

# AN ENVIRONMENTAL IMPACT ASSESSMENT FOR HYDROPOWER DEVELOPMENT IN CHINA

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## INTRODUCTION

Welcome to Beijing, 2012. Luxury malls abound, popping up in threes. The iPhone 4, iPad, and other electronic gadgets are ever-present on subways, in coffee shops, and on university campuses. Bicycle lanes are no longer jammed full with rush hour bicycle traffic. Instead, the ring roads

that circle the city have become parking lots during the morning and evening commutes as a result of the drastic rise in personal vehicle ownership in recent years.<sup>1</sup> Prior to 2007, Beijing had only four subway lines; by 2010, the city boasted a comprehensive public transportation system with fourteen lines.<sup>2</sup> Paralleling this growth is the demand for such consumer goods as cars, refrigerators, washing machines, air conditioners, microwaves, and televisions.<sup>3</sup> China's urban population, particularly the younger generation, is striving to achieve what many in the United States have already successfully achieved: a comfortable standard of living with a relatively unlimited ability to obtain possessions. The problem is that these consumer goods use energy, and in China, the primary source of energy is coal.<sup>4</sup> While personal energy consumption accounted for only twenty-nine percent of China's total energy demand in 2005, and industry accounted for seventy-one percent,<sup>5</sup> at its root, China's industrial growth is driven by a demand for consumer goods, from both domestic and international markets. Demand for consumer goods has put a strain on China's energy resources, both directly and indirectly, and challenged the government's ability to meet the country's ever-growing energy needs with coal. In response, the Chinese

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1. In the ten years between 1995 and 2005, the number of vehicles in China rose from ten million to 100 million. Thirty percent of this increase has been attributed to personal vehicle ownership. Edward H. Ziegler, *China's Cities, Globalization, and Sustainable Development: Comparative Thoughts on Urban Planning, Energy, and Environmental Policy*, 5 WASH. U. GLOB. STUD. L. REV. 295, 306 (2006). As early as 2007, Beijing was adding up to 1,200 new vehicles to the road each day. Jim Yardley, *Beijing's Olympic Quest: Turn Smoggy Sky Blue*, N.Y. TIMES, Dec. 29, 2007, <http://www.nytimes.com/2007/12/29/world/asia/29china.html?ref=asia>.

2. Beijing Subway Development, China, China, RAILWAY TECHNOLOGY, [http://www.railway-technology.com/projects/beijing\\_subway/#.UKfTdH4u1qk.email](http://www.railway-technology.com/projects/beijing_subway/#.UKfTdH4u1qk.email) (last visited Nov. 17, 2012).

3. Philip H. Brown, et al., *Socioeconomic Vulnerability in China's Hydropower Development*, 19 CHINA ECONOMIC REVIEW 614, 615 (2008).

4. CHINA GREENTECH INITIATIVE, THE CHINA GREENTECH REPORT™ 2011: CHINA'S EMERGENCE AS A GLOBAL GREENTECH MARKET LEADER 37 (2011).

5. Brown, *supra* note 3.

government has made ambitious commitments both to reduce energy consumption and to develop renewable energy sources, including wind, solar, nuclear, and hydropower.<sup>6</sup>

This paper focuses on large-scale hydropower development on the transboundary Lancang-Mekong and Nu-Salween Rivers as one piece of China's comprehensive energy reform strategy. In particular, this paper seeks to analyze the ability of China's domestic legal mechanisms to address the impacts of this development by looking at how China's Environmental Impact Assessment Law (EIA Law) has been implemented in the context of large-scale hydropower development. Part I describes the costs associated with China's current dependence on coal as a primary energy source and will introduce the government's renewable energy development objectives, including those related to hydropower. Part I also discusses the current hydropower development plans for the Lancang-Mekong and Nu-Salween Rivers and why these transboundary rivers are ripe for development. Although it is beyond the scope of this paper to perform a full cost-benefit analysis, Part II describes and analyzes some of the social and environmental costs and benefits of utilizing hydropower as an alternative source of energy. Part III examines the effectiveness of China's EIA Law and related regulations in the context of hydropower development. It assesses whether and how these laws and regulations have been utilized in the process of siting and approving hydropower projects through a case study involving the Jinsha (upper Yangtze) River, Xiaonanhai, where the Ministry of Environmental Protection (MEP) approved a boundary change to a rare and endemic fish nature reserve to make way for dam construction.<sup>7</sup> Part III also evaluates whether or not the newly promulgated Regulations on the Environmental Impact Assessment of Planning (PIA Regulations) will have a positive effect on the EIA process. In recognition of the fact that a successful domestic EIA mechanism may not be adequate to address the concerns of downstream riparian states, Part IV briefly examines the growing use of international legal mechanisms to assess the transboundary impacts of development projects. Part V offers recommendations for strengthening the implementation of China's domestic EIA Law in the hydropower context.

This paper concludes that the central government should continue to strengthen implementation of the domestic EIA Law in the hydropower

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6. CHINA GREENTECH INITIATIVE, *supra* note 4, at 25–26.

7. Interview with Chang Cheng, Pub. Participation and Info. Disclosure Program, Friends of Nature, in Beijing, China (Mar. 21, 2012).

context if it is going to continue to pursue hydropower development as part of a comprehensive energy reform strategy. The EIA Law can be strengthened by ensuring public participation in the hydropower decision-making process, removing government bias in the EIA review process, and creating meaningful consequences for non-compliance with EIA requirements. To address international concerns, the central government should also consider engaging in cooperation with downstream riparian states to create a legal mechanism for the assessment of the transboundary environmental impacts of its domestic hydropower development projects.

## I. CHINA'S ENERGY POLICY AND HYDROPOWER

### A. *The Cost of Coal and China's Renewable Energy Objectives*

In a city like Beijing, the negative environmental consequences of rapid growth and coal dependence are not some future hypothetical that can be disputed by disbelievers. Instead, the consequences are tangible and real, as exhibited by the frighteningly poor air quality in Beijing. Despite claims by the Beijing Environmental Protection Bureau (EPB) that the city reached its target of 274 “blue sky days” in 2011,<sup>8</sup> it is unclear whether this was due to an actual improvement in air quality or to the city's methods of measuring air quality.<sup>9</sup> For example, Beijing measures the air concentration level of PM10, rather than PM2.5, a more harmful particulate matter (although the MEP announced in early 2012 its intention to implement a system for monitoring PM2.5 nationally by 2016).<sup>10</sup> Wang Yuesi, a researcher with the Chinese Academy of Sciences, estimated that if Beijing were to use an air quality standard that measures the concentration level of PM2.5 in addition to PM10, the number of “blue sky days” would decrease by twenty to thirty percent.<sup>11</sup> The United States Embassy in Beijing also monitors the city's air

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8. *Beijing Reaches Annual 'Blue Sky Days' Target*, CHINA DAILY, Dec. 19, 2011, [http://www.chinadaily.com.cn/bizchina/2011-12/19/content\\_14284925.htm](http://www.chinadaily.com.cn/bizchina/2011-12/19/content_14284925.htm). The city of Beijing measures the level of air pollutants using a scale from 1 to 500, with 500 indicating the most heavily polluted air. Any day that rates below 101 is recorded as a “blue sky day.” In 1998, Beijing saw only 100 “blue sky days”; by 2007, that number reached 246. Jim Yardley, *Consultant Questions Beijing's Claim of Cleaner Air*, N.Y. TIMES, Jan. 10, 2008, <http://www.nytimes.com/2008/01/10/world/asia/10china.html>.

9. Yardley, *supra* note 8.

10. *Air Standards Going National by 2016*, CHINA DAILY, Mar. 3, 2012, [http://www.chinadaily.com.cn/bizchina/2012-03/03/content\\_14747541.htm](http://www.chinadaily.com.cn/bizchina/2012-03/03/content_14747541.htm).

11. *Expert: Beijing's PM2.5 Air Pollution Getting Worse*, PEOPLE'S DAILY ONLINE, Dec. 12, 2011, <http://english.peopledaily.com.cn/90882/7673433.html>.

quality, measuring PM2.5 on its Air Quality Index (AQI).<sup>12</sup> Under this standard, the pollution was so dire in early December of 2011 that it exceeded the U.S. Embassy's maximum rating of 500.<sup>13</sup> The air quality was so poor that hundreds of flights into and out of the Beijing Capital International Airport were canceled for several days.<sup>14</sup>

In reality, one need not rely on an air quality assessment to comprehend the gravity of the situation in Beijing. On the best of days, it is difficult to breathe. On the worst of days, the sun is barely visible through the thick haze that envelops the city and obscures nearby buildings. Not surprisingly, lung cancer is the most prevalent form of cancer in China today, with incidents increasing by approximately 500% since the 1970s.<sup>15</sup> Also unsurprising is that pulmonary disease ranks the second highest cause of adult deaths in China.<sup>16</sup> The visibly poor air quality is a daily reminder of the environmental cost of unsustainable growth and development paired with unsustainable consumption.

The primary reason for the poor air quality in China's major cities is China's reliance on coal as an energy source. Seventy percent of China's total energy demand is currently satisfied by coal,<sup>17</sup> and according to China Greentech Initiative's China Greentech Report 2011, "[c]oal power plants are the undisputed leading cause of air pollution in China."<sup>18</sup> In addition to the air pollution caused by coal power plants, air pollution also occurs during coal transport. Approximately sixty million tons of coal dust particulate matter are deposited each year along transport routes between

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12. *U.S. Embassy Beijing Air Quality Monitor*, EMBASSY OF THE UNITED STATES BEIJING, CHINA, <http://beijing.usembassy-china.org.cn/070109air.html> (last visited May 3, 2012). Similar to the Beijing EPB's monitoring system, the U.S. Air Quality Index ranks air quality on a scale of 0 to 500, with 301 to 500 classified as "hazardous." *Air Quality Index (AQI)*, EMBASSY OF THE UNITED STATES BEIJING, CHINA, <http://beijing.usembassy-china.org.cn/070109air.html> (follow "For the Air Quality Index Guide, please click here" hyperlink) (last visited May 3, 2012). The United States Embassy in Beijing provides hourly updates on Twitter regarding the air quality risk level. *BeijingAir*, EMBASSY OF THE UNITED STATES BEIJING, CHINA, <http://twitter.com/beijingair> (last visited May 3, 2012).

13. Edward Wong, *Outrage Grows Over Air Pollution and China's Response*, N.Y. TIMES, Dec. 6, 2011, <http://www.nytimes.com/2011/12/07/world/asia/beijing-journal-anger-grows-over-air-pollution-in-china.html>.

14. *Id.*

15. Janet Larsen, *Plan B Updates: Cancer Now Leading Cause of Death in China*, EARTH POLICY INSTITUTE (May 25, 2011), [http://www.earth-policy.org/plan\\_b\\_updates/2011/update96](http://www.earth-policy.org/plan_b_updates/2011/update96).

16. GREENPEACE, *THE TRUE COST OF COAL* 43 (2008). Although some may attribute the rise in lung cancer and other respiratory diseases to smoking, the rate of smoking in Beijing has remained constant for the past decade, while lung cancer rates have increased by sixty percent. Wong, *supra* note 13.

17. CHINA GREENTECH INITIATIVE, *supra* note 4.

18. *Id.*

mining regions and power plants.<sup>19</sup> Particulate matter has an adverse impact on human health, and it contaminates water and damages crops.<sup>20</sup>

Coal's contribution to declining air quality is just one of the many reasons China needs to reevaluate its dependence on coal as a primary energy source. Coal also has significant social costs. For example, mining disasters in China claim the lives of an average of nine miners daily,<sup>21</sup> and approximately 600,000 coal miners in China suffer from chronic (and often fatal) black lung disease each year.<sup>22</sup> Finally, domestic coal reserves are limited, and weather conditions often delay coal transport.<sup>23</sup> For all of these reasons, coal is not a safe, reliable, long-term source of energy for China.

In recognition of these circumstances, the Chinese central government has begun exploring alternative sources of energy, including wind, solar, nuclear, hydropower, natural gas, and clean coal technology. In March 2011, the National People's Congress released a proposal for the 12th Five-Year Plan for the National Economic and Social Development of the People's Republic of China (12th Five-Year Plan).<sup>24</sup> Accelerated development of renewable energy sources is a compulsory objective in the 12th Five-Year Plan.<sup>25</sup> Other compulsory objectives related to energy production and consumption include reducing China's per-unit GDP carbon dioxide emissions by seventeen percent,<sup>26</sup> reducing per-unit GDP energy consumption by sixteen percent,<sup>27</sup> and increasing non-fossil energy source consumption to 11.4 percent of the country's total energy consumption.<sup>28</sup> The plan calls for all objectives to be met by 2015.<sup>29</sup>

One way the Chinese government hopes to meet these objectives is through the development of hydropower resources. Large-scale hydropower development is a relatively modern phenomenon in China. Before the rise of the Chinese Communist Party in 1949, the entire country had only twenty-three dams, not including small-scale, private dams used for

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19. GREENPEACE, *supra* note 16, at 39.

20. *Id.*

21. Sharon LaFraniere, *Graft in China Covers Up Toll of Coal Mines*, N.Y. TIMES, April 10, 2009, [http://www.nytimes.com/2009/04/11/world/asia/11coal.html?\\_r=2](http://www.nytimes.com/2009/04/11/world/asia/11coal.html?_r=2).

22. GREENPEACE, *supra* note 16, at 33.

23. Brown, *supra* note 3.

24. INFO. OFFICE OF THE STATE COUNCIL, CHINA'S POLICIES AND ACTIONS FOR ADDRESSING CLIMATE CHANGE (2011), *available at* [http://www.gov.cn/english/official/2011-11/22/content\\_2000272.htm](http://www.gov.cn/english/official/2011-11/22/content_2000272.htm).

25. *Id.*

26. *Id.*

27. *Id.*

28. *Id.*

29. *Id.*

irrigation.<sup>30</sup> Today, China has approximately 85,000 dams, including 22,000 of the world's 45,000 dams measuring more than fifteen meters in height.<sup>31</sup> China also holds many records related to hydropower. For instance, "China has the greatest hydropower potential of any country on Earth, with an estimated total capacity of approximately 380,000 megawatts (MW)."<sup>32</sup> China also has the largest overall dam reservoir capacity<sup>33</sup> and boasts the dam with the highest ship lift.<sup>34</sup> The Three Gorges Dam on the Yangtze River provides hydropower for the world's largest hydroelectric station, with an installed capacity equivalent to approximately fifteen large nuclear power plants.<sup>35</sup> And the Xiaowan dam on the Lancang-Mekong River, completed in August 2010,<sup>36</sup> is the world's highest arch dam, standing at 292 meters.<sup>37</sup> China's embrace of hydropower as a source of energy is hardly surprising given that "China's energy development is based on the principle of relying on domestic resources."<sup>38</sup>

#### *B. Hydropower Development on the Lancang-Mekong and Nu-Salween Rivers*

The Chinese government recently turned its attention to the relatively untapped hydroenergy-rich rivers in the southwest province of Yunnan, including the Lancang-Mekong and Nu-Salween. The source of the Lancang-Mekong River is at an elevation of 5,224 meters<sup>39</sup> in the Tanggula Mountain Range on the Qinghai-Tibet Plateau.<sup>40</sup> The source of the Nu-Salween River is at an elevation of approximately 5,000 meters on the Qinghai-Tibet Plateau.<sup>41</sup> After departing China, the Lancang-Mekong flows

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30. PETER NAVARRO, *THE COMING CHINA WARS: WHERE THEY WILL BE FOUGHT AND HOW THEY CAN BE WON* 129 (2007).

31. *Id.*

32. Brown, *supra* note 3, at 619.

33. NAVARRO, *supra* note 30, at 130.

34. *Id.*

35. *Id.* at 134.

36. *China Becomes Hydro Superpower*, CHINA DAILY, Aug. 26, 2010, [http://www.chinadaily.com.cn/business/2010-08/26/content\\_11204360.htm](http://www.chinadaily.com.cn/business/2010-08/26/content_11204360.htm).

37. Darrin Magee, *Powershed Politics: Yunnan Hydropower Under Great Western Development*, 185 THE CHINA Q. 23, 30 (2006).

38. INFO. OFFICE OF THE STATE COUNCIL, CHINA'S ENERGY CONDITIONS AND POLICIES (2007), available at <http://www.china.org.cn/english/whitepaper/energy/237114.htm>.

39. EXPLORING THE MOTHER OF WATERS (The Mekong Descent Foundation 2006).

40. COUNTRY REPORT ON CHINA'S PARTICIPATION IN GREATER MEKONG SUBREGION COOPERATION (2008), available at <http://www.fmprc.gov.cn/eng/zxxx/t419062.htm>.

41. Darrin Magee & Shawn Kelley, *Damming the Salween River*, CONTESTED WATERSCAPES IN THE MEKONG REGION: HYDROPOWER, LIVELIHOODS AND GOVERNANCE 116 (François Molle, et. al. eds., 2009).

through parts of Burma, Laos, Thailand, Cambodia, and Vietnam;<sup>42</sup> and the Nu-Salween flows through Burma.<sup>43</sup> While in China, both the Lancang-Mekong and Nu-Salween, together with the Jinsha (upper Yangtze) River, flow parallel through a 1.7 million hectare protected area in Yunnan Province called the Three Parallel Rivers of Yunnan Protected Areas.<sup>44</sup> This area was designated a UNESCO World Heritage site in 2003 because of its deep scenic river gorges, geological history, and rich biodiversity.<sup>45</sup> The region's characteristic deep river gorges also give it the second highest exploitable hydropower potential in the world.<sup>46</sup> In China alone, the Lancang-Mekong River drops 5,000 meters in elevation, which accounts for a significant percent of the river basin's total elevation drop and is a major factor in the river's hydropower potential.<sup>47</sup> The Chinese government has pursued plans to construct cascades of hydropower stations along each of these rivers. The planned cascades include an eight-dam cascade on the Lancang-Mekong River<sup>48</sup> and a thirteen-dam cascade on the Nu-Salween River.<sup>49</sup>

The eight-dam cascade planned for the Lancang-Mekong River includes the following hydropower stations: Gongguoqiao, Xiaowan, Manwan, Dachaoshan, Nuozhadu, Jinghong, Ganlanba, and Meng Song.<sup>50</sup> The Manwan hydropower station, completed in 1995, has a total installed capacity of 1,500 MW.<sup>51</sup> Dachaoshan was built between 1997 and 2003, with a total installed capacity of 1,350 MW; Jinghong between 2004 and 2009, with a total installed capacity of 1,750 MW; and Xiaowan between 2002 and 2010, with a total installed capacity of 4,200 MW.<sup>52</sup> Construction

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42. *The Mekong Basin*, MEKONG RIVER COMMISSION, <http://www.mrcmekong.org/the-mekong-basin> (last visited May 3, 2012).

43. Magee, *supra* note 41.

44. *Three Parallel Rivers of Yunnan Protected Areas*, UNESCO.ORG., <http://whc.unesco.org/en/list/1083> (last visited May 3, 2012).

45. *Id.*

46. EVELYN GOH, DEVELOPING THE MEKONG: REGIONALISM AND REGIONAL SECURITY IN CHINA-SOUTHEAST ASIAN RELATIONS 21 (2007).

47. Magee, *supra* note 37, at 28–29.

48. Zhong Huaping (钟华平) & Wang Jiansheng (王建生), *Lancang Jiang Ganliu Shuidian Kaifa dui Jingliu de Yingxiang Fenxi* (澜沧江干流水电开发对径流的影响分析) [*Impacts from Hydropower Development of Mainstream on Runoff of Lancangjiang River*], 41(12) SHULI SHUIDIAN JISHU (水利水电技术) [WATER RESOURCES AND HYDROPOWER ENGINEERING] 72, 72 (2010).

49. Brown, *supra* note 3, at 620.

50. Zhong, *supra* note 48.

51. Magee, *supra* note 37, at 32.

52. *Id.* When *Powershed Politics* was published in 2006, it was estimated that the Xiaowan hydropower station would be completed by 2012. However, Xiaowan was completed ahead of schedule, in August of 2010. *China Becomes Hydro Superpower*, *supra* note 36.

commenced on Nuozhadu in 2005 and is scheduled for completion by 2017, with a total installed capacity of 5,850 MW.<sup>53</sup> The Gongguoqiao hydropower station will have an installed capacity of 750 MW.<sup>54</sup> The total capacity for the completed eight stations planned on the Lancang-Mekong River is approximately 20,000 MW.<sup>55</sup>

The thirteen-dam cascade planned for the Nu-Salween River includes the following hydropower stations: Songta, Bingzhongluo, Maji, Lumadeng, Fugong, Bijiang, Yabiluo, Lushui, Liuku, Shitouzhai, Saige, Yansangshu, and Guangpo.<sup>56</sup> Construction commenced on the Liuku hydropower station in 2008, and starting in 2005, some site work has begun on the Songta, Maji, Yabiluo, and Saige hydropower stations.<sup>57</sup> The total capacity predicted for the thirteen completed hydropower stations on the Nu-Salween River is 21,000 MW.<sup>58</sup>

## II. A CRITICAL LOOK AT SOME OF THE COSTS AND BENEFITS OF HYDROPOWER AS A SOURCE OF ENERGY

Given the scale of China's hydropower development plans for the transboundary Lancang-Mekong and Nu-Salween Rivers, it is critical that the negative impacts of these projects be carefully weighed against the benefits. Many environmental organizations working on this issue, including International Rivers and Friends of Nature, question whether China's approach is adequate to accurately assess these impacts.<sup>59</sup> Even though Premier Wen Jiabao suspended construction on the Nu-Salween River cascade in 2004 in response to public objection,<sup>60</sup> it is clear that hydropower development is back on the table as a major component of China's energy future.<sup>61</sup> Whether moving forward with hydropower

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53. Magee, *supra* note 37, at 32.

54. *Id.*

55. *Id.* at 28.

56. Brown, *supra* note 3, at 622.

57. *Id.*

58. Darrin Magee & Kristen McDonald, *Beyond the Three Gorges: Nu River Hydropower and Energy Decision Politics in China*, 25 *ASIAN GEOGRAPHER* 39, 43 (2006).

59. Interview with Chang Cheng, *supra* note 7; Telephone Interview with Katy Yan, China Program Coordinator, and Songqiao Yao, China Program Assistant, International Rivers (Mar. 23, 2012).

60. Magee, *supra* note 41, at 119.

61. According to Circle of Blue, China plans to nearly triple its hydroelectric generating capacity between 2010 and 2020. Keith Schneider, *Choke Point: China—Confronting Water Security and Energy Demand in the World's Largest Country*, CIRCLE OF BLUE (Feb. 15, 2011, 06:00 AM), <http://www.circleofblue.org/waternews/2011/world/choke-point-china%E2%80%94confronting-water-scarcity-and-energy-demand-in-the-world%E2%80%99s-largest-country>.

development on these transboundary rivers is advisable remains highly contested. It is worthwhile to identify some of the primary issues on each side of the debate before examining the effectiveness of China's regulatory regime.

First, it is debatable whether hydropower will help China meet its greenhouse gas emission reduction targets. As discussed above, China currently relies on coal to satisfy seventy percent of its domestic energy demand.<sup>62</sup> As a result, China already produces more CO<sub>2</sub> than any other country and is predicted to be responsible for approximately forty percent of the world's total growth in CO<sub>2</sub> emissions by 2030.<sup>63</sup> Leading up to the 2009 Copenhagen Climate Change Conference, China made significant policy commitments to increase its reliance on renewable energy sources, including hydropower, to reduce greenhouse gas emissions.<sup>64</sup> In China, hydropower already accounts for sixteen percent of the national electricity supply, second in importance only to coal.<sup>65</sup> To put this in perspective, academics claim that if China were to fully develop its plans for twelve separate hydropower bases, "these dams would be sufficient to meet approximately 45% of China's current electricity demand."<sup>66</sup> Because hydropower production creates less greenhouse gas than coal-fired electricity plants, accelerating hydropower development may help China decrease its carbon emissions by reducing China's reliance on coal.<sup>67</sup>

The government's plan to rely on hydropower to reduce carbon and other greenhouse gas emissions is perhaps overly ambitious because it fails to consider the greenhouse gases produced during construction. The World Commission on Dams among others, have demonstrated that, "rotting vegetation submerged when large reservoirs fill release significant quantities of methane into the atmosphere, which is some 20 times more effective as a greenhouse gas than carbon dioxide."<sup>68</sup> Furthermore, the ability to serve as a long-term and stable source of energy is undermined by the accumulation of silt in dam reservoirs<sup>69</sup> and by seasonal fluctuations in

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62. CHINA GREENTECH INITIATIVE, *supra* note 4.

63. Brown, *supra* note 3, at 614.

64. INFO. OFFICE OF THE STATE COUNCIL, *supra* note 24.

65. Brown, *supra* note 3, at 616.

66. *Id.* at 624.

67. *Id.* at 614, 617.

68. *Id.* at 618.

69. *Id.*

rainfall.<sup>70</sup> For example, it has been estimated that the Manwan Dam, the first of the Lancang-Mekong cascade (completed in 1995), has already caused the impoundment of so much sediment that it will only be able to efficiently produce energy for thirty years instead of the originally anticipated 100 years.<sup>71</sup> On the Yangtze River, dozens of smaller dams have already been constructed upstream of the Three Gorges Dam to trap silt and help maintain the Three Gorges' projected capacity.<sup>72</sup> Seasonal fluctuations in rainfall and drought have also impacted the ability of some hydropower stations to meet projected energy production targets.<sup>73</sup> These factors tend to undermine the premise underlying China's energy policy that hydropower is a viable long-term source of energy capable of reducing overall greenhouse gas emissions.

Even if the benefits of hydropower development justify the costs, many of these benefits are primarily enjoyed by relatively wealthy, east-coast urban centers, while a disproportionate share of the costs are imposed on poorer communities in southwest China and downstream communities dependent on the rivers for survival. The Lancang-Mekong and Nu-Salween Rivers flow through some of the poorest regions in China. In 2004, statistics showed that "all four counties of Nujiang Prefecture were listed as national-level impoverished counties . . . and some 57,000 households were reported to be living in shelters made of straw and sticks."<sup>74</sup> In 2005, the per-capita GDP in Yunnan Province was 7,833 RMB, compared with 14,068 RMB in China as a whole.<sup>75</sup> In 2007, Yunnan Province and Guangxi Zhuang Autonomous Region together had approximately 2.734 million people who lived below the poverty line, based on an annual income of less than 693 RMB.<sup>76</sup> In an effort to address the vast economic disparity between wealthy coastal cities and the western provinces, the Chinese government promulgated the Western Development Campaign in 1999.<sup>77</sup> The Campaign "legitimizes the construction of large-scale hydropower

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70. Kayo Onishi, *Water Governance of the Mekong River Basin and Chinese National Problems*, in *INTERNATIONAL WATER SECURITY: DOMESTIC THREATS AND OPPORTUNITIES* 195, 198 (Nevelin I. Pachova et. al., eds., 2008).

71. GOH, *supra* note 46, at 49.

72. Brown, *supra* note 3, at 618.

73. *China Looks to Increase Hydropower to Meet Clean Energy Goals*, CIRCLE OF BLUE (Jun. 2, 2010, 06:51 PM), <http://www.circleofblue.org/waternews/2010/world/china-looks-to-increase-hydropower-to-meet-clean-energy-goals/>.

74. Magee & McDonald, *supra* note 58, at 44.

75. Brown, *supra* note 3, at 623.

76. COUNTRY REPORT ON CHINA'S PARTICIPATION IN GREATER MEKONG SUBREGION COOPERATION, *supra* note 40.

77. Magee, *supra* note 37, at 24–26.

projects in less-developed but resource-rich western China in order to fuel further development in populous and industrialized eastern China.”<sup>78</sup> Proponents of the campaign maintain that hydropower development on the Lancang-Mekong and Nu-Salween Rivers in Yunnan Province will not only facilitate power transfer to energy-hungry cities such as Guangdong, Shanghai, and Beijing, but will also help lift communities in China’s southwestern provinces out of poverty by providing electricity and creating jobs.<sup>79</sup>

While hydropower development may create jobs in the short-term, some critics question whether hydropower development will actually benefit the local citizens of Yunnan in the long-term. First, the hope that hydropower development in the region will bring electricity to poorer regions of Yunnan Province has been undermined by the fact that high voltages produced by hydropower stations are often incompatible with the local grids.<sup>80</sup> Moreover, hydropower development in China between 1949 and 1999 displaced an estimated twelve million people.<sup>81</sup> The Three Gorges Dam, alone, displaced an estimated two million residents from thirteen cities, 140 towns, and 4,500 villages.<sup>82</sup> The government will resettle an estimated 50,000 people to make room for hydropower development on the Nu-Salween River.<sup>83</sup> Though estimates of the total population that will ultimately be displaced by development on the Lancang-Mekong River vary,<sup>84</sup> the number is certain to be great. Even when government compensation for resettlement has been forthcoming, and it frequently has not been,<sup>85</sup> resettlement is problematic for a variety of other reasons,

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78. Magee & McDonald, *supra* note 58, at 40.

79. Magee, *supra* note 37, at 24–26.

80. *Id.* at 32.

81. Brown, *supra* note 3, at 621.

82. NAVARRO, *supra* note 30, at 135.

83. GERALD A. MCBEATH & TSE-KANG LENG, GOVERNANCE OF BIODIVERSITY CONSERVATION IN CHINA AND TAIWAN 1 (2006).

84. For example, one early estimate stated that 23,000 to 35,000 people would be displaced by the construction of the Xiaowan Dam. Goh, *supra* note 46, at 43. Another estimate anticipated that the number of people who would be displaced by the construction of the Nuozhadu dam would be 23,000. Adam S. Rix, *The Mekong River Basin: A Resource at the Crossroads of Sustainable Development*, 21 TEMP. ENVTL. L. & TECH. J. 103, 127 (2003).

85. Citizens resettled during construction of the Manwan dam on the Lancang-Mekong River claim they were never compensated as promised. Magee, *supra* note 37, at 32. Citizens resettled during hydropower construction on the Yangtze and Nu Rivers also claim to have been denied compensation. UP THE YANGTZE (Zeitgeist Films 2008); CHENMO DE NU JIANG (沉默的怒江) [SILENT NU RIVER] (Xianggang Zhongwen Daxue Zhongguo Yanjiu Fuwu Zhongxin (香港中文大学中国研究服务中心) 2006); NU JIANG ZHI SHENG (怒江之声) [VOICE OF ANGRY RIVER] (Xianggang Zhongwen Daxue Zhongguo Yanjiu Fuwu Zhongxin (香港中文大学中国研究服务中心) 2006).

including community disarticulation, loss of livelihood, and resentment in host communities.<sup>86</sup> Because rural populations bear significant costs due to hydropower development through displacement, they should be involved in the decision-making process. However, interviews with local citizens suggest that developers of hydropower projects rarely, if ever, consult local populations and often fail to adequately compensate them.<sup>87</sup>

China's hydropower development program has also been criticized for its potentially negative impacts on the quantity and quality of water that reaches downstream riparian states. Some experts predict dams on China's section of the Lancang-Mekong River will disrupt natural flood patterns necessary for the cultivation of rice.<sup>88</sup> Others predict dams will trap sediments rich in minerals and nutrients, and disturb the productivity of downstream floodplains and fisheries that rely on seasonal flows.<sup>89</sup> These are reasonable concerns, given that approximately half of the mineral-rich sediment in the Lancang-Mekong River comes from flow originating in China,<sup>90</sup> and the Lower Mekong Basin supports a population of approximately sixty million people who rely heavily on the river to support fishing and agriculture.<sup>91</sup> If the upstream hydropower stations do disrupt seasonal flows, they could create real economic and food security problems for downstream riparian states.

Some research suggests that the concern over hydropower-induced flow changes, at least on the Lancang-Mekong, is exaggerated.<sup>92</sup> He Daming and Darrin Magee stated in their 2006 paper: "Assertions that the construction of the Lancang dams will have direct impacts on the entire Lancang-Mekong river system, its watershed, and even the entirety of Southeast Asia are overblown, unscientific, and irresponsible."<sup>93</sup> The study analyzed monthly runoff data from 1956 to 2001 at a series of monitoring stations on the mainstream Lancang-Mekong. One monitoring station was directly upstream of the Manwan hydropower station and two were downstream

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86. Brown, *supra* note 3, at 622.

87. In a 2006 study that interviewed citizens in the Nu River region, only sixteen percent of interviewees had been informed by an official government source that their village may be relocated. *Id.* at 624.

88. GOH, *supra* note 46, at 48–49.

89. MEKONG RIVER COMMISSION, MEKONG RIVER COMMISSION STATE OF THE BASIN REPORT 2010 SUMMARY, 21 (2010).

90. *Id.*

91. *Id.* at 3–5, 7–8.

92. He Daming, et al., *Transboundary Hydrological Effects of Hydropower Dam Construction on the Lancang River*, 51 CHINESE SCI. BULL. 16, 16–17 (2006).

93. *Id.* at 24.

from both the Manwan and Dachaoshan hydropower stations.<sup>94</sup> The study used data collected during various phases (pre-construction, construction, and post-construction) to analyze the potential hydrologic impact of China's hydropower development on downstream nations.<sup>95</sup> The authors concluded that, although downstream flow decreased while the Manwan and Dachaoshan hydropower stations were being constructed, flow returned to its normal (pre-construction) levels once the reservoirs were filled and the dams became operational.<sup>96</sup>

This conclusion is undermined, however, by the fact that there are few monitoring stations on the Lancang-Mekong River, and China limits the data publicly available from these stations.<sup>97</sup> Also, as noted in the study, changes in flow might be more pronounced in cities near the Laos-China border, where the total percentage of flow originating from China's section of the river is much higher than at other downstream locations.<sup>98</sup> Furthermore, given the scale of China's hydropower development plans and the many years it can take to fill a reservoir, impact on flow could extend over a long period. Recent fluctuations in the water flow in the lower Mekong have already been attributed to China's upstream activity, although others have attributed it to changing weather patterns and drought.<sup>99</sup> Finally, it should be noted that although this study concluded that hydropower construction would not affect water quality, there was no discussion of the methodology used to reach this conclusion.<sup>100</sup> There was no indication that the authors considered sediment-load in addressing water quality impacts.<sup>101</sup>

Finally, development on both the Lancang-Mekong and the Nu-Salween will adversely affect the diversity of plant and animal life supported by these river systems. According to a survey conducted by the Mekong Secretariat in 1976, the Greater Mekong Sub-region supports at least 212 species of mammals, 696 species of birds, 800 species of fish, and

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94. *Id.* at 17.

95. *Id.* at 19.

96. *Id.* at 19–20.

97. Telephone Interview with Katy Yan, *supra* note 59.

98. Overall, the percentage of flow that originates in China's section of the Lancang-Mekong River is only sixteen percent of the total lower Mekong's flow. *About the MRC: Upstream Partners*, MEKONG RIVER COMMISSION, <http://www.mrcmekong.org/about-the-mrc/upstream-partners-2/> (last visited May 3, 2012). However, at Laotian cities Chiang Saen, Luang Prabang, and Vientiane, China's section of the Lancang-Mekong River accounts for 66.6%, 47.2% and 39.3% of flow, respectively. He, *supra* note 92, at 19.

99. He, *supra* note 92, at 23.

100. *See id.*

101. *Id.*

213 species of reptiles and amphibians.<sup>102</sup> More recent studies suggest three quarters of the world's mammals and 1,200 species of fish are found in the basin, making it second only to the Amazon River in terms of aquatic-organism abundance and diversity.<sup>103</sup> The Nu-Salween River basin is also a biodiversity hotspot, supporting more than 12,000 plant species.<sup>104</sup> Given the rich biodiversity supported by both watershed regions, the environmental impacts of any proposed hydropower projects should be carefully assessed.

In sum, the issues surrounding the debate over China's hydropower construction on the Lancang-Mekong and Nu-Salween Rivers are complex. China's decision-makers may ultimately determine the costs of hydropower are worth bearing. Nevertheless, it is noteworthy that many of the greatest costs are being borne most directly by low-income, ethnic minority populations in Yunnan and by the citizens of downstream riparian states. The complexity of the issues at stake illustrate the need for China to possess a legal mechanism capable of critically assessing the impacts of hydropower development projects before moving forward with construction.

### III. THE LEGAL FRAMEWORK GOVERNING ENVIRONMENTAL IMPACT ASSESSMENT FOR HYDROPOWER DEVELOPMENT IN CHINA

#### A. *China's Environmental Impact Assessment Law*

The primary domestic legal mechanism for critically assessing the impacts of development projects is the environmental impact assessment (EIA). The purpose of an EIA is to "improve the quality of human life in a lasting way by examining and documenting the potential environmental impacts of a proposed activity and also [to] consider[] alternatives that may prevent or mitigate any perceived negative effects, thereby enabling fully informed, environmentally conscious decision-making."<sup>105</sup> In China, the

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102. Chen Lihui (陈丽晖) et al., *Guoji Heliu Liuyu Kaifazhong de Liyi Chongtu Jiqi Guanxi Xietiao* (国际河流域开发中的利益冲突及其关系协调) [*Coordinating the Relationships Between Interest Parties in Development of the International River*], 12(1) *Shijie Dili Yanjiu* (世界地理研究) [World Regional Studies] 71, 72 (2003).

103. *Id.*

104. Magee, *supra* note 41, at 117.

105. Jesse L. Moorman and Zhang Ge, *Promoting and Strengthening Public Participation in China's Environmental Impact Assessment Process: Comparing China's EIA Law and U.S. NEPA*, 8 *VT. J. ENVTL. L.* 281, 284–85 (2007).

EIA process is provided for by the Environmental Impact Assessment Law (EIA Law) adopted by State Council in 2002,<sup>106</sup> along with a variety of implementing regulations and measures, including: the Regulations on Open Government Information, promulgated by the State Council in 2008;<sup>107</sup> the Regulations on the Environmental Impact Assessment of Planning (PIA Regulations), promulgated by the State Council in 2009;<sup>108</sup> the Notice on Strengthening Environmental Protection Work in Hydropower Development, issued by the State Environmental Protection Administration (SEPA), the precursor to the MEP, and the National Development and Reform Commission (NDRC) in 2005;<sup>109</sup> the Provisional Measures on Public Participation in Environmental Impact Assessment, promulgated by SEPA in 2006;<sup>110</sup> and the Regulations on Environmental Management of Construction Projects, promulgated by the State Council in 1998.<sup>111</sup> Under the EIA Law and regulations, project proponents are required to conduct EIAs prior to commencing a variety of infrastructure projects, including those related to industry, energy, and natural resources development.<sup>112</sup>

Unfortunately, China's EIA laws and related regulations, as applied in the hydropower context, are inadequate to ensure a meaningful environmental impact assessment. According to Zhao Yuhong, Associate Professor of Law at the Chinese University of Hong Kong, "EIA as a management tool has largely been treated as a matter of formality and has

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106. Huanjing Yingxiang Pingjia Fa (环境影响评价法) [Environmental Impact Assessment Law] (promulgated by the Standing Comm. Nat'l People's Cong., Oct. 28, 2002, effective Sept. 1, 2003) [hereinafter EIA Law].

107. Zhengfu Xinxi Gongkai Tiaoli (政府信息公开条例) [Regulations on Open Government Information] (promulgated by the State Council, April 5, 2007, effective May 1, 2008) (China).

108. Guihua Huanjing Yingxiang Pingjia Tiaoli (规划环境影响评价条例) [Regulations on the Environmental Impact Assessment of Planning] (promulgated by the State Council, Aug. 12, 2009, effective Oct. 1, 2009) (China) [hereinafter PIA Regulations].

109. Guanyu Jiaqiang Shuidian Jianshe Huangjing Baohu Gongzuo de Tongzhi (关于加强水电建设环境保护工作的通知) [Notice on Strengthening Environmental Protection During Hydropower Construction] (promulgated by the State Env'tl. Prot. Admin. & Nat'l Dev. and Reform Comm'n, Jan. 20, 2005) [hereinafter SEPA/NDRC Notice].

110. Huanjing Yingxiang Pingjia Gongzhong Canyu Zanxing Banfa (环境影响评价公众参与暂行办法) [Provisional Measures on Public Participation in Environmental Impact Assessment] (promulgated by the State Env'tl. Prot. Admin., Feb. 14, 2006, effective Mar. 18, 2006) (China) [hereinafter Provisional Measures on Public Participation].

111. Regulations on Environmental Management of Construction Projects (promulgated by the State Council, Nov. 29, 1998, effective Nov. 29, 1998), [http://english.mep.gov.cn/Policies\\_Regulations/policies/EIA1/200711/t20071120\\_113154.htm](http://english.mep.gov.cn/Policies_Regulations/policies/EIA1/200711/t20071120_113154.htm).

112. EIA Law, *supra* note 106, at art. 8.

failed to prevent and mitigate environmental degradation caused by development projects.”<sup>113</sup> The failure of China’s EIA Law to prevent and mitigate environmental harm caused by hydropower projects can be attributed to three primary factors. First, although the EIA Law contains provisions that require development projects to engage affected communities in the decision-making process, proponents of hydropower projects have exploited an exception to these requirements to avoid public participation. Second, proponents of hydropower projects can legally commence dam construction activities without an approved comprehensive EIA because the Notice on Strengthening Environmental Protection Work in Hydropower Development issued by SEPA and the NDRC in 2005 allows the hydropower EIA process to be split into two separate parts, the Santongyiping EIA for site preparation work and the Project EIA for actual dam construction work.<sup>114</sup> Finally, the EIA Law encourages non-compliance by imposing minimal penalties on violators. Each of these causes for the failure of the EIA process as applied to hydropower development is discussed in further detail below.

First, critics point to a lack of meaningful public participation in the EIA Process.<sup>115</sup> Although China’s EIA Law encourages public participation, the extent of public involvement required in hydropower development projects is poorly defined.<sup>116</sup> Article 21 of the EIA Law states, “for the construction projects which may impose significant environmental impacts and for which it is necessary to work out a report of environmental impacts, the construction entity shall, before submitting the construction project for examination and approval, seek the opinions of relevant entities, experts and the general public by holding demonstration meetings, hearings or by any other means.”<sup>117</sup> However, the law contains a major loophole for hydropower corporations to avoid the process of public participation altogether. Specifically, Article 21 of the EIA Law exempts from the public participation requirement all construction projects classified by the state as “confidential.”<sup>118</sup> In the case of energy development, including hydropower development, plans are often classified as confidential; other than a single EIA summary, not one EIA for a hydropower plan on the Nu River has been

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113. Zhao Yuhong, *Assessing the Environmental Impact of Projects: A Critique of the EIA Legal Regime in China*, 49 NAT. RESOURCES J. 485, 486 (2009).

114. SEPA/NDRC Notice, *supra* note 109.

115. Zhao, *supra* note 113, at 498, 500.

116. Moorman, *supra* note 105, at 281–82.

117. EIA Law, *supra* note 106, at art. 21.

118. *Id.*

publicly released because plans on this transboundary river are considered “state secrets.”<sup>119</sup>

A related reason for limited public participation is a lack of public notice. The Regulations on Open Government Information indicate the government has an obligation to voluntarily provide information regarding development projects to the public.<sup>120</sup> According to the Regulations, the People’s Governments at or above the county level shall determine the specific government information to be voluntarily disclosed and shall prioritize disclosure of this information.<sup>121</sup> However, according to representatives at International Rivers, a non-profit advocacy organization based in Berkeley, California, remote areas in China often do not comply with the EIA public notice requirements.<sup>122</sup> In particular, International Rivers cites difficulty in obtaining public information on two hydropower projects on the Nu-Salween River: Songta in Tibet and Maji in Yunnan.<sup>123</sup>

The second reason China’s environmental impact assessment legal regime is inadequate in the context of hydropower development is because the Notice on Strengthening Environmental Protection Work in Hydropower Construction issued by SEPA and the NDRC in 2005 allows the hydropower EIA process to be split into two separate phases, the Santongyiping EIA and the Project EIA.<sup>124</sup> The Notice states that in order to shorten the period of time needed to construct hydropower projects, and to accelerate the benefits of hydropower, a local EPB can approve a Santongyiping EIA to allow preparatory work to commence in advance of full Project EIA approval.<sup>125</sup> The Santongyiping EIA only assesses the impacts of site preparation work that must take place before dam construction can begin, including preparatory work such as road construction, tunneling, and setting up of workers’ camps.<sup>126</sup> Although these preparatory activities have the potential to cause significant environmental harm, including stopping up the river with eroded soil, they can legally take place prior to the completion of the full Project EIA.<sup>127</sup> Such preparatory

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119. Telephone Interview with Katy Yan, *supra* note 59.

120. Regulations on Open Government Information, *supra* note 107, at art. 9–10.

121. *Id.* at art. 10.

122. Telephone Interview with Katy Yan, *supra* note 59.

123. *Id.*

124. SEPA/NDRC Notice, *supra* note 109.

125. *Id.*

126. Telephone Interview with Katy Yan, *supra* note 59.

127. *Id.*

work has already begun at several dam sites on the Nu-Salween River, despite the fact that a full Project EIA has yet to be completed.<sup>128</sup>

The Santongyiping EIA is also problematic because it can be approved by a local EPB. Under the EIA Law, the more serious the environmental impacts of a project, the higher level of government approval required.<sup>129</sup> This requirement reduces the risk of local bias in the EIA approval process for projects likely to have significant impacts. At least in theory, then, large-scale hydropower project plans, because their impacts are significant, should require approval by the MEP, the highest government body responsible for EIA approval.<sup>130</sup> However, because the Santongyiping EIA only concerns preparatory site work in advance of actual construction of the hydropower station, the Santongyiping EIA is not broad enough in scope to require this higher level of approval.<sup>131</sup> Instead, the Santongyiping EIA only requires the approval of the local government's EPB.<sup>132</sup> Because it is often in the local government's economic interest to promote hydropower development, the Santongyiping EIA process is more likely to be influenced by local government bias.<sup>133</sup> Therefore, by separating the Santongyiping EIA from the full Project EIA, the Notice issued by SEPA and the NDRC in 2005 has allowed biased government support for projects to undermine the validity of the EIA process in the context of hydropower development.

The third reason China's EIA Law is ineffective is that the consequences for non-compliance are so minimal, and the cost of compliance so high, many companies simply choose not to comply.<sup>134</sup> Article 31 of the EIA Law provides that if a project proponent fails to obtain an approved EIA prior to the commencement of construction, the appropriate EPB shall suspend construction and require the construction entity to complete the EIA process within a prescribed time period.<sup>135</sup> If the construction entity still fails to complete the EIA process within a prescribed time period, the appropriate EPB shall impose a fine between 50,000 and 200,000 RMB.<sup>136</sup> This means violators get a second chance to avoid a fine and, even if they still fail to comply, the fine is minimal.

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128. *Id.*

129. Zhao, *supra* note 113, at 494, 496–97.

130. *Id.* at 495–97.

131. Interview with Chang Cheng, *supra* note 7.

132. SEPA/NDRC Notice, *supra* note 109.

133. Interview with Chang Cheng, *supra* note 7.

134. Zhao, *supra* note 113, at 500–01.

135. EIA Law, *supra* note 106, at art. 31.

136. *Id.*

Compliance, on the other hand, can be both expensive and time consuming. According to Zhao Yuhong, “it is much more cost-effective to break the law than to comply with it.”<sup>137</sup> China’s EIA Law does not make it necessary or even advantageous to complete an EIA prior to commencing construction.

For the reasons discussed above, the EIA Law and its related regulations and measures have not been effective in creating a meaningful assessment of the true environmental and social impacts of hydropower projects in China.

### B. Case Study: Xiaonanhai

One case involving a hydropower development project on the upper reaches of the Yangtze (Jinsha) River illustrates the ineffectiveness of China’s current EIA legal regime to meaningfully evaluate the impacts of hydropower development. The hydropower construction project located at Xiaonanhai, near Chongqing<sup>138</sup> illustrates how local government bias and lack of public participation can weaken the hydropower EIA process.

The largest project in Chongqing during its 11th Five-Year Plan, Xiaonanhai hydropower station, was to be located in the Shangyou Rare Endemic Fish National Nature Reserve in the upper reaches of the Yangtze River.<sup>139</sup> This nature reserve was created, in part, in response to environmental concerns that arose downstream from the construction of the Three Gorges Dam.<sup>140</sup> The predicted ecological impacts of the Xiaonanhai dam on the nature reserve were significant.<sup>141</sup> Study results showed that the dam would have a destructive effect on the spawning grounds and habitats of many rare and endemic fish species by altering the current speed, water temperature, and water quality of the river.<sup>142</sup> To accommodate the Xiaonanhai hydropower development plans, in 2010 an MEP expert group

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137. Zhao, *supra* note 113, at 501.

138. Interview with Chang Cheng, *supra* note 7.

139. Qin Weihua (秦卫华), et al., *Xiaonanhai Shuili Gongcheng dui Changjiang Shangyou Zhenxi Teyou Yulei Ziran Baohuqu Shengtai Yingxiang Yuce*, (小南海水利工程对长江上游珍稀特有鱼类自然保护区生态影响预测) [Prediction of Ecological Impacts of the Planned Xiaonanhai Power Dam on the Rare and Endemic Fishes Nature Reserve in the Upper Reaches of the Yangtze River], 24(4) SHENGTAI YU NONGCUN HUANJING XUEBAO (生态与农村环境学报) [J. OF ECOLOGY AND RURAL ENV'T] 23, 23 (2008).

140. Interview with Chang Cheng, *supra* note 7.

141. Qin, *supra* note 139, at 23.

142. *Id.*

gave its pre-approval, and in 2011 the State Council gave its final approval to narrow the scope of the protected area.<sup>143</sup>

This case illustrates how the separation of the hydropower EIA into the Santongyiping EIA and the Project EIA weakens the effectiveness of the EIA Law. In the Xiaonanhai case, the Santongyiping EIA needed approval only by the Chongqing municipal EPB, rather than by a more central government EPB.<sup>144</sup> According to Friends of Nature, an environmental NGO based in Beijing that has been involved in the Xiaonanhai case, local economic incentives made it more likely than not that Chongqing would approve the Santongyiping EIA without critically analyzing the environmental costs of the project.<sup>145</sup> Indeed, public participation in the process of gaining preliminary approval to change the boundary of the Shangyou Rare Endemic Fish National Nature Reserve was limited.<sup>146</sup> In 2010, prior to the MEP's pre-approval of the boundary change, there were no public notice and no public hearing regarding plans to change the boundary of the nature reserve.<sup>147</sup> By law, project proponents and the government must make relevant information available to the public at three different stages of the EIA process.<sup>148</sup> The first public notice must occur within seven days of when a project proponent appoints a consultant to complete an EIA.<sup>149</sup> The second notice must take place after a draft EIA has been completed; a summary must be released to the public for comment.<sup>150</sup> Finally, after the EIA Report has been sent to the EPB for review, the public should again receive notice.<sup>151</sup> In the case of Xiaonanhai, the first phase of notice lasted only twelve days, and the second phase began before the first phase was completed, which indicates public opinion was not considered in the decision-making process.<sup>152</sup> Chang Cheng, of Friends of Nature's Public Participation and Information Disclosure Program, stated that the required notice periods were completed at "highway speed" and that only a shortened version of the Santongyiping EIA Report, which contained limited information on the possible ecological impacts of the project, was

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143. Interview with Chang Cheng, *supra* note 7.

144. *Id.*

145. *Id.*

146. *Id.*

147. *Id.*

148. *Id.*

149. Provisional Measures on Public Participation, *supra* note 110, at art. 8.

150. *Id.* at art. 9.

151. *Id.* at art. 13.

152. Interview with Chang Cheng, *supra* note 7.

released to the public.<sup>153</sup> Friends of Nature has brought an administrative review case to challenge the decision to change the boundary of the nature reserve. Moving forward, the organization is also pursuing ways to ensure the Project EIA complies with relevant public participation requirements.<sup>154</sup>

Xiaonanhai illuminates some of the major weaknesses of China's EIA Law, at least insofar as the law is applied to hydropower development. The ability to split the EIA process into two phases allows local governments to approve projects they want to approve without forcing them to look critically at the environmental impacts of the projects. It is difficult for this local decision-making process to be unbiased and objective. Similarly, Xiaonanhai shows how easy it is for local governments to ignore the requirements of the EIA Law and pursue hydropower development plans without engaging the public through legally required public notice and comment periods. If the EIA Law and implementing regulations are only enforceable at the discretion of local governments, they do not have the force to ensure environmentally and socially sustainable development.

### *C. China's Regulations on the Environmental Impact Assessment of Planning*

China is aware of the shortcomings and weaknesses of its EIA Law and related regulations in the context of hydropower development and continues to adopt measures to strengthen and enhance implementation. One way the central government has attempted to combat inconsistent local implementation of the EIA Law and related regulations is to supplement the project-level, company-driven EIA process with a comprehensive, regional planning EIA process. In October 2009, the State Council promulgated Regulations on the Environmental Impact Assessment of Planning (PIA Regulations), which require planning institutions to conduct regional EIAs at the planning stage of development.<sup>155</sup> The regulations provide that the relevant departments of the State Council, along with the local people's governments, shall complete an EIA for all projects related to "energy, water resources . . . and development of natural resources."<sup>156</sup> The PIA Regulations refer to this as "special planning."<sup>157</sup> Under the regulations, the actual planning EIA document must include an analysis and assessment of

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153. *Id.*

154. *Id.*

155. PIA Regulations, *supra* note 108, at art. 1–2.

156. *Id.* at art. 2.

157. *Id.*

the potential impact of a project on the ecological system of the relevant basin region and an analysis of the potential long-term impacts of the project on environmental and human health.<sup>158</sup> The PIA Regulations were designed to impose EIA-like requirements on the Ministries and other planning institutions responsible for putting together regional plans; they require an assessment of the impacts of hydropower development earlier in the planning process and on a regional (basin-wide), rather than local (project-specific) scale.<sup>159</sup>

Despite some optimism, it seems unlikely the PIA Regulations will have the desired impact on the integrity of the EIA process because they do not include a mechanism for meaningful review by affected parties.<sup>160</sup> The PIA reports are completed internally by planning institutions, and the regulations do not include a provision regarding public notice or public participation.<sup>161</sup> While the PIA Regulations do require an expert review team to provide commentary on the environmental impacts of a regional development plan,<sup>162</sup> the expert commentary is only advisory and may be rejected if it interferes with the plan.<sup>163</sup> Although it is possible the PIA Regulations could improve the EIA Law by adding a supplemental impact assessment process at the planning stage, there has been no evidence to date that the PIA Regulations have improved the hydropower planning process. For example, the planning process for the Yangtze River has nearly been completed using the new PIA Regulations, yet the revised plan still lists almost all of the hydropower projects present in the original plan completed in the 1990s.<sup>164</sup>

Of potentially greater value are two new policies related to hydropower development released in 2012 by the MEP and in 2011 by the NDRC. On January 6, 2012, the Environmental Impact Evaluation Division of the MEP issued a Notice on Further Strengthening Environmental Protection During Hydropower Construction to the environmental protection administrations in all provinces and administrative regions.<sup>165</sup> To promote environmental

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158. *Id.* at art. 8.

159. Interview with Chang Cheng, *supra* note 7.

160. *Id.*

161. *Id.*

162. PIA Regulations, *supra* note 108, at art. 17.

163. *Id.* at art. 22; Interview with Chang Cheng, *supra* note 7.

164. Interview with Chang Cheng, *supra* note 7.

165. Guanyu Jinyibu Jiaqiang Shuidian Jianshe Huanjing Baohu Gongzuo de Tongzhi (关于进一步加强水电建设环境保护工作的通知) [Notice on Further Strengthening Environmental Protection During Hydropower Construction] (promulgated by the Env'tl. Impact Evaluation Div. of the Ministry of Env'tl. Prot., Jan. 6, 2012) (China).

protection, this notice recognizes the importance of making the EIA Law and related regulations, including public notice and public participation provisions, applicable to the hydropower EIA.<sup>166</sup> The policy also stresses the importance of strengthening the Santongyiping EIA by including it in the Project EIA.<sup>167</sup> Additionally, in 2011, the NDRC Environmental Protection Department released Provisional Measures for the Evaluation of River Hydropower Plans and Environmental Impact Statements.<sup>168</sup> These measures articulate similar objectives for environmental protection during the process of hydropower development on transboundary rivers.<sup>169</sup> Nevertheless, there are no specific guidelines on how to carry out the objectives expressed in these policies and their potential effectiveness thus remains uncertain.

#### IV. TRANSBOUNDARY ENVIRONMENTAL IMPACT ASSESSMENT: AN INTERNATIONAL LEGAL REGIME FOR TRANSBOUNDARY WATER RESOURCE MANAGEMENT

The failures of China's domestic EIA in the hydropower context are partly the result of a legislative design that provides multiple avenues for hydropower project proponents to evade EIA requirements. Yet even if China were to amend its domestic EIA process and eliminate the exceptions for hydropower, the EIA process would still fail to address legitimate concerns of downstream riparian states because it is not designed to assess transboundary impacts. Ideally, an impact assessment mechanism for development on transboundary rivers should consider not only domestic but also transboundary effects of hydropower development. China's situation on the Lancang-Mekong and Nu-Salween Rivers is not unique. Today, there are at least 250 water systems worldwide shared between two or more states.<sup>170</sup> An emerging body of international law has developed to help states manage these transboundary water resources.<sup>171</sup> In particular, recently

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166. *Id.* at art. 1.

167. *Id.* at art. 3.

168. Heliu Shuidian Guihua Baogao ji Guihua Huanjing Yingxiang Baogaoshu Shencha Zaxing Banfa (河流水电规划报告及规划环境影响报告书审查暂行办法) [Provisional Measures for the Evaluation of River Hydropower Plans (RHPs) and Environmental Impact Statements (EISs)], (promulgated by the Nat'l Dev. and Reform Comm'n, 2011, effective 2011) at ch. 1 (China).

169. *Id.* at chap. 2, art. 8.

170. Richard Paisley, *Adversaries Into Partners: International Water Law and the Equitable Sharing of Downstream Benefits*, 3 MELB. J. OF INT'L L. 281, 281 (2002).

171. See UNITED NATIONS CONVENTION ON THE LAW OF THE NON-NAVIGATIONAL USES OF INTERNATIONAL WATERCOURSES, G.A. Res. 51/229, 51st Sess., Agenda Item 144, U.N. Doc. A/RES/51/229 (May 21, 1997); THE HELSINKI RULES ON THE USES OF THE WATERS OF INTERNATIONAL

negotiated bilateral and multilateral treaties between riparian states provide for the preparation of Transboundary Environmental Impact Assessments (TEIAs).<sup>172</sup> “Transboundary EIA treaties ensure states give extraterritorial impacts the same scrutiny as domestic impacts.”<sup>173</sup> The primary legal instrument for the TEIA is the Convention on Environmental Impact Assessment in a Transboundary Context, known as the Espoo Convention.<sup>174</sup> Although China is not a party to, and therefore not bound by, the Espoo Convention, forty-five states are parties to the treaty, including states from Europe, Asia, and North America.<sup>175</sup> In fact, “a number of scholars argue that transboundary EIA has reached the status of customary international law.”<sup>176</sup>

In addition to the Espoo Convention, there are several other treaties that incorporate the idea of the TEIA, including the North American Agreement on Transboundary Environmental Impact Assessment and the Framework Convention for the Protection of the Marine Environment of the Caspian Sea.<sup>177</sup> Zambia and Zimbabwe successfully conducted a TEIA to assess how to deal with increased tourism on the Zambezi River after Victoria Falls was declared a UNESCO World Heritage Site in 1989.<sup>178</sup> And in fact, the transboundary EIA is not a foreign concept to China; in September 2001, China, Burma, Laos, and Thailand conducted a TEIA to assess the impacts of blasting rapids as part of the Mekong River Navigation Improvement Project.<sup>179</sup>

Though many questions remain unanswered regarding how to develop a successful TEIA legal regime, the existence of these international agreements reflects the growing recognition that transboundary natural resources are best managed using an international law approach. It also

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RIVERS, International Law Association, (1967); THE BERLIN RULES ON WATER RESOURCES, International Law Association, (2004).

172. Charles M. Kersten, *Rethinking Transboundary Environmental Impact Assessment*, 34 YALE J. INT'L L. 173, 178–79 (2009).

173. *Id.* at 174.

174. Convention on Environmental Impact Assessment in a Transboundary Context, Feb. 25, 1991, 189 U.N.T.S. 309 (entered into force Sept. 10, 1997), available at <http://www.unep.org/fileadmin/DAM/env/eia/documents/legaltexts/conventioncontextenglish.pdf>.

175. *Convention on Environmental Impact Assessment in a Transboundary Context: Status as at: 08-05-2012 10:28:43 EDT*, UNITED NATIONS TREATY COLLECTION (May 9, 2012 03:30 PM), [http://treaties.un.org/Pages/ViewDetails.aspx?src=TREATY&mtdsg\\_no=XXVII-4&chapter=27&lang=en](http://treaties.un.org/Pages/ViewDetails.aspx?src=TREATY&mtdsg_no=XXVII-4&chapter=27&lang=en).

176. Kersten, *supra* note 172, at 180.

177. *Id.* at 178–79.

178. Angela Z. Cassar & Carl E. Bruch, *Transboundary Environmental Impact Assessment in International Watercourse Management*, 12 N.Y.U. ENVTL. L.J. 169, 232–33 (2003).

179. *Id.* at 236.

demonstrates the increasing willingness of states to engage in regional assessments of the impacts of development projects.

China could elect to engage in a regional assessment of the transboundary impacts of its hydropower development on the Lancang-Mekong and Nu-Salween Rivers. Fortunately, a regional management body for the Lancang-Mekong River already exists to support such an effort. Originally founded in the 1950s as the Mekong Committee,<sup>180</sup> the Mekong River Commission (MRC) was established in 1995 and is a regional advisory body composed of water and environment ministers from member countries Cambodia, Laos, Thailand, and Vietnam.<sup>181</sup> China is a dialogue partner along with Burma.<sup>182</sup> The MRC tackles such issues as agriculture, river transport, fisheries management, and hydropower development in the Lancang-Mekong River basin.<sup>183</sup> The MRC's Initiative on Sustainable Hydropower focuses on improving regional cooperation and information sharing. It has also developed and utilized tools to help member countries assess the transboundary impacts and sustainability of hydropower projects on a basin-wide level.<sup>184</sup>

China's participation in this framework has so far been quite limited. China signed an agreement with the MRC in 2002 to provide flood season water level and rainfall data from the upper Lancang-Mekong to the MRC.<sup>185</sup> However, it has decided to only minimally engage with the MRC and its member countries on the issue of hydropower development in the Lancang-Mekong. Instead of protecting its interest in unilaterally pursuing hydropower development plans, China could further strengthen its relationship with the MRC. China could use the MRC as a forum to engage in dialogue with downstream riparian states, and the MRC could ultimately play a role in the development of a TEIA system on the Lancang-Mekong River. By engaging with the MRC, China would not only enhance the effectiveness of the overall impact assessment mechanism but might also

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180. *About the MRC: History*, MEKONG RIVER COMMISSION, <http://www.mrcmekong.org/about-the-mrc/history> (last visited May 3, 2012).

181. *About the MRC*, MEKONG RIVER COMMISSION, <http://www.mrcmekong.org/about-the-mrc> (last visited May 3, 2012).

182. *About the MRC: Upstream Partners*, *supra* note 98.

183. *Topics*, MEKONG RIVER COMMISSION, <http://www.mrcmekong.org/topics> (last visited November 6, 2012).

184. *Initiative on Sustainable Hydropower*, MEKONG RIVER COMMISSION, <http://www.mrcmekong.org/about-the-mrc/programmes/initiative-on-sustainable-hydropower> (last visited November 6, 2012).

185. *Lao Vientiane, MRC, China and Myanmar Cooperate on Shared Mekong Resources*, MEKONG RIVER COMMISSION, <http://www.mrcmekong.org/news-and-events/news/mrc-china-and-myanmar-cooperate-on-shared-mekong-resources> (last visited November 6, 2012).

strengthen its diplomatic relations in the process. Without China, the MRC's capacity to meaningfully address transboundary impacts of hydropower development on the Lancang-Mekong River will be restricted, and its ability to achieve comprehensive basin development planning hindered.

## V. RECOMMENDATIONS

This paper recognizes that the domestic environmental impact assessment process alone, even if better implemented, may not be sufficient to address all of the concerns raised in the debate over China's hydropower development on the transboundary Lancang-Mekong and Nu-Salween Rivers. As noted above, transboundary impacts may be better addressed through increased collaboration with downstream nations and the development of some form of transboundary environmental impact assessment legal mechanism.

Until such methods are developed, China must rely on its domestic EIA Law and implementing regulations to require planning institutions and project proponents to complete a meaningful and objective assessment of the environmental impacts of hydropower plans. The case of Xiaonanhai and various examples from sites on the Nu-Salween River illustrate the ineffectiveness of China's current EIA laws and regulations for addressing potential environmental and social impacts of hydropower development. The hydropower EIA process is frustrated by a lack of public notice and public participation in the decision-making process, government bias in EIA approval, and limited compliance.

In order to improve public notice and public participation in the hydropower EIA process, the EIA Law provision that exempts "confidential" plans from public notice and public participation requirements should be deleted. Rather than classifying hydropower projects on transboundary rivers as state secrets, environmental impact assessment information should be released both to the local public who will be directly impacted by the projects and to downstream riparian states. If there are no harmful downstream impacts, releasing this information will allay the concerns of downstream states. If there are substantive reasons for concern, releasing this information will allow downstream states to work cooperatively with China to mitigate negative impacts.

The hydropower EIA process could be improved by incorporating the Santongyiping EIA into the Project EIA. Hydropower construction companies should not be able to speed through the Santongyiping EIA process and commence preparatory construction work prior to the

completion and approval of a comprehensive Project EIA. From an environmental protection standpoint, it makes little sense to allow companies to commence pre-construction activities such as forest clearing, road building, and tunneling before a full Project EIA has been approved. And from a practical standpoint, it makes little sense to reject a full Project EIA once such pre-construction activities have already been completed. Under the current approach, the Project EIA becomes a largely meaningless formality. The existence of the Santongyiping EIA thus cripples the EIA Law's capacity to stop or improve "bad" projects. Moreover, incorporating the Santongyiping EIA into the Project EIA will remove potentially biased local government EPBs from the EIA approval process and ensure that the impacts of pre-construction activities are evaluated critically.

Finally, the EIA Law should enhance penalties for non-compliance. Without this step, the law will continue to be ineffective at the most basic level. Compared with the high investment involved in hydropower projects, the minimal fines for non-compliance imposed by the EIA Law are negligible.

#### CONCLUSION

Given China's imminent need to develop domestic sources of renewable energy, it is understandable that China's EIA Law and implementing regulations provide exceptions to potentially cumbersome and time-consuming public participation and accountability requirements. Absent these exceptions, the EIA mechanism would likely slow the speed with which China can pursue hydropower development and impede China's attempts to reduce its reliance on coal. Despite the benefits of the current EIA policy, the potentially irreversible environmental, social, and even political consequences of China's hydropower development on the Lancang-Mekong and Nu-Salween Rivers demand a more deliberate impact assessment process. This goal can only be achieved by eliminating the provisions that exempt hydropower projects from full compliance with EIA requirements.