can cut down on corruption. Of course, the enforcement gap requires a lot of big shifts and changes in approach. Future research into how best to achieve these shifts, as well as research into better water purification and water resource

management technology, will be beneficial to China and other countries suffering from water pollution, water scarcity, and enforcement problems.

China has the moral obligation to clean up its environment and prevent the current situation from deteriorating further, not just for its own vast population but for the global community as well. Water is Earth's most valuable resource, and the interconnectedness of China's water pollution and scarcity present a dangerous message about our future. China's current water crisis serves as a lesson and a warning to other countries about the risks of ignoring environmental health in pursuit of economic development. China's struggle to reverse the damage that has been done is costing a lot of money and is proving very difficult. Worsening pollution and water scarcity threaten the development and health of the entire country. Years of industrial use of water without consideration for the environment have resulted in a tragedy of the commons condition, where China is rapidly depleting what little water it has while polluting the rest with chemical waste. Governments must find a way to enforce environmental policy so that this resource is not poisoned and exhausted. China's efforts to address water pollution have been impressively fast-paced and considerate, but it is clear that until the enforcement gap is becomes a focus and a target for change, environmental law will continue to fall short and China's goal of a five-type society will be out of reach.

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