

## Water Wars in the Middle Kingdom

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### Abstract

*China's government has warned that by 2030 the country will have exploited all available water supplies. Over 40% of the water in the seven largest river systems is too polluted for human consumption, and environmental degradation has begun to trigger civil unrest. China's damming projects have provided a large and necessary reservoir of water and much needed hydropower, but at the cost of millions of internally displaced persons. Internationally, China and India remain at odds over disputed border territory, and China's damming on the Tibetan Plateau is a cause of concern. Populations in India, Pakistan, and Bangladesh rely on these rivers. Disrupting the water supply threatens the uneasy peace and could exacerbate existing tensions between India and China. Beijing has taken steps to reduce its impact on the environment, but demand has outpaced these efforts. China's environmental security and water resource problems pose great challenges, but the sooner Beijing addresses these problems, the sooner it can achieve its goal of the "Chinese Dream."*

## **Introduction**

China's unprecedented economic growth has had tremendous benefits for the country, raising the standard of living and annual disposable income and making the country a world power.<sup>1</sup> However, the environmental costs of such growth have been tremendous. China's government has warned that by 2030 the country will have exploited all available water.<sup>2</sup> In an effort to rectify the issue by decreasing demand and increasing supply, Beijing has implemented water conservation policies and engineering projects to transport water to areas that need it most. Additionally, to increase hydropower and alleviate the stress on water sources, China has increased damming projects, providing the country with a large reservoir of water and much needed hydropower. The benefits provided by damming have come at the cost of both internally displaced persons and international concern, as downstream populations in India, Pakistan, and Bangladesh rely on some of the rivers China has targeted for damming. While the prospects for war resulting from a water dispute in the Himalayan watershed are small, they are very real and must be treated with a great deal of respect; the historical context, the confluence of nuclear-armed players (China, India, and Pakistan), and the concentration of human populations in the region complicate the issue. Water is often a source of compromise between nations. However, a dispute over this resource may catalyze existing tensions and ignite a deadly conflict in the Middle Kingdom. Despite the great challenges posed by China's environmental security and water resource problems, options exist to stem the potential for conflict. The sooner Beijing addresses these problems, the sooner it can achieve its goal of attaining the "Chinese Dream."<sup>3</sup>

## **China's Water Security: Domestic Concerns**

Driven by a growing energy demand, an increasing standard of living, and an expanding industrial economy, China's demand for water is outpacing nature's ability to replenish the water supply, placing the country on an unsustainable path. The very industries that are driving the demand for water are exacerbating the problem by polluting the clean water that is available, thus creating the compound problem of water scarcity and water

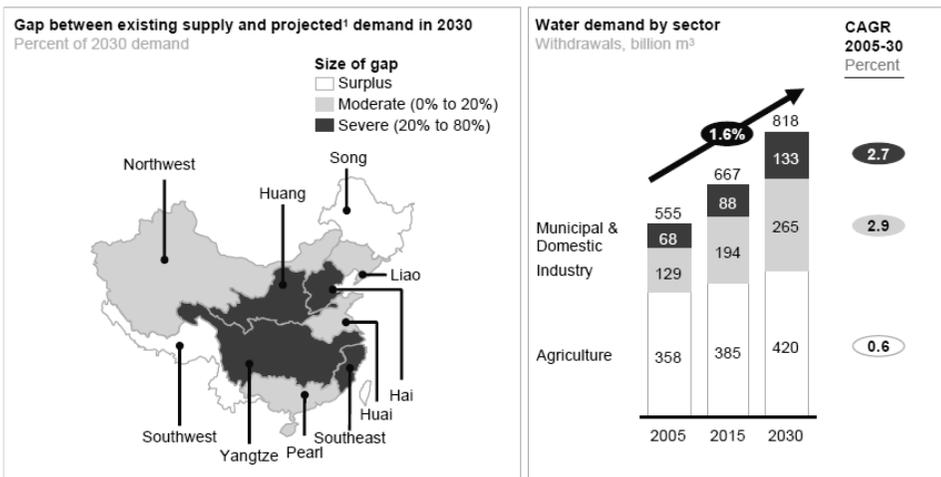
pollution. One solution Beijing has implemented is damming rivers on the Tibetan Plateau in an effort to store clean water that can be used for hydropower and then used again downstream for agriculture, commercial, or consumptive purposes. India, Nepal, Bhutan, and Pakistan have also proposed regional hydropower projects that have the potential to worsen water scarcity issues.<sup>4</sup>

According to a United Nations report on managing water and risk, much of the Himalayan region's water supply is already either "heavily exploited" or "over exploited."<sup>5</sup> Growing populations and climate change will exacerbate the water stress. Although China is concerned with international security issues, its primary concern remains internal stability. Beijing spends more on domestic security (769.1 billion Yuan in 2013) than it does on its defense budget (740.6 billion Yuan in 2013).<sup>6</sup> Part of China's strategy to ensure domestic stability is continued economic growth.<sup>7</sup> This economic growth, however, is mirrored by an insatiable increase in energy consumption.

From 2000 to 2011, China's net consumption of electricity increased from 1.18 trillion kilowatt-hours to 4.21 trillion kilowatt-hours.<sup>8</sup> Mining coal and natural gas to meet this demand is water-intensive, and approximately 70% of China's coal mining facilities are located in water-stressed regions.<sup>9</sup> Additionally, power plants demand large volumes of water for cooling, placing an additional burden on the water supply. China's energy sector places a great strain on the nation's overtaxed water resources and withdraws approximately 61 billion cubic meters per year, or about 12% of the country's freshwater withdrawals.<sup>10</sup> As China's population continues to grow and as the standard of living continues to improve, demand for energy will increase and further exacerbate the problem.

Despite Beijing's efforts, which include instituting policies to slow demand through water usage caps and infrastructure investments,<sup>11</sup> water consumption reached a record 599 billion cubic meters annually in 2011.<sup>12</sup> China has undertaken massive engineering projects designed to bring water from the south, where it is more abundant, to the north. Zheng Chunmiao, the director of the Water Research Centre at Peking

University, has voiced concern that such engineering projects are insufficient and that China must reduce its water consumption.<sup>13</sup> In addition to China’s rapidly growing water consumption, from 2000 to 2011 the country’s fresh water resources dropped over 16%.<sup>14</sup> In Hebei Province, where Beijing is located, ground wells had to be dug to 120-200 meters in 2010, an increase from just 20-30 meters in 2000.<sup>15</sup> Figure 1 shows China’s unsustainable path, with the dark blue areas representing a supply-to-demand gap of 20% or greater.



**Figure 1: Water Supply and Demand Gap in China<sup>16</sup>**

Two-thirds of China’s cities already experience water shortages and “about 300 million rural residents lack access to safe drinking water.”<sup>17</sup> The United Nations defines an area as “water stressed” when annual water supply drops below 1,700 cubic meters per person and as “water scarce” when that supply drops below 1,000 cubic meters per person.<sup>18</sup> In 2007 the average water availability in China was 1,869 cubic meters, and was only 828 cubic meters in the country’s north.<sup>19</sup> An increase in mass protests related to environmental issues presents a genuine threat to a government focused on internal stability. It is even more challenging to address the increasing demand on water resources while maintaining robust economic growth in a country that has pinned that growth on water-intensive industries with lax environmental regulation.

Although methodologies and estimates vary, the total cost of pollution to China's economy is often estimated at between 2.5% and 3.5% of the country's GDP.<sup>20</sup> The World Bank estimates that the total damage to the ecosystem costs China nine percent of its Gross National Income.<sup>21</sup> Greenpeace came to even worse conclusions in a 2007 report, which states that the costs of coal pollution alone account for 7.1% of the country's GDP.<sup>22</sup> China clearly has a pollution problem, and while China's air pollution is well-known, water pollution may be more likely to lead to conflict.

Increasing demand and water pollution limit China's total available water supply. Over 40% of the water supply in China's seven largest river systems is too polluted for human consumption, leading China to seek new sources of water.<sup>23</sup> In fact, "of 4,929 groundwater monitoring sites ... 41% had poor water quality. Almost 17% had extremely poor water quality."<sup>24</sup> Wastewater from industrial runoff is cited as one of the primary causes of polluted water. However, the lack of available safe water forces local populations to use contaminated sources, and the combined effects of water scarcity and water pollution manifest themselves as a public health problem.<sup>25</sup>

A recent report in *The Lancet* asserts that only half of China's major rivers and less than a quarter of its lakes are considered safe for human consumption even after treatment.<sup>26</sup> The report continues:

Estimates attribute about 11% of digestive cancer cases to chemical contaminants in drinking water, indicating that the disease burden from industrial water pollution, oil and gas industries, manufacturing, and other sources, already poses major challenges for the health of China's citizens.<sup>27</sup>

Disease caused by pollution is creating a health crisis in China. Lax industrial pollution control standards are partly to blame for China's polluted water system. A reported 1,700 industrial water pollution "accidents" occur each year, resulting in 60,000 premature deaths

annually.<sup>28</sup> As the country's water issues worsen, the Chinese people are becoming increasingly aware of the problem.

Environmental degradation has begun to trigger civil unrest, a key concern for Beijing.<sup>29</sup> Chen Jiping, a former leading member of the Communist Party's Committee of Political and Legislative Affairs, stated that China sees between 30,000 and 50,000 mass incidents, or protests, every year and that a primary cause of these incidents is environmental concern.<sup>30</sup> Additionally, Chinese citizens have taken to blocking the construction of polluting industries. In October 2012, thousands of residents in Ningbo took to the streets and clashed with authorities over the construction of a petrochemical complex.<sup>31</sup> Ministry of Environmental Protection (MEP) Minister Zhou Shengxian stated, "With the increase of environmental mass incidents, pollution has become the 'primer' for social instability."<sup>32</sup>

"Mass incidents" over environmental issues have become increasingly prevalent in China. In fact, the trend for such incidents is rising; there were 8,700 incidents in 1994; 90,000 in 2006; and 180,000 reported in 2010.<sup>33</sup> With a "mass incident" being defined as "demonstrations, protests, picketing, petitioning and even vandalism ... that involve [greater than] 100 people,"<sup>34</sup> the growth in the number of these incidents should be particularly disturbing for a centralized government focused on internal security, stability, and control. In 2005 thousands of villagers in Dongyang blocked the roads for more than two weeks protesting a chemical plant that was polluting water and making people ill. Authorities were dispatched to the region to break up the protests, and "three thousand police arrived with cattle prods to break up the roadblocks and found themselves defeated in a pitched battle with more than twenty thousand residents summoned from nearby villages by firecrackers."<sup>35</sup> The occurrence of such incidents shows that China faces a very real environmentally based security threat.

In addition to its citizens taking to the streets over polluted water, China also faces problems from angry migrants who have been forced to resettle as China builds dams in an effort to meet its energy needs. Estimates of the total number of displaced persons in China vary from 10 to 20 million

between 1950 and 1990.<sup>36</sup> Approximately 1.1 million were displaced by the Three Gorges Dam alone.<sup>37</sup> Although dams provide a number of benefits, including a power source and flood control options, China has an abysmal record on providing for the populations affected by the creation of its dams. Internally displaced persons in China often face impoverishment, replacement of their land with smaller and poorer-quality tracts, loss of social networks, culture shock, and unfair employment opportunities such as the ban on migrants receiving certain jobs.<sup>38</sup>

In addition to the problems it faces due to its population of internally displaced persons, China has been conducting a counter-insurgency operation in Tibet that has direct implications for water security. While scholars disagree as to the extent of Beijing's vulnerability to the Tibetan insurgency, it nevertheless remains a concern for China.<sup>39</sup> Adding to the complexity of the conflict, the insurgency has recently begun focusing on the water resources of the Tibetan Plateau. Chinese mines have repeatedly contaminated local rivers, killing livestock and rendering the water unsuitable for consumption, which has had a direct destabilizing effect on the local Tibetan population.<sup>40</sup> Additionally, a report released by Circle of Blue asserts, "a number of influential scientists and experts in Asian studies now say that control and management of an even more vital resource – the Tibetan Plateau's vast supply of freshwater – is also emerging at the center of the increasingly tense political and cultural strife between China and Tibet."<sup>41</sup>

A large population with increasing demands, an energy sector that requires large quantities of water, an expanding middle class, and an economy that places little value on environmental stewardship all contribute to China's water security dilemma. The domestic problems surrounding water have become an immediate issue for Beijing; the rapidly rising number of "mass incidents" and growing unrest throughout the country are major concerns for the central government. To ameliorate the populace Beijing needs to show strong leadership and a holistic commitment to the people of China, not just a commitment to economic growth. China has taken steps to reduce its impact on the environment, but demand has outpaced these efforts. One of the reasons Beijing's strategies have been ineffective

is the lack of a central agency to coordinate implementation and enforcement of laws. If China wants to achieve sustainable economic growth, short-term sacrifices will be necessary. If Beijing makes a conscious choice to manage and shift the economy away from harmful practices, it will be able to control the economic changes and appeal to the population. Ignoring the consequences of its past policies will lead to further environmental, and by extension, economic harm.

### **China's Water Security: International Concerns**

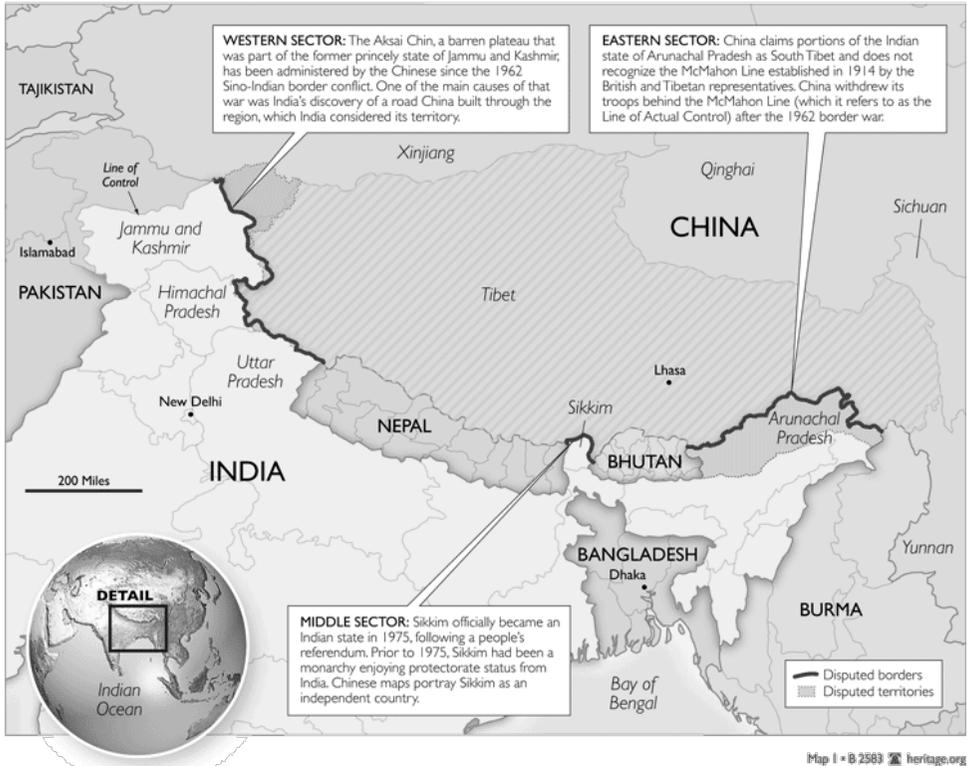
In addition to the many domestic security issues surrounding water in China, there is a growing international component to China's water security. The current water conflict in the region is only the latest in a long history of disputes and tension. Tibet, for example, remains a politically charged topic for both China and India. The Tibetan uprising in the late 1950s, during which India granted asylum to the Dalai Lama, and the subsequent Sino-Indian War, are early examples of a tension that has recently been exacerbated by water disputes. As climate change continues to place stress on the local environment, the critical water supply trapped in the Tibetan Plateau will become a more urgent security matter with a probability of both internal mass incidents and international conflicts in the region.

Sino-Indian tensions have never fully receded from India's 1959 adoption of the "Forward Policy," which placed Indian troops in outposts in contested regions claimed by both India and China. Chinese studies of the incident indicate they believe India was planning a military action in Tibet. However, neutral observers believe these assumptions to be fundamentally flawed.<sup>42</sup> Similar misperceptions by India regarding Mao Zedong's leadership and Chinese nationalism led to severe errors.<sup>43</sup> The Sino-Indian War of 1962, which was fought over the disputed border region in the Himalayas, failed to adequately solve the geographic and political disputes between the two countries. The border dispute continues, with India in control of Arunachal Pradesh and the Chinese in control of Aksai Chin.<sup>44</sup> The region is a tinderbox for conflict and a water resource

## WATER WARS IN THE MIDDLE KINGDOM

grab between the world's two most populous countries may provide the catalyst that triggers a broader conflict.

### India, China Disputed Borders



**Figure 2:** Map of Territory Contested by China and India<sup>45</sup>

China currently has numerous projects under construction or consideration that may trigger international conflict. As Brahma Chellaney states:

China is now pursuing major interbasin and interrivers water transfer projects on the Tibetan plateau that threaten to diminish international river flows into India and other co-riparian states. The most dangerous idea China is toying with is the northward rerouting of the Brahmaputra ... a project China rarely discusses in public, because the project implies environmental devastation of

India's northeastern plains and eastern Bangladesh, and would thus be akin to a declaration of water war on India and Bangladesh.<sup>46</sup>

India should be mindful of China's broader strategy, and China needs to realize that it is not immune from regional or global responses. If China attempts to monopolize the Himalayan watershed, India will respond, and if India continues its military modernization, it may be capable of striking China. A recent report on India's expanding capabilities asserts, "India is currently the world's largest importer of weapons; it has crossed China in terms of defence spending between 2006 and 2010."<sup>47</sup> Historical tension, a mutual dependence on shared water resources, and powerful regional rivalries make this new Great Game a global concern.

In April 2013, approximately 50 Chinese soldiers crossed the Line of Actual Control (LAC) and created a camp inside India.<sup>48</sup> The three-week long standoff was resolved peacefully, but in response India decided to create a mountain strike force of 40,000 to 50,000 soldiers.<sup>49, 50</sup> In July and August 2013 more than a dozen reports of Chinese soldiers crossing the LAC were filed. Additional reports assert that Chinese military forces have gradually occupied 640 square kilometers of Indian Territory.<sup>51</sup> The continued tension underscores the hostilities in the region and the potential for the militarization of the border.

Such militarization could in turn lead to a regional arms race. India and China both have strategic military reasons for wanting control of the region. Despite the history of regional tension, relations appear to be normalizing, and in late October 2013 the two countries signed an agreement that outlined new policies to minimize the chance of a conflict. The deal stipulates that, "the two sides will give notice of patrols along the ill-defined border to ensure that patrols do not 'tail' each other to reduce the chance of confrontation and will exercise 'maximum self-restraint' should the two sides come face to face in areas where the line of control is unclear."<sup>52</sup> The countries should strengthen the recent border defense agreement by holding joint military exercises and deepening the cross-border relations between the militaries.<sup>53</sup> While both countries desire control of the region, both have much more to gain from regional peace,

de-escalation of tensions, and the avoidance of an arms race. However, disputes between the riparian countries in the Himalayan watershed over water management could still ignite existing tensions with lethal consequences.

Politically, India and China have been trying to accommodate each other's rise. Indian Prime Minister Manmohan Singh stated, "the world is large enough to accommodate the growth ambitions of both India and China."<sup>54</sup> The two countries have carried out joint military exercises, and India even allocated part of its defense budget in 2003 to aid in combating China's outbreak of severe acute respiratory syndrome (SARS).<sup>55</sup> The volume of trade between the two countries has increased, benefiting both economies, and the countries are cooperating on climate change issues at international forums.<sup>56</sup> However, the ongoing tension surrounding the border issues constantly limits the amount of progress that the two countries can make. Water issues are a prominent source of tension in the border region, and until the border issue is resolved these tensions will impede a larger framework for peace and cooperation.

Arunachal Citizens' Right, a civil society organization in India, expressed "grave concern [over] the unilateral decision of the Government of India to impose large storage dam projects on Subansiri, Siang and Lohit river basins, the tributaries of Brahmaputra, as a strategy to counter China's proposed dam building on Tsangpo."<sup>57</sup> China currently has regional advantage militarily<sup>58</sup> and economically<sup>59</sup> and the ongoing border dispute may play into China's larger strategy. Mohan Malik reports:

Some in China view the unresolved border dispute as working in Beijing's favor. China's aggressive patrolling along the unsettled border keeps India's military forces tied down on multiple fronts, tests Delhi's resolve, heightens its anxiety, exposes its strategic vulnerabilities and diverts scarce resources away from its naval modernization.<sup>60</sup>

Despite India's efforts, it appears that until New Delhi can offer something to Beijing, or pose a credible threat, a larger peace between the two

countries will remain elusive. China is using the border issue as part of its larger international strategy to gain leverage over India and apply both military and diplomatic pressure.<sup>61</sup> The border disputes will seem relatively small if China dams and restricts the water flow to its downstream neighbors.

It is unlikely, however, that China is willing to go to war over the border dispute or the region's water. It has been content with the border arrangement for decades and a war to control water in the region may be costly. Furthermore, infrastructure used to secure and transport the water, such as dams and pipelines, would be easy military targets for retaliation strikes. Rather, Beijing appears to be maximizing its leverage in preparation for a future agreement on the border and water issues. Keeping military and diplomatic pressure on India now will give Beijing more room to maneuver in negotiations later. Beijing, however, must also contend with the growing domestic concern over its environmental and water policies.

### **Policy Prescriptions: International**

China's actions are likely guided by the simultaneous desire to avoid a war with India while asserting its growing dominance in the region. In the short-term, China may wish to keep India preparing for a multi-front war in the Indian Ocean and in the Himalayas. If India falls into this trap—and it seems as though it is, judging from its military modernization and strategic studies—China will be able to divert India's funds from economic development to military uses.<sup>62</sup> By forcing India's strategy in this way, China will be able to continue to outpace India economically. India's defense budget has grown to \$46.8 billion, making it the seventh largest military spender, and, although India's economy has grown rapidly, it faces a severe lack of infrastructure.<sup>63</sup> The World Bank estimates New Delhi needs to increase its spending on infrastructure by three to four percent of its GDP to maintain its growth rate.<sup>64</sup> India faces a difficult strategic decision, but increased pressure by China on India's border and at sea means that India will need to make a significant strategic shift if it is going to focus on economic development. India has already

begun a military modernization plan, and its preoccupation with Pakistan makes it likely that India will continue on this course instead of shifting resources to focus on economic growth. Although China's hardline tactics with India appear to be working, China should consider the threat India poses. China already faces an insurgency in Xinjiang and its brutal counterinsurgency tactics in the area have inspired a strong internet campaign against Beijing.<sup>65</sup> Chinese think tanks already accuse India of supporting the insurgency in Tibet, although substantive evidence appears lacking.<sup>66</sup> India could choose to support the uprisings and fuel instability in China, especially through cyber operations, which are notoriously difficult to track.

India may be able to develop its military sufficiently to thwart a Chinese attack in either the Himalayas or the South Indian Sea, or both. India is rapidly expanding and modernizing its military through acquisitions and the development of a domestic security industry.<sup>67</sup> New Delhi is preparing for the potential of a conflict with China and has stated that it needs to prepare for a two front war.<sup>68</sup> Or, if India adopts a more aggressive posture, New Delhi may be able to strike offensively on one front and fight a defensive war on the other. For example, India may build up its naval capabilities and fortify the Himalayan border, allowing India to strike a blow to China's offensive naval capabilities while risking little in the mountainous Himalayas. In the short-term it makes sense for China to continue to keep India off balance with the ongoing border issue, forcing India to prepare for conflict on multiple fronts. However, adopting this as a long-term strategy increases the risk of conflict. Assuming China wants to avoid a war with India, the long-term strategy must focus on reconciliation of the border issue. First, China and India need to keep an open dialogue to prevent unwanted flare-ups and misunderstandings. To assist with this, the two countries' militaries should participate in regional joint operations. Thus, in the event of an incident, the mutually built up trust may be used to avoid any escalation of the conflict.

Open communications will also increase the dialogue and trust between the two nations. Such trust is necessary if the two neighbors seek to have productive talks over the border region and the damming in the Tibetan

Plateau. A starting point in the border dispute discussion must be the complete exchange of maps that depict where each country believes the border lies. To date, maps have only been exchanged in one of the three border sections under dispute, although each side has shown the other maps of a second section.<sup>69</sup> As a symbol of good faith, and to serve as a practical starting point, the two nations must have a full exchange of maps to understand the other side's desires and to determine exactly where the disagreement lies. Once this is accomplished, the two sides should discuss where the LAC lies before further negotiations begin.

The LAC is not mutually agreed upon, it is not marked on any map jointly approved by Beijing and New Delhi, and it is not marked on the ground. Thus, the exact location of the line is misunderstood. "The Chinese Government's stated position is that it is the line between the positions held by the forces of the two countries as on 7<sup>th</sup> November 1959. The Indian position is that China has not defined the LAC yet."<sup>70</sup> The countries should begin with areas where agreements may be easily reached to prove that they can progress and to show good faith in the negotiations.

China and India have expanded economic ties and cross-border trade. Further developing this relationship and freeing trade may improve bilateral relations by bringing them closer with a shared interest. Mutually beneficial relationships may increase riparian cooperation or at least prevent any antagonistic actions. However, China and India have already expanded their economic ties, yet significant tensions remain. Growing cooperation is not a panacea for the border dispute, but it may serve to keep tensions in check when border negotiations become contentious. If the countries have a holistic approach to relations, progress in the border dispute should provide good will to start discussions on damming and the use of water in the Himalayan watershed.

### **Policy Prescriptions: Domestic**

Domestically, China's government has taken numerous steps to limit water demand and to curb environmental degradation. However, the rate of environmental destruction has outpaced Beijing's efforts. The most

significant challenge to alleviating China's domestic problems is the lack of good governance. China's environmental regulations are spread out over a variety of agencies. Although it gained power when it became a formal ministry, the central authority for enforcing the environmental protection laws, the Ministry of Environmental Protection (MEP), is underfunded and understaffed. Additionally, the careers of the regional officials are tied to economic measures, creating an incentive for economic performance, not sustainability.<sup>71</sup>

China can combat its environmental security problems to a large extent by enforcing the laws it already has on the books, including Article 9 of the Constitution of the People's Republic of China, which states, "no organization or individual can appropriate or damage any natural resource."<sup>72</sup> Enforcement of this measure will be challenging and will require a significant change in governance and an increase in both the manpower and funding of the MEP. The MEP will have to be given broad authority to manage at the macro level—to develop and institute national policy—and at the micro level—to explain and enforce policies in local and regional governments. The institutional structure will have to change in order to more effectively coordinate national level goals and institute them on a regional basis. Without the proper authority and resources, the MEP is incapable of enforcing the existing laws, and the lack of coordination between the various law enforcement agencies makes the system ineffective. Bottom-up initiatives that allow the Chinese citizenship to actively participate in the system should also be instituted.

Additionally, public interest litigation should be adopted to allow citizens to bring violating government entities to court. As Guizhen He et al. state:

Adequate rules for punishment must be set up and enforced to penalize those who violate the law—administrators, regulators, and regulated parties alike, e.g., through double punishment (punish the violating company and its owner), a daily penalty for continuous environmental violations, and avoiding low penalties. To align with litigation laws, the revised EPL [Environmental Protection Law] should adopt public interest litigation and grant any public

entity or citizen the right to bring violating administrative departments and other entities to court.<sup>73</sup>

Furthermore, the basis on which regional government and law enforcement officials are evaluated needs to reflect China's growing environmental security problem alongside Beijing's policies. Until incentives align with the environmental policies, little progress is likely to occur. Simply passing additional laws is not an effective strategy. China should make a conscious choice to reprioritize the environment and economy and should shift its priority from economic growth toward addressing environmental security issues.

In addition to litigation changes, Beijing needs to address the large population of environmental migrants forced to leave their homes as China constructs more dams. Although the dams provide a greatly needed source of energy, the large migrant population poses an internal security risk to China and will contribute to the pattern of increasing mass incidents. This is another instance where better governance can contribute greatly to solving the problem. First, China should lift the domestic job ban aimed at migrants. Doing so will give many of the country's internally displaced persons the opportunity to be as economically productive as possible. It will also prevent animosity felt toward the government as a result of decreased livelihood, and thus increase stability. The government should also make efforts to keep family units together and to assist in finding equitable work. Assisting its citizens in such a way will help the government generate goodwill in the populace and decrease resentment directed at Beijing and its aggressive dam-building policies.

China can and should continue its economic growth, but at a pace where it can manage the increasing demands on the water supply and environment. Managing economic growth will decrease the demand for energy and slow the demand on the water-intensive agricultural system. Additionally, China should shift its economy to one focused on sustainable development. The economic cost to China of poor environmental practices is estimated to be between two-and-a-half<sup>74</sup> and nine percent<sup>75</sup> of its economic productivity (GDP and GNI respectively), as previously

discussed. China can use the economic shift to address the grievances of the people as expressed by the increasing number of mass incidents.

China's agricultural sector represents an area where significant progress can be made to decrease the strain on the country's water supply. In part because of a rising middle class, there has been a greater demand for grain-intensive meats such as chicken, pork, and beef. Poor irrigation and farming techniques, added to the increased demand for meat, have led to contaminated water being used for irrigation.<sup>76</sup> Nearly 25 million acres of cultivated land are polluted from the use of wastewater for irrigation and 328,000 acres have been ruined by solid waste.<sup>77</sup>

The use of contaminated water for agriculture is symptomatic of the larger water and environmental security problems in China. Significant improvements in China's agricultural efficiency can be made by improving the water transport infrastructure, updating farmers' irrigation techniques, and using perennial grains. Australian farmers, for example, increased rice crop yields by 60% while reducing water use by 30% through a combination of soil optimization, "ponding," planting multiple crops to maximize water use, and land leveling.<sup>78</sup> Similar measures can make a significant impact on China's water demand. Although the policy prescriptions enumerated here are complex and challenging, they are nevertheless achievable.

Reconciling the challenges along the Tibetan Plateau requires the creation of realistic and moderate long-term strategies not only on China's side, but also on India's. Past grievances have and may continue to limit progress toward a mutual agreement. Leadership on both sides must be willing to look to the future in order to formally agree upon border issues, address the dependence of all riparian states, and account for the regional effects of damming. Short-term politics may predominate the thinking in China, but as India's military continues to expand and poses a more legitimate threat, Beijing should consider India's long-term intentions. Naysayers will emphasize that, though economic ties between the countries have strengthened, tensions nevertheless remain. The suggestions presented above do not dispute that tensions still exist. Rather, they call for both

parties to build upon these relations, which will allow each country to take a small step down the long road toward a border agreement.

Domestically, the policy prescriptions outlined above rely on the assumption that Beijing will be willing to look past short-term economic gains for long-term stability. Even if the central government is willing, there is no guarantee that this message will be communicated well to the Chinese people or that the masses will be receptive if such efforts are made. Short-term losses will occur, and these will almost certainly lead to protests, increasing political pressure on Beijing to restore high economic growth rates. This paper does not however, call for the creation of sweeping legislation, but rather the enforcement of legislation that already exists. Furthermore, increasing protests from any downturn the economy takes may be offset by a decrease in environmental protests, as Beijing addresses their grievances. Increasing the staffing and funding of the MEP will be difficult. Empowering the MEP to not only formulate national strategy, but also to enforce the law both regionally and locally by coordinating law enforcement, will take time and effort.

The Chinese political power structure is focused on economic growth, and it has achieved this in resounding fashion. Shifting the system to increasingly value environmental concerns will require strong and unified leadership. However, evidence of this shift is already promising; ten ministries, including the MEP, issued the “Work Plan on Implementing Assessment of the Most Stringent Water Management System” in February 2014. The Work Plan states that provinces with high performance will be rewarded, while those that fail will need to report to the State Council and face corrective measures.<sup>79</sup> China already has a host of laws regarding environmental degradation, and how this will be enforced remains to be seen, but tying political assessment to the environment is a step in the right direction. Indeed, Beijing needs to factor in economic concerns, but if the growing environmental problems are not addressed forcefully, mass incidents, social unrest, and the economic impacts will only be worse. It is not a matter of if Beijing addresses the issue, but when.

Unless China takes action, the water security situation will continue to deteriorate, mass incidents will grow in number, violence due to the linkage of the water crises with regional insurgencies will increase, and environmental issues will continue to have a significant impact on China's economy. Taking action not only makes sense from a security perspective, but also from an economic perspective.

### **Conclusion**

Environmental degradation has reached a critical level in China. An estimated 70% of China's rivers are contaminated.<sup>80</sup> Reaching the fresh water that is available is becoming increasingly difficult, as evidenced by the need to dig wells several times deeper than required just a few years ago. The demand for water is expanding as a result of the growing economy, increased energy demand, and an emerging middle class. The demand problem is compounded by the contamination of China's fresh water by industrial use. China's rapid economic expansion fueled a great deal of the demand growth and industrial pollution. Although Beijing has taken steps to alleviate problems, corrective measures are plagued by ineffective environmental governance and an underfunded Ministry of Environmental Protection. China has turned to the Tibetan Plateau as an answer to its internal water security problems, but taking action in this region risks enflaming neighboring countries. Tensions with India over the border dispute are already high, and damming in the region may trigger a deadly water race to control the remaining rivers.

China has to balance a number of critical issues both domestically and internationally. Domestically, the country must contend with a growing instability and an increasing number of mass incidents. A shift in China's policies from solely focusing on economic growth to incorporating environmental security is essential if China is to make the necessary changes. Beijing needs to empower the MEP to enforce the laws and punish those that break the law, thus creating an effective deterrent and mitigating the polluting industrial practices. Internationally, China's long-term strategy should focus on resolving the border issue with India and pursuing cooperation in the Himalayan region. China and India can

and should concentrate on aspects upon which they agree, while strengthening their economic ties with one another. These efforts may provide enough goodwill to support negotiations on the contentious issues surrounding the border dispute and water use in the region. The challenges facing China are numerous, but not insurmountable. Beijing should take action now, when it can control the transformation necessary to create a stable and peaceful future.

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