

THIS LAND IS YOUR LAND, THIS LAND IS MY LAND¹:
REMEDIES FOR CHINA'S POLLUTED LAND AND SOIL

INTRODUCTION

Agriculture is at the heart of China's domestic economy. Over 45 percent of the total labor force is engaged in agricultural production, accounting for 11.9 percent of China's GDP.² But studies also indicate that the economic losses China suffers through environmental deterioration constitute 13–15 percent of GDP.³ And soil, the foundation of Chinese's agriculture industry, has been greatly affected by pollution from state and private enterprises all over the country. As a consequence of the soil pollution, over 12 million tons of food supplies nationwide are contaminated by heavy metals in the soil every year.⁴ In comparison, in the United States, only 0.7 percent of the labor force is engaged in agriculture activities such as farming, forestry, and fishing.⁵ These agricultural activities make up the smallest sector of the U.S. economy, accounting for 0.9 percent of the U.S. GDP.⁶ The last time that over 45 percent of the U.S. labor force was engaged in agriculture was in 1880.⁷

The United States has also suffered from soil contamination. Studies in the late 1980s indicated that the United States had roughly 400,000-600,000 sites contaminated by hazardous wastes.⁸ In response to increasing hazardous waste contamination, the U.S. Congress developed

¹ WOODY GUTHRIE, *This Land Is Your Land*, on THE GREATEST SONGS OF WOODY GUTHRIE (Vanguard Records 1972). "This Land Is Your Land," considered America's unofficial national anthem celebrates the natural beauty and bounty of America's lands. Peter Dreier & Dick Flacks, *Patriotism's Secret History*, THE NATION, June 3, 2002, at 39.

² CENT. INTELLIGENCE AGENCY, THE WORLD FACTBOOK: CHINA (2006), available at <https://www.cia.gov/cia/publications/factbook/geos/ch.html> [hereinafter CHINA WORLD FACTBOOK].

³ Tan Zuoren, *Our Land is Under Siege*, CHINA RIGHTS FORUM, Apr. 12, 2006, at 34.

⁴ Chinese Government's Official Web Portal, *China Faces 'Serious' Soil Pollution: SEPA*, XINHUA, July 18, 2006 http://english.gov.cn/2006-07/18/content_339294.htm [hereinafter *China Faces 'Serious' Soil Pollution*].

⁵ CHINA WORLD FACTBOOK.

⁶ CHINA WORLD FACTBOOK.

⁷ About Growing a Nation, A History of American Agriculture: Farmers & the Land, http://www.agclassroom.org/gan/timeline/farmers_land.htm (last visited Mar. 30, 2007).

⁸ PETER B. MEYER ET AL., CONTAMINATED LAND: RECLAMATION, REDEVELOPMENT AND REUSE IN THE UNITED STATES AND THE EUROPEAN UNION 15 (1995).

extensive statutory and common law remedies such as the Comprehensive Environmental Response, Compensation and Liability Act (“CERCLA”) to determine liability, clean up contaminated sites, and provide monetary incentives for revitalizing contaminated lands. Because compensation and remedies for land contamination are often litigated, the U.S. courts have attempted to address legal causation, compensation amounts, identification and liability of potential responsible parties, and other remedies.

In contrast, the current Chinese legal system has limited remedies to clean up contaminated soil and to compensate landowners for their loss of productive farmland. Villagers and farmers have the option to seek administrative remedies from their local environmental protection administrative agency or seek judicial remedy. Currently these types of remedies have not been effective in addressing the soil contamination problem in rural China. Meanwhile, farmers are dying from soil and water pollution and crops are destroyed.

Elements of the U.S. regulatory program like CERCLA may be adapted to provide for personal injury compensation and remedies for contaminated soil in China. But economic, political, as well as cultural factors may limit how new regulatory programs are integrated into the Chinese legal framework. This Article aims to target the elements within both legal frameworks that could be used to develop effective laws that will help promote remediation of contaminated land and soil and provide compensation to victims of soil pollution.

I. SOIL POLLUTION CRISIS IN CHINA

A. Background

China is facing a soil pollution crisis that threatens the natural environment, public health, food safety, and the sustainable development of agriculture for the entire country.⁹ China’s soil pollution has been called “invisible pollution” because unlike water and air

⁹ *China Faces ‘Serious’ Soil Pollution*, *supra* note 4.

pollution, soil pollution has less visible and obvious warning signals.¹⁰ The soil pollution epidemic has three major issues: (1) quantity and scope of soil pollution; (2) adverse effects on public health, natural environment, and the economy; and (3) ineffective soil pollution control, regulation, and enforcement. These major roadblocks have prevented China's government from adequately addressing the pollution problems that continue to worsen every day.

The scope and quantity of soil pollution affects about one-tenth of China's arable land.¹¹ According to incomplete Chinese government statistics, 150 million mu¹² of China's 1.8 billion mu of arable lands have been polluted.¹³ Contaminated water is used to irrigate 32.50 million mu of farmland and another 2 million mu have been covered or destroyed by solid wastes.¹⁴ The major sources of soil pollution are heavy metals from industrial sources and pesticide use on crops.¹⁵ Pesticides have been widely used on crops for decades to increase crop yield and prevent plant diseases.¹⁶ The use of more than 1.2 million tons of pesticides have contaminated 7 percent of China's arable lands.¹⁷ The pesticide residual pollution is aggravated by the ineffective application of pesticides to crops.¹⁸

The extent of China's soil pollution causes many adverse public health, natural environment, and economic effects. China's State Environmental Protection Administration estimates that 12 million tons of food supplies nationwide are contaminated by heavy metals

¹⁰ Qi Xu, *Facing Up to "Invisible Pollution"*, CHINA ENVTL. TIMES, Dec. 28, 2006, *adapted by* China Dialogue, <http://www.chinadialogue.net/article/show/single/en/724-Facing-up-to-invisible-pollution->.

¹¹ *Id.*

¹² One acre is equal to 6.070 mu. 150 million mu is equivalent to 10 million hectares.

¹³ *China Faces 'Serious' Soil Pollution*, *supra* note 4.

¹⁴ Xu, *supra* note 10.

¹⁵ Zijun Li, *Soil Quality Deteriorating in China, Threatening Public Health and Ecosystems*, WORLDWATCH INST., <http://www.worldwatch.org/node/4419>.

¹⁶ *Id.*

¹⁷ *Id.*

¹⁸ *Id.*

every year, resulting in direct economic losses exceeding 20 billion *yuan* (about \$2.5 billion).¹⁹ These heavy metals, pesticide residuals, and other hazardous pollutants accumulate in farm crops and through the food chain, cause illness and adverse health effects.²⁰ For example, insecticides and germicides containing copper sulfate compounds have contaminated fruit, resulting in chronic symptoms similar to poisoning at higher intake levels.²¹ The average amount of nitrate in vegetables in China's southern regions is 70 percent above China's national safety standards.²² When absorbed by human bodies through food consumption, nitrate can deoxidize into nitrite, a known human carcinogen.²³ These are only a few known examples of the possible adverse health effects of the extensive soil pollution in China.

In addition, soil pollution directly affects soil fertility and surrounding ecosystems. Heavy metals such as mercury and zinc accumulate in the soil and hardened the soil surface, reducing soil fertility and crop yields.²⁴ Because pesticides and fertilizers are applied inefficiently, nearly half of the nitrogen fertilizer applied in China evaporates or runs off the land, contaminating groundwater with nitrates, as well as affecting crop biodiversity and creating a nutrient imbalance in surface waters.²⁵

In China, soil pollution control, regulation, and enforcement are weak and ineffective.²⁶ The current Chinese laws on soil pollution control are inadequate, and comprehensive national environmental standards for soil have not been completed.²⁷ Efforts to control soil pollution are

¹⁹ *China Faces 'Serious' Soil Pollution*, *supra* note 4. In 2006, 1U.S. dollar was equal to 7.97 *yuan*. CENT. INTELLIGENCE AGENCY, THE WORLD FACTBOOK 2007: FIELD LISTING – CURRENCY, <https://cia.gov/cia//publications/factbook/fields/2065.html>.

²⁰ Xu, *supra* note 10.

²¹ Li, *supra* note 15.

²² *Id.*

²³ *Id.*

²⁴ *Id.*

²⁵ *Id.*

²⁶ *Id.*; Xu, *supra* note 10.

²⁷ Li, *supra* note 15.

hindered by the lack of data on the distribution and the degree of soil pollution in the whole country.²⁸ China has very limited funding to complete much needed soil scientific research to begin addressing the soil contamination crisis and develop remedies.²⁹ Without understanding the scope, magnitude, and geographic areas that are most affected by soil pollution, the government is powerless to tackle the problem. As a first step, the State Environmental Protection Administration and the Ministry of Land Resources have launched the first comprehensive soil pollution survey to assess the extent of heavy metal, pesticide residues, and pollutants in the soil.³⁰ The three-year survey will cost 1 billion *yuan* (\$128.6 million) and is targeted to conclude in 2008.³¹ The survey will identify the type, degree, and cause of heavily polluted lands; evaluate risks as a result of the soil pollution; determine soil classification; set national environmental soil standards; improve land and soil management; and draft soil pollution laws.³² The results of the survey will be used to conduct pilot remediation and comprehensive treatment projects of polluted soil and establish a soil quality and management system for China.³³ Even without the survey results, the Chinese government and its citizens are now well aware that the soil pollution cannot be ignored and is one of the consequences of China's rapid economic growth.³⁴

B. Case study: Cancer Villages in Wengyuan County, China

China's quest to become a "global economic powerhouse"³⁵ has been an economic success with tragic consequences for China's natural resources, environment, and public

²⁸ Xu, *supra* note 10.

²⁹ *Id.*

³⁰ *China Faces 'Serious' Soil Pollution*, *supra* note 4.

³¹ Xu, *supra* note 10.

³² *Id.*

³³ *China Faces 'Serious' Soil Pollution*, *supra* note 4.

³⁴ Li, *supra* note 15.

³⁵ ELIZABETH C. ECONOMY, *THE RIVER RUNS BLACK* 60 (2004).

health.³⁶ The effects of this rapid economic growth on the environment and its citizens are best illustrated in the “Cancer Villages” located along the Hengshi River in Wengyuan County of southern China’s Guangdong Province.³⁷ In Shangba, one of the rural farming villages located along the Hengshi River, more than 250 of about 3,000 total villagers have died from cancer since 1987.³⁸ In 2003, fourteen of the thirty-one villagers died from cancer.³⁹ In 2005, only two of the eleven people died from natural causes or from an accident; the remaining died from cancer.⁴⁰ The suspected cause of these cancer-related deaths is the Hengshi River which has been heavily polluted by the state-owned Dabaoshan Mining Corporation.

1. The Toxic Waters of the Hengshi River in Guangdong Province

The Hengshi River is a third-order tributary of the Beijiang River⁴¹ and is fed by the mountain spring in Dabao Mountain in Shaoguan City, Wengyuan County.⁴² The Hengshi River is used for drinking and irrigation water for the farmers in the Shangba, Liangxiao, Tangxin, and Yanghe villages who live downstream of mining operations on Dabao Mountain.⁴³ Twenty years ago, the Hengshi River was a healthy and clear river that deposited fertile soil as it wound through villages like Shangba and Liangxiao, but today the Hengshi River is now called the “dead river” without a trace of any fish and shrimp.⁴⁴

³⁶ See *id.* 60-90 (describing how rapid and unrestrained economic development beginning in the 1970s came at the expense of the natural environment and public health throughout the country).

³⁷ Dan Griffiths, *China’s ‘Cancer Villages’ Pay Price*, BBC NEWS, Jan. 17, 2007, <http://news.bbc.co.uk/2/hi/asia-pacific/6271103.stm>; Yang Chuanmin & Fang Qianhua, *A Village of Death and its Hopes for the Future*, CHINA RIGHTS FORUM, Apr. 12, 2006, at 25.

³⁸ Yang & Fang, *supra* note 37, at 25.

³⁹ *A Great Wall of Waste – China’s Environment*, THE ECONOMIST, Aug. 21, 2004, at Special Report 2.

⁴⁰ Yang & Fang, *supra* note 37, at 26.

⁴¹ C. Lin et al., *Environmental Impacts of Surface Mining on Mined Lands, Affected Streams and Agricultural Lands in the Dabaoshan Mine Region, Southern China*, 16 LAND DEGRADATION & DEV. 463, 463 (2005).

⁴² Yang & Fang, *supra* note 37, at 25.

⁴³ Griffiths, *supra* note 37. Yang & Fang, *supra* note 37, at 25.

⁴⁴ Yang & Fang, *supra* note 37, at 25.

The mining operations on Dabao Mountain have eroded the soil, causing severe heavy metal contamination of the river and surrounding land. In a scientific study of the Hengshi River's water quality, the concentrations of zinc were sixteen times greater than Chinese national permit limits for irrigation water quality.⁴⁵ As a result of the contaminated river water, the soils are contaminated by heavy metals which in turn enhance the uptake of these heavy metal contaminants by crop plants.⁴⁶ For example, the concentration of cadmium in bananas grown in the region was 187 times greater than the Chinese national limit.⁴⁷ The U.S. Environmental Protection Agency considers cadmium a probable human carcinogen.⁴⁸ Other scientific studies demonstrated that no aquatic life could survive in the polluted waters for more than 24-hours even after the water had been diluted by a factor of 10,000.⁴⁹

The effect of the soil contamination on these villages has been severe. Scientists and villagers in Shangba, Liangxiao, and Tangxin believe that state-owned enterprises and private mining operations on the Dabao Mountain has caused the heavy metal contamination in these villages that have resulted in these high incident rates of cancer.⁵⁰ The residents of Shangba and the other villages have been living with and using this toxic water from the Hengshi River for

⁴⁵ Lin, *supra* note 41, at 472.

⁴⁶ *Id.*

⁴⁷ *Id.* at 472–73 (2005). Among the metal found in the local crops of Shangba, cadmium was the most prominent contamination among the heavy metal. *Id.* at 472.

⁴⁸ U.S. ENVTL. PROT. AGENCY, CADMIUM COMPOUNDS: HAZARD SUMMARY (2000), <http://www.epa.gov/ttn/atw/hlthef/cadmium.html>.

⁴⁹ Yang & Fang, *supra* note 37, at 25.

⁵⁰ See Lin, *supra* note 41, at 473 (“Discharge of acidic mine water from the Guangdong Dabaoshan Mine has caused severe ecological degradation in the downstream aquatic system . . . attributable to the improper management of the mine spoils at the mine site.”); Josephine Ma, *Bickering Mars Bid to Control Contamination*, CHINA MORNING POST, Dec. 7, 2000 (“[T]he problem originated from the Dabaoshan Mineral Mine and dozens of smaller privately run mines in the area.”); Qin Chuan, *Joint Mine Review Seeks Compliance*, CHINA DAILY, Sept. 2, 2004, http://www.chinadaily.com.cn/english/doc/2004-09/03/content_371371.htm (“[M]any small mining companies in Dabaoshan metal mines in Shaoguan, South China’s Guangdong Province, discharge sewage without treatment.”); Griffiths, *supra* note 37 (“Scientist Chen Nengchang . . . believes there is a direct connection between the incidents of cancer and the mining in the [Dabao Mountain] area.”); Craig Simons, *Cancer Clusters in Chinese Village Highlight Nation’s Environmental Woes*, THE TIMES ARGUS, Feb. 18, 2007 (“Villages in Liangqiao blame the Dabaoshan Mining Co., a giant iron and mineral mine owned by the provincial government, and a handful of smaller mines for dumping pollutants into the tributaries of the Laza River.”).

more than thirty years.⁵¹ One scientist from Guangdong Province Soil and Ecology Research Center believes that the mining situation on Dabao Mountain is “a textbook case of environmentally-caused cancer.”

Besides the alarming rates of cancer, the villagers have lost their livelihood as farmers. In Liangqiao, nothing will grow on their fields when they use water from the Hengshi River.⁵² In other villages like Shangba, rice yields are one-third the national average and few people will buy their rice.⁵³ Because of the contaminated crops, many villagers in Shangba do not eat the rice they grow but still attempt to sell it at the market to maintain an income for their families.⁵⁴ Others have decided to plant sugarcane as an alternative to rice crops not knowing that studies reveal that sugarcane grown in the contaminated soil contained concentration of cadmium 149 times greater than Chinese national public health limit.⁵⁵ The fishes they raised in ponds in Liangqiao died.⁵⁶ Doctors warned the villagers to not eat their own crops but because of the poverty, some subsistence farmers have no choice but to continue to irrigate with the polluted water and eat their crops.⁵⁷

The main polluter of the downstream villages is the state-run Dabaoshan Mining Corporation (“Dabaoshan”).⁵⁸ Dabaoshan began operating in 1970s to mine mainly copper and iron.⁵⁹ Soil from the Dabao Mountain is stripped of its copper and iron washes down the Dabao

⁵¹ Yang & Fang, *supra* note 37, at 25.

⁵² *Id.* at 28.

⁵³ *A Great Wall of Waste – China’s Environment*, *supra* note 39.

⁵⁴ Yang & Fang, *supra* note 37, at 28.

⁵⁵ Lin, *supra* note 41, at 472–73. Among the metal found in the local crops of Shangba, cadmium was the most prominent contamination among the heavy metal. *Id.* at 472.

⁵⁶ Craig Simons, *Cancer Clusters in Chinese Village Highlight Nation’s Environmental Woes*, THE TIMES ARGUS, Feb. 18, 2007.

⁵⁷ *Id.*

⁵⁸ Yang & Fang, *supra* note 37, at 27.

⁵⁹ Lin, *supra* note 41, at 464.

Mountain as acid mine drainage during rainfall.⁶⁰ This large volume of mining runoff containing high concentrations of sulfuric acid, cadmium, and lead flows into the Hengshi River and its tributaries.⁶¹

2. Past Remedial Actions and Compensation for Villagers in Wengyuan County

The Chinese government and villagers have tried to address the environmental and public health concerns related to the soil and water contamination from Dabaoshan's mining operations. Though Dabaoshan has denies that its ore-stripping operation contributes to the water and soil pollution, Dabaoshan constructed a kilometer-long mud embankment in an effort to divert heavy metal contaminated floodwaters and prevent soil erosion from polluting the Hengshi River.⁶² Unfortunately as a result of the severe soil erosion, the mud embankment has reached its capacity, and untreated mine water overflows continuously and directly into the Hengshi River at rates 1,000 times greater than the national permit limits for sulfuric acid.⁶³ Dabaoshan is planning to invest money to raise the height of the mud embankment but the addition height will only temporarily prevent soil erosion for a few more years.⁶⁴

Although powerless to stop the alarming rate of soil erosion from Dabaoshan's mining practices, some villages have achieved some success in obtaining clean drinking and irrigation water to villagers. In 2005, the Shangba villagers succeeded in getting the provincial government to build a reservoir to provide potable water to the villagers.⁶⁵ After a difficult multi-year process of obtaining the 14.29 million *yuan* (about \$1.8 million) necessary to build the reservoir, experts are still concerned that the reservoir's capacity will not be enough to

⁶⁰ Yang & Fang, *supra* note 37, at 27.

⁶¹ *Id.*

⁶² *Id.*; Lin, *supra* note 41, at 464.

⁶³ Yang & Fang, *supra* note 37, at 28; Lin, *supra* note 41, at 464.

⁶⁴ Yang & Fang, *supra* note 37, at 27.

⁶⁵ *Id.* at 28.

irrigate the 2,000 mu of farmland in Shangba.⁶⁶ Even though the reservoir is near completion, the Shangba villagers will still have to shoulder the significant costs of laying pipes to bring water from the reservoir to their homes.⁶⁷

Other villages like Liangqiao, closest to Dabaoshan's mining operations, have more limited options for clean water. Liangqiao villagers cannot benefit from the new Shangba reservoir because it sits too low.⁶⁸ Instead, families Liangqiao must pay thousands of *yuan* to lay plastic pipes to bring clean water from Dabao Mountain's Yangmei Cavern – a heavy cost for Liangxiao villagers who are poorer and suffer more serious pollution than villagers in Shangba.⁶⁹

Despite the extensive pollution on their farmlands, the villagers get little compensation from the Dabaoshan or the government. Beginning in the 1980s, the villagers have turned to their local county environmental protection bureau to assess the soil contamination and request compensation from the Dabaoshan for their loss of farmland and polluted water supply.⁷⁰ As a result of this negotiation, Dabaoshan agreed to compensate the villagers 11.09 *yuan* for each mu per year for the contaminated farmlands based on the amount of farmland and the biannual crop harvest.⁷¹

However the level of compensation has decreased over time as Dabaoshan continues to operate and pollute. Since 1987, the compensation amount has decreased to 7 *yuan* for each mu per year. Specifically, Tangxin village initially received a total yearly compensation of 15,526 *yuan* per year for the 700 mu farmland contaminated by the mining pollution.⁷² But now the

⁶⁶ *Id.* The Guangdong provincial government contributed 4.29 million *yuan*, and the Shaoguan city government and Dabaoshan Mining Co. provided 5 million *yuan* each to build the reservoir for Shangba. *Id.*

⁶⁷ *Id.*

⁶⁸ *Id.*

⁶⁹ *Id.*

⁷⁰ Complaint, Tangxin Villagers Committee v. Dabaoshan, No. 310 (Shaoguan City, Qujiang Dist. People's Ct., June 18, 2006) [hereinafter Complaint].

⁷¹ *Id.*

⁷² *Id.*

current rate of compensation for more than 1,000 Tangxin villagers is 9,800 *yuan* per year.⁷³ It is unclear why and how this new compensation amount was calculated by the local Wengyuan County EPB.⁷⁴ Even though the pollution has gotten worse over time, this compensation amount has not been changed for almost twenty years.⁷⁵ To put these compensation amounts in context, the current rate of compensation for Shangba is 11 *yuan* per villager per year (about \$2.76 per villager per year) while the annual income for the past decade is 1,500 *yuan* per person (about \$188), almost three times less than the average income in the Guangdong province.⁷⁶

After repeated failed attempts to renegotiate with Dabaoshan for greater compensation, Tangxin villagers filed a suit against Dabaoshan on June 6, 2006 for compensation of 480,200 *yuan* per year (about \$60,250) for polluted farmland and 123,000 *yuan* (about \$15,432) for a polluted pond.⁷⁷ At this time, the court has not set a date to schedule a trial. Also, Liangqiao villagers are planning to sue Dabaoshan but they fear that this process will take years and will result in little compensation in comparison to the extent of harm done to their lives and their farmland.⁷⁸

Bringing a suit against Dabaoshan presents many challenges and burdens for the Tangxin and other rural area villagers. To initiate a civil suit, a litigant is required to pay a court fee in

⁷³ Yang & Fang, *supra* note 37, at 28.

⁷⁴ One source reports that the compensation amount is based on document issued by the Shaoguan City government in 1995. Dabaoshan paid a total amount of 80,000 *yuan* per year (US\$10,037 per year) to the Wengyuan County environmental protection bureau government who allocated the money to the villages downstream of the Dabaoshan. Yang & Fang, *supra* note 37, at 28.

⁷⁵ *Id.*

⁷⁶ *A Great Wall of Waste – China’s Environment*, *supra* note 39.

⁷⁷ The compensation amount was calculated by accounting for the income lost and cost of farming. The farmers harvest twice a year. Each harvest produces 350 kilograms of crop per unit, totally 700 kilogram crop for each unit each year. One hundred kilogram crop is worth 140 *yuan*, so the income of the rice paddy field for each unit each year is 980 *yuan*. For costs, each unit each year requires seeds (40 *yuan*), pesticides (40 *yuan*), and chemical fertilizers (200 *yuan*). Totaling these three costs adds 280 *yuan* for each unit each year. So the total requested compensation is 686 *yuan* for each unit each year (700 *yuan* per unit each year from the combined income loss plus costs minus Dabaoshan current compensation of 14RMB each unit each year). Complaint, Tangxin Villagers Committee v. Dabaoshan, No. 310 (Shaoguan City, Qujiang Dist. People’s Ct., June 18, 2006).

⁷⁸ Simons, *supra* note 56.

proportion to the amount of compensation requested.⁷⁹ To pay for the court fees of only one year of compensation, every Tangxin villager must contribute 5 *yuan* to initiate the litigation and will have to pay further expenses in hiring a lawyer, expert fees, and other litigation costs.⁸⁰ In addition, the villagers may have difficulties proving causation since they lack medical records of their illnesses.⁸¹ The primary evidence will be their own testimony regarding the causality between the pollution and the injuries.⁸²

The Guangdong provincial government is considering closing Dabaoshan but that decision is not definite,⁸³ and villagers have little faith that the government will actually close the profitable Dabaoshan mining operation.⁸⁴ If the rate of pollution continues, the farmlands in Tangxin will be extinct.⁸⁵ Recognizing that farmers have suffered from these types of pollution, the central government committed 32 billion *yuan* (about \$4 billion) to provide access to clean drinking water to 160 million Chinese farmers by 2010.⁸⁶ In the meantime, Dabaoshan continues its mining operations, and the pollution is increasing.

The Cancer Villages case study highlights the deadly consequences of polluting industries and the inadequacies of the current Chinese legal system in remedying the pollution and compensating the injured villagers. This case study also illustrates the short fall of litigation and voluntary and involuntary administrative measures that villagers, government, and the mining enterprise have pursued in attempting to address the environmental, economic, and public

⁷⁹ Civil Procedure Law (promulgated by the Standing Comm. Nat'l People's Cong., Apr. 9, 1991, effective Apr. 9, 1991), art. 107, *translated in Chinese Legislative Information Network System* (1991).

⁸⁰ Complaint, *supra* note 70.

⁸¹ *Id.*

⁸² *Id.*

⁸³ *Shaoguan City: Hope to Close Dabaoshan*, SINA, Dec. 30, 2005, <http://finance.sina.com.cn> (translated by author).

⁸⁴ Rupert Wingfield-Hayes, *China's Mines Blight Rural Lives*, BBC NEWS, Feb. 2, 2002, <http://news.bbc.co.uk/2/hi/asia-pacific/1804614.stm>.

⁸⁵ Complaint, *supra* note 70.

⁸⁶ *More Farmers to Bid Farewell to Unhealthy Drinking Water*, CHINA DAILY, Jan. 8, 2007, http://www.chinadaily.com.cn/chinagate/doc/2007-01/08/content_776956.htm.

health effects of soil pollution. To tackle the soil pollution crisis, the Chinese government should develop a sustainable soil remediation and compensation program to accomplish three primary goals: (1) remediate contaminated soil; (2) provide methods for villagers to be compensated for their personal and economic injuries; and (3) develop adequate enforcement mechanisms on national and local levels to prevent pollution and ensure proper and timely remediation.

To determine the most effective ways to address China's soil pollution crisis, this Article will give a brief and basic background of the Chinese legal structure for environmental protection and then examine U.S. regulatory programs related to soil pollution that may be useful in adopting a regulatory system to remediate areas and compensate for injuries like those in the Cancer Villages.

II. CHINA'S LEGAL FRAMEWORK

A. *Basic Governmental Structure*

The Chinese government system is a multi-layered structure with political divisions at the national, provincial, city, county, and township and village levels.⁸⁷ The National People's Congress ("NPC") is the highest branch of state power as the legislative body in China.⁸⁸ The NPC has the power to amend the Chinese Constitution, create the fundamental national statutes, and establish government institutions.⁸⁹ The Standing Committee of the NPC is authorized to enact and amend all national laws except for those reserved to the NPC.⁹⁰ The State Council is the highest administrative body as the executive authority of the NPC.⁹¹ The State Council has

⁸⁷ Abigail R. Jahiel, *The Organization of Environmental Protection in China*, in *MANAGING THE CHINESE ENVIRONMENT* 33, 34 (Richard Louis Edmonds, ed. 2000).

⁸⁸ XIAN FA [CONSTITUTION OF THE PEOPLE'S REPUBLIC OF CHINA], art. 58 (1982) [hereinafter CHINA CONSTITUTION].

⁸⁹ *Id.* art. 62.

⁹⁰ *Id.* art. 67.

⁹¹ *Id.* art. 85.

the authority to approve and promulgate administrative regulations as well as draft and refer laws to the NPC and its Standing Committee.⁹² China's judicial branch includes the Supreme People's Court, the highest judicial body, and the Supreme People's Procuratorate, the highest prosecutorial body.⁹³ These judicial bodies are similar to the U.S. Supreme Court and the U.S. Attorney's Office, respectively, in terms of responsibilities though not with respect to independence from the other branches of government.

The structure of the national government is typically replicated in form and function in the lower levels of government.⁹⁴ For example, in provinces and municipalities below the national government, the local people's Congress is the main source of legislative power and the local People's Government is the executive body of local People's Congress.⁹⁵ Though the local People's Congresses and governments are required to report legal measures and regulations to the national government,⁹⁶ the local governmental bodies rarely do so, leaving the national government unable to ensure that local measures conform to national laws and regulations.⁹⁷

B. Framework of Environmental Protection Laws and Regulations

Unlike the U.S. Constitution, China's Constitution explicitly requires the state to protect the environment, eliminate pollution, and "ensure the rational use of natural resources."⁹⁸ Environmental protection is regulated on the national, province, city, county, and township, and village levels.⁹⁹ On the national level, the State Environmental Protection Administration ("SEPA") is under the leadership of the State Council and is the chief agency addressing

⁹² *Id.* art. 89.

⁹³ *Id.* arts. 124, 130, 132.

⁹⁴ Jahiel, *supra* note 87, at, 34.

⁹⁵ CHINA CONSTITUTION, arts. 95–111.

⁹⁶ CHINA CONSTITUTION, art. 100.

⁹⁷ Richard J. Ferris & HongJun Zhang, *Reaching Out to the Rule of Law: China's Continuing Efforts to Develop an Effective Environmental Regime*, 11 WM. & MARY BILL OF RTS. 569, 586 (2003).

⁹⁸ CHINA CONSTITUTION, arts. 9, 26.

⁹⁹ Jahiel, *supra* note 87, 34.

environmental concerns.¹⁰⁰ The Environmental Protection and National Resources Conservation Committee under the NPC¹⁰¹ and environmental committees under the local People's Congresses propose local environmental laws.¹⁰² The Environmental Protection Bureaus ("EPBs") are the primary local administrative agencies responsible for enforcing the national and local laws and policies, setting local pollution standards, and mediating environmental disputes.¹⁰³

EPBs have a crucial role in protecting China's environment. China has over 2,500 EPBs with approximately 60,000 employees above the village and township levels.¹⁰⁴ Because of the decentralized nature of the Chinese government, the national SEPA has a difficult time implementing national policies since it does not directly employ any staff on the local government level.¹⁰⁵ Because the local EPBs are funded by and directly responsible to the local People's Government, not to the SEPA, the EPBs are completely dependant on the local government's economic concerns and priorities when regulating local enterprises.¹⁰⁶ EPBs vary in size, funding, staff expertise, and work methods in different parts of the country.¹⁰⁷ Wealthier provinces have more funds available for environmental protection than poorer and remote regions.¹⁰⁸ Poorer provinces have greater difficulty in attracting technical staff because the low salaries.¹⁰⁹ Because of local politics, geographic isolation from the national government, and

¹⁰⁰ *Id.*

¹⁰¹ Richard J. Ferris & HongJun Zhang, *The Challenges of Reforming an Environmental Legal Culture: Assessing the Status Quo and Looking at Post-WTO Admission Challenges for the People's Republic of China*, 14 GEO. INT'L L. REV. 429, 435 (2002).

¹⁰² XIAOYING MA & LEONARD ORTOLANO, ENVIRONMENTAL REGULATION IN CHINA 55 (2000).

¹⁰³ Jahiel, *supra* note 87, at 37.

¹⁰⁴ ECONOMY, *supra* note 35, at 108.

¹⁰⁵ *A Great Wall of Waste – China's Environment*, *supra* note 39.

¹⁰⁶ Jahiel, *supra* note 87, at 35. In theory, the local EPB are still responsible to the national SEPA for implementing law and policy but it practically, the local People's Government holds power of staffing, funding, allocating of resources over the local EPB. *Id.*

¹⁰⁷ *Id.*

¹⁰⁸ *Id.*

¹⁰⁹ *Id.*

resources, it is not surprising that the level of environmental protection significantly varies throughout China.

C. Summary of Current Laws that Address China's soil pollution

China has enacted a significant body of environmental laws and regulations, including about twenty national statutes, more than forty regulations, approximately 500 environmental standards, and more than 600 other legal measures addressing pollution control, conservation, and product stewardship.¹¹⁰ China has also entered the global arena for environmental protection. China has signed onto at least thirty international environmental conventions¹¹¹ and became the 143rd member of the World Trade Organization which impose obligations on notice of environmental standards, greater public participation in legislation, and improved enforcement of laws.¹¹²

China has four main laws and regulations that have provisions related to soil pollution in China: (1) Environmental Protection Law; (2) Agriculture Law; (3) Land Administration Law; and (4) Regulations on the Protection of Basic Farmland.¹¹³ In addition, China has some laws and regulations that address environmental protection in rural places but not specifically for soil protection.¹¹⁴ These laws and regulations play an important role in building a legal foundation for soil protection in China.

¹¹⁰ Ferris & Zhang, *supra* note 97, at 581.

¹¹¹ See State Entvl. Prot. Admin., International Cooperation, <http://english.sepa.gov.cn/gjhz/index.htm> (last visited March 22, 2007) (listing China's international environmental conventions).

¹¹² Ferris & Zhang, *supra* note 101, at 431.

¹¹³ Environmental Protection Law (promulgated by the Standing Comm. Nat'l People's Cong., Dec. 26, 1989 effective Dec. 26, 1989); Agriculture Law (promulgated by the Standing Comm. Nat'l People's Cong., July 2, 1993); Land Administration Law (promulgated by the Standing Comm. Nat'l People's Cong., June 25, 1986, effective Jan, 1, 1999); Regulations on the Protection of Basic Farmland (promulgated by the State Council Nat'l People's Cong., Dec. 27, 1998).

¹¹⁴ For example, other regulations include village and town enterprises laws; regulations regarding enhancing the environmental protection work of village and town enterprises; decisions regarding certain questions of environmental protection; decisions regarding environmental protection work; and regulations regarding programming and construction in village and town.

Unfortunately, there remain many issues and challenges with these soil protection laws. China has too few laws and regulations dealing with soil pollution. Except for the Regulations on the Protection of Basic Farmland, there are few articles concerning soil protection in the other three environmental statutes.¹¹⁵ The provisions that do address soil pollution are vague and generalized. For example, the Environmental Protection Law states that “[p]eople’s governments at various levels shall provide better protection for the agricultural environment by preventing and controlling soil pollution . . .”¹¹⁶ Even the Regulations on the Protection of Basic Farmland that implement the Land Administration Law and Agricultural Law fail to specify what measures should be taken to protect the environment and soil. For example, only two provisions address environmental protection of soil in general and broad provisions.¹¹⁷ Furthermore, the majority of China’s soil protection legislation is about the prevention of the soil pollution with only a few regulations dealing with contaminated soil disposal and remedies for soil pollution. The Standing Committee of the NPC is planning to draft legislation to primarily address soil pollution prevention not soil pollution remedies.¹¹⁸ To remedy land contamination and seek compensation, farmers affected by soil pollution are protected under the general provisions of the statutes and regulations mentioned above, soil quality standards,¹¹⁹ the civil

¹¹⁵ Of the three major environmental statutes, Articles 7, 10, and 44 of the Environmental Protection Law; articles 4, 6, 17, 38, 39, 57, and 58 of the Agriculture Law; and articles 35, 38, and 39 of the Land Administration Law address soil pollution.

¹¹⁶ Environmental Protection Law, art. 20.

¹¹⁷ See Regulations on the Protection of Basic Farmland, arts. 23, 26 (1998) (“Competent departments of people’s governments above the county level should . . . carry out monitoring and evaluation of environmental pollution in basic farmland, and submit reports on the quality of environment . . .”)

¹¹⁸ *The Time to Constitute Soil Pollution Prevention Law is Staring in the Face*, SOUTH CHINA NEWS, Nov. 16, 2005 (translated by author).

<http://www.people.com.cn/GB/paper49/16158/1427782.html>

¹¹⁹ State Entvl. Prot. Admin, Environmental Quality Standard for Soils (1996).

rights protection legislation, referred to as the General Principles of Civil Law,¹²⁰ and other administrative remedies that will be addressed below.

Now that China has begun to survey the full extent of soil pollution and its effects, China could benefit from survey regulatory programs and laws in other countries like the United States to see how other countries have remedied soil pollution and compensated soil pollution victims. Faced with similar pollution issues, the United States enacted environmental laws such as the Comprehensive Environmental Response, Compensation and Liability Act (“CERCLA”) and the Small Business Relief and Brownfields Revitalization Act (“Brownfields Act”) to facilitate the financing of cleanup activities though strict liability provisions while provide monetary incentives for revitalizing contaminated lands. In addition, enforcement of environmental laws in the United States has significantly affected the extent of environmental protection at both the national and regional levels.

III. APPLYING U.S. SOIL POLLUTION REMEDIES TO CHINA’S SOIL POLLUTION CRISIS

The United States has suffered from various forms of soil pollution. Some of the major sources of U.S. soil contamination and pollution are: ruptured underground storage tanks; hazardous substance spills; leaching contaminants from solid waste disposal sites; polluted water run off; and pesticides and herbicides uses.¹²¹ The United States was the first country to pass major legislation that specifically addressed remediation of contaminated land and other hazardous waste sites.¹²² In the late 1970s, hazardous waste incidents made it evident to U.S. Congress that the U.S. Environmental Protection Agency (“EPA”) lacked the authority to clean

¹²⁰ See General Principles of the Civil Law, Nat. People’s Cong., 1987, art. 124 (“Any person who pollutes the environment and causes damage to others in violation of state provisions for environmental protection and the prevention of pollution shall bear civil liability in accordance with the law.”).

¹²¹ RAYMOND N. YONG, GEOENVIRONMENTAL ENGINEERING: CONTAMINATED SOILS, POLLUTANT FATE, AND MITIGATION 5, 8 (2001).

¹²² MEYER, *supra* note 8, at 9.

up the hazardous waste at inactive sites that damaged the environment and threatened public health.¹²³

A. Developing a Program to Finance Soil Remediation

1. An Overview of Comprehensive Environmental Response, Compensation, and Liability Act

In 1980, the U.S. Congress enacted Comprehensive Environmental Response, Compensation, and Liability Act (“CERCLA”) with two primary goals: to provide prompt and effective cleanup of hazardous waste sites that threatened public health; and to require the responsible parties to share in the cleanup costs of these sites.¹²⁴ To achieve these goals, CERCLA provides for a two-pronged approach: (1) hold parties responsible for the contamination strictly liable for cleanup costs; and (2) create a trust fund to pay for site cleanup where the responsible party could not be identified or could not pay for the cleanup costs. Under CERCLA’s provisions, the state or federal government or a private party may cleanup a contaminated site and recover the costs of the cleanup from a potentially responsible party (“PRP”) that has incurred the cleanup response costs.¹²⁵ A PRP is liable for four types of costs: (1) cleanup costs incurred by the government; (2) cleanup costs incurred by a private entity; (3) assessment of and damages for injury to natural resources; and (4) costs of health assessments or effects studies conducted by a government.¹²⁶

To establish CERCLA liability for these cleanup costs, a plaintiff must prove that there has been a release or threatened release of hazardous substances from a facility that caused the

¹²³ U.S. ENVTL. PROT. AGENCY, FY 2004 SUPERFUND ANNUAL REPORT 1 (2004).

¹²⁴ JOHN HYSON, PRIVATE COSTS RECOVERY ACTIONS UNDER CERCLA 15 (2003). *See* Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA) (1980), Pub. L. No. 96-510, 94 Stat. 2767 (codified at 42 U.S.C. 9601-57 (2006)) (“An Act [t]o provide for liability, compensation, cleanup, and emergency response for hazardous substances released into the environment and the cleanup of inactive hazardous waste disposal sites.”).

¹²⁵ HYSON, *supra* note 124, at 15.

¹²⁶ Comprehensive Environmental Response, Compensation and Liability, 42 U.S.C. § 9607(a) (2006).

plaintiff to incur cleanup costs.¹²⁷ The four categories of PRPs are (1) a current owner or operator of the the contaminating facility; (2) a previous owner or operator the facility at the time of hazardous waste disposal; (3) an arranger for disposal or treatment of hazardous waste at the facility; and (4) a transporter of hazardous substances to a chosen facility.¹²⁸ These categories are broadly defined to include an “individual, firm, corporation, association, partnership, consortium, joint venture, commercial entity, United States Government, State, municipality, commission, political subdivision of a State, or any interstate body.”¹²⁹ Congress intended to broadly hold all parties within the hazardous waste chain responsible to prevent parties from “contracting away” their responsibilities to properly handle and disposal of hazardous substances or casting blame on a third party.¹³⁰

2. The Superfund: the Trust Fund of CERCLA

To develop a viable soil remediation program, China must determine how the government¹³¹ will finance cleanup of contaminated land. The CERCLA program follows the polluter-pays principle to finance remediation costs and to give governmental agencies flexibility in recouping those costs. Under CERCLA’s regulatory scheme, EPA has three primary ways of financing the cleanup a contaminated site: (1) EPA uses money from the Superfund to clean up the site; (2) EPA can order one or more PRPs to implement and pay for the selected remedial action;¹³² or (3) EPA can enter into a settlement agreement with one or more PRPs where the

¹²⁷ *Id.* § 9607(a)(4).

¹²⁸ *Id.* § 9607(a)(1)–(4).

¹²⁹ *Id.* § 9601(21).

¹³⁰ S. REP. NO. 96-848, at 31 (1980).

¹³¹ This Article will focus on the government as the primary party cleaning up contaminated sites since governmental action is most relevant to China’s soil contamination issue. Under U.S. laws, private parties can bring a recovery action, known as a contribution claim against another private party for costs incurred in clean up contaminated sites. 42 U.S.C. § 9613(f) (2006). Villages such at those in the Cancer Villagers are not likely to be in a position to clean up the pollution and then seek contribution from state-owned enterprises such as Dabaoshan.

¹³² *Id.* § 9607(c)(3).

PRPs will agree to implement the remedial action or contribute money towards financing the remedial action.¹³³

Under the first method, EPA can select a site and implement the cleanup action by using money from the Hazardous Substance Trust Fund (“Superfund”). Congress established the Superfund to cover the costs of federal cleanup activities when the responsible party does not or cannot pay.¹³⁴ The Superfund was financed through taxes on industry, and a percentage of the Superfund is set aside to reimburse local governments to help offset costs involved with the cleanup of hazardous substance releases.¹³⁵ After the money has been expended from the Superfund for cleanup activities, EPA can bring a suit to recover those cost against one or more PRPs.¹³⁶ In cases where EPA cannot identify a PRP or the PRP is insolvent, the EPA will use the Superfund to pick up these “orphan shares.”¹³⁷

B. Creating a China Superfund

With an abundance of environmental laws that lack adequate implementation or enforcement, the Chinese government may find success in revising or amending an existing regulatory program to finance remediation that is similar to the Superfund. For example, China has implemented a pollution discharge fee system for over twenty years where fees are held in an Environmental Protection Special Fund at the different government levels.¹³⁸ A majority of China’s provinces and municipalities have implemented the fee system and approximately 500,000 enterprises have been charged a pollution discharge fee.¹³⁹

¹³³ *Id.* § 9622.

¹³⁴ 26 U.S.C. § 9507 (2006); 42 U.S.C. § 9611 (2006).

¹³⁵ U.S. Env’tl. Prot. Agency, Superfund, Who Pays?, <http://www.epa.gov/superfund/programs/er/whopays.htm>.

¹³⁶ 42 U.S.C. § 9607 (2006).

¹³⁷ ROBERT V. PERCIVAL ET AL., ENVIRONMENTAL REGULATION: LAW, SCIENCE, AND POLICY 272 (4th ed. 2003).

¹³⁸ Hua Wang, *Pollution Charge, Community Pressure and Abatement Cost: An Analysis of Chinese Industries*, Working Paper, at 5 (World Bank 2000).

¹³⁹ *Id.*

Under the Environmental Protection Law, all enterprises must pay a fee for all discharging air or water pollutants that violate air and water emission standards.¹⁴⁰ Currently, discharge fees are imposed on water, air, and noise pollution as well as solid waste disposal.¹⁴¹ Fees are calculated for each pollutant and the polluter is only required to pay a fee the pollutant which exceeds the emissions standards the most.¹⁴² China imposes an additional fee based on the wastewater discharge flow-rate regardless of whether the enterprise has exceeded the wastewater discharge limits.¹⁴³ But an enterprise that has paid their volume-based discharge fee is not required to pay for an excessive discharge of wastewater that exceeds the wastewater discharge limits.¹⁴⁴ The national government sets a uniform fee schedule but local governments are allowed to vary the fees, resulting in a non-uniform application of the fee system.¹⁴⁵

The pollution fee system for excess discharges has four additional penalty fines: (1) a 5 percent fee increase for enterprises that exceed discharge limits for three consecutive years until the enterprise meets the discharge limits; (2) double the fines for all enterprise built after 1979 or failing to comply with pollution control administrative orders; (3) a late payment fee of 0.1 percent per day; and (4) a fine to compensate for adverse economic or public health effects of water pollution.¹⁴⁶ The fees and fines collected through the pollution discharge fee system are placed into the Environmental Protection Special Fund (“Special Fund”). According to 2005 national statistics, the total discharge fees collected into the Special Funds at both the national

¹⁴⁰ Environmental Protection Law, art. 28.

¹⁴¹ Benjamin Richardson, *Is the East Asia Industrializing Too Quickly? Environmental Regulation in its Special Economic Zones*, 22 UCLA PAC. BASIN L. J. 150, 234 (2004).

¹⁴² Wang, *supra* note 138, at 8.

¹⁴³ Qinghing Pu, *Integrated Strategies to Control Industrial Water Pollution in the Yangtze River in China*, International Conference of GIS and Remote Sensing in Hydrology, Water Resources and Environment, China, Sept. 3, 2003.

¹⁴⁴ XIAOYING MA & LEONARD ORTOLANO, ENVIRONMENTAL REGULATION IN CHINA 22 (2000). “The volume-based fee is calculated by multiplying the discharge flowrate (tons/day) by 0.05 yuan/ton.” *Id.*

¹⁴⁵ Wang, *supra* note 138, at 9; Jolene Lin Shuwen, *Assessing the Dragon’s Choice: the Use of Market-Based Instruments in Chinese Environmental Policy*, 16 GEO. INT’L ENVTL. L. REV. 617, 650 (2004).

¹⁴⁶ MA & ORTOLANO, *supra* note 144, at 21.

and local levels were 12.32 billion *yuan* (\$1.5 billion).¹⁴⁷ In comparison, the U.S. EPA Superfund budget for 2005 was \$1.2 billion.¹⁴⁸ Though similar, these dollar amounts do not take into context the vast difference in size, population, and socio-economic differences between the United States and China.¹⁴⁹

The Special Fund is housed under the Ministry of Finance budget and is managed by both the Ministry of Finance and SEPA.¹⁵⁰ The Special Fund can only be used for allocation assistance and loans with subsidized interest for the following pollution abatement projects: (1) control of key pollution sources; (2) control of regional pollution; (3) the exploration, demonstration, and application of new pollution control techniques; and (4) other pollution control programs stipulated by the State Council.¹⁵¹ According to the regulations, 10 percent of the pollutant discharge fees should be submitted to the national government to be maintained as the national Special Fund and the remaining funds are maintained by the local government who is responsible for collecting fees in their region.¹⁵² Eighty percent of the remaining fees is placed in the Special Fund at the local levels and is used to allocate grants and low-interest or subsidized-interest loans for pollution control projects at the facilities that have paid discharge fees.¹⁵³ Enterprises are allowed to borrow up to 80 percent of the fees (but not the four types of additional penalty fines¹⁵⁴) that are paid to the local EPBs.¹⁵⁵ The remaining 10 percent of the fees are used to finance the local EPBs.¹⁵⁶

¹⁴⁷ STATE ENVTL. PROT. ADMIN., STATISTIC BULLETIN OF NATIONAL ENVIRONMENTAL STATUS (2005), http://www.sepa.gov.cn/plan/hjtj/qghjtjgb/200606/t20060612_77318.htm (translated by author).

¹⁴⁸ U.S. Env'tl. Prot. Agency, Superfund Appropriation History (2005) <http://www.epa.gov/superfund/action/process/budgethistory.htm>.

¹⁴⁹ It is difficult to determine the best method to normalize the amounts to reflect the value of the Funds in relation to pollution control and remediation costs.

¹⁵⁰ Management of the Imposition and Use of the Pollutant Discharge Fee Fund.

¹⁵¹ Regulations on the imposition and use of the pollutant discharge fee, art. 18 (translated by author)

¹⁵² Management of the Imposition and Use of the Pollutant Discharge Fee Fund.

¹⁵³ MA & ORTOLANO, *supra* note 144, at 21–22.

¹⁵⁴ Wang, *supra* note 138, at 9.

In theory, an economic incentive program such as the pollution discharge fee system and the Special Fund could be effective in reducing air and water pollution, but the national and local government's implementation of the Special Fund has had limited success.¹⁵⁷ In general, the pollution discharge fees are not high enough to deter pollution practices. For example, the average costs of treating industrial wastewater are 30-40 cents per ton in contrast to the fee of 10 cents per ton of wastewater over the discharge limit.¹⁵⁸ This problem is exacerbated by the government's unwillingness to raise the pollution discharge fees from their 1991 rates. Increasing the discharge fee reduces tax revenues for the local government because the fees are calculated as part of production costs which are not taxed.¹⁵⁹ Furthermore, enterprises either try to overpay their pollution discharge fees to reduce tax liabilities or enterprises do not pay their discharge fees at all since the penalty for late discharge fees are minimal.¹⁶⁰

The most difficult problem has been the management and use of the fee revenues in the Special Fund. Because local EPBs lack the resources or incentives to monitor how the funds are being spent, most of the money given back to the enterprises for pollution abatement projects are being used for non-environmental purposes.¹⁶¹ In addition, between 1981-1996, over 13 percent of the money in the Special Fund was "illegally hoarded" by some governmental agencies.¹⁶² In rural areas such as the Cancer Villages, small industries have escaped paying discharge fees entirely because of the weak enforcement by EPBs.¹⁶³

¹⁵⁵ XIAOYING MA AND LEONARD ORTOLANO, ENVIRONMENTAL REGULATION IN CHINA 22 (2000).

¹⁵⁶ Shuwen, *supra* note 145, at 650.

¹⁵⁷ Compare Wang, *supra* note 138, at 9 ("China's levy system has been working much better than previously thought.") with Shuwen, *supra* note 145, at 648-49 ("It is also commonly believed that the [discharge fees] have little, if any, incentive effect because they are far below marginal abatement costs.").

¹⁵⁸ Shuwen, *supra* note 145, at 651.

¹⁵⁹ *Id.*

¹⁶⁰ *Id.* at, 651-52.

¹⁶¹ *Id.* at 651.

¹⁶² *Id.*

¹⁶³ Wang, *supra* note 138, at 8.

Unfortunately, the new regulations¹⁶⁴ that address the administration and use of the Special Fund do not fix or provide guidance on how to resolve the problems with the collection, use, and management of the Special Fund. The regulations provide overarching goals for the use of the pollution discharge fees and broadly define how the Special Fund should be managed. Local governments are allowed to change the management and fee requirements set out by the national government.¹⁶⁵ Unfortunately, the local regulations are quite similar to the national regulations and fail to meet the local needs and political situations.¹⁶⁶

Shenzhen City in the Guangdong Province is one of the few cities or municipalities to enact specific regulations on the use and management of the local Special Fund. Issued on November 13, 2006, the regulation provides specific management duties of the local finance department and environmental protection bureaus, clear application and review procedures for an enterprise to use the Special Fund, and criteria for pollution abatement projects that may qualify for allocation assistance and loans from the Special Fund.¹⁶⁷ Though these regulations in Shenzhen City take a step forward in implementing stricter management of the Special Fund, the efforts of one local government will not correct the inherent flaws in the entire Special Fund and pollution discharge fee system.

Based on the problems that plague the pollution discharge fee system and the Special Fund, China could revise and amend these existing regulatory programs to start a soil

¹⁶⁴ *Regulations on the Imposition and Use of the Pollutant Discharge Fee* was enacted by the State Council on July 1, 2003; *Management of the Imposition and Use of the Pollutant Discharge Fee Fund*, was enacted by the Ministry of Finance and the State Environmental Protection Administration

¹⁶⁵ Shuwen, *supra* note 145, at 650.

¹⁶⁶ Wang Canfa, *Principals and Ways of Reifying National Regulations on Pollutant Discharge Fee by Local Legislation*, LEGAL SYSTEM & MGMT., at 9 (translated by author).

¹⁶⁷ Shenzhen City Regulations, *Management Means on the Use of the Environmental Protection Special Fund*, Nov. 13, 2006. For example, the regulation provisions include two key conditions for a qualified pollution abatement project. The construction phase of all projects is limited to two years, and the owner of the enterprise must pay for at least 60 percent of the total investment for the project. The maximum allocation assistance for each project is 6 million *yuan* (\$758,000), while the maximum loan amount with subsidized interest is 3 million *yuan* (\$380,000).

remediation program. Because the poor enforcement of the use and management of the Special Funds for pollution abatement projects, the Special Funds could be redirected toward soil remediation projects that are controlled directly by the national SEPA and local EPBs. Direct government control will ensure that the enterprises do not use the money for non-approved purposes. Since the discharge fee has proven to be a somewhat effective tool to prevent pollution, China should continue to build the Special Funds with these fees, implement stricter control over the enforcement of the fee; increase the fees to provide adequate incentive to reduce pollution, and remove any tax incentives for enterprises to not pay the fee. Redirecting the focus of the Special Fund and increasing enforcement of the fees may be the most effective way to start and finance a soil remediation program.

C. Other Administrative Remedies to Initiate and Finance Remediation

Under both the U.S. CERCLA program and the Chinese Environmental Protection Law, governmental agencies like the EPA and SEPA are authorized to issue administrative orders and fines to help clean up soil contamination. EPA can unilaterally order a PRP to remediate a contaminated site through a direct administrative order. Any person or PRP that fails to provide the ordered removal or remedial action may be liable for punitive damages up to three times the cleanup amount incurred by EPA.¹⁶⁸ Also, a PRP's failure to comply with an order issued by EPA may also subject it to a civil penalty of \$25,000 per day of violation of the order.¹⁶⁹

The last method EPA can use to clean up a contaminated site is to negotiate a settlement agreement with one or more PRPs.¹⁷⁰ To encourage settlement, EPA may provide PRPs willing to settle with a covenant not to sue for further cost associated with the remedial action identified

¹⁶⁸ *Id.* § 9607(c)(3).

¹⁶⁹ *Id.* § 9606(b)(1)

¹⁷⁰ *Id.* § 9622(a).

in the settlement agreement so long as it is in the public's interest.¹⁷¹ EPA can negotiate mixed funding agreements allowing EPA to settle with some PRPs at a site while continuing to pursue non-settling PRPs for cost recovery under a CERCLA action.¹⁷² Under the settlement agreement, when a private party conducts the clean up, EPA or an authorized state agency monitors the clean up to ensure compliance with the required remedial or removal standards. Through these methods, the federal government through EPA has a greater flexibility than a private party in how it can remediate contaminated sites.

China could adopt a similar regulatory scheme by using existing laws and programs to facilitate and finance remediation. Current Chinese laws authorize environmental government agencies to control soil pollution and compensate villagers affected by the pollution through administrative orders, penalties, and settlements as well.¹⁷³ The local government can require a polluting facility to eliminate and control the pollution within a certain period of time, impose a fine based on the damage incurred, or order to suspend polluting operations or close down the facility.¹⁷⁴ In addition, a polluting facility that has caused an environmental pollution hazard is required to eliminate the pollution and make compensation to those that suffered direct losses from the pollution.¹⁷⁵ The use of voluntary settlement agreements could be a useful tool for financing remediation as long as they are binding and properly enforced.

D. Soil Remediation on the Regional Level

As mentioned above, EPBs and local government bodies on the regional levels are responsible for the daily implementation and enforcement of environmental laws in China.

¹⁷¹ *Id.* § 9622(f).

¹⁷² *Id.* § 9622(b); 53 Fed. Reg. 8279 (Mar. 14, 1988).

¹⁷³ Environmental Protection Law, art. 41.

¹⁷⁴ *Id.* art. 39.

¹⁷⁵ *Id.* art. 41.

Because of China's decentralized environmental protection and enforcement structure, a soil remediation program should include funds and incentives for local government bodies to remediate, reclaim, and reuse contaminated sites to continue to meet economic goals. Giving the local government loans and funds will enable the government—not the enterprises—to be held accountable to national government for using the funds to remediate contaminated land. Currently, no such program exists in China.

In the United States, implementation of the CERCLA program on the regional level created unforeseen problems. Issues related to the broad reach of liability and unpredictable cleanup costs deterred developers from redeveloping brownfield sites.¹⁷⁶ A brownfield is an abandoned or underused industrial or commercial property where expansion, redevelopment, or reuse is complicated by the real or perceived presence of contamination that can add time, cost, or uncertainty to redeveloping that property.¹⁷⁷ In 2001, CERCLA was amended to include the Small Business Liability Relief and Brownfields Revitalization Act (the “Brownfields Act”) to encourage redevelopment of brownfields through: (1) financial grants; (2) providing liability protections to parties interested in acquiring and developing brownfields; and (3) providing protection from EPA liability to parties who participate in state-run brownfield cleanup programs.¹⁷⁸

¹⁷⁶ Wendy E. Wagner, *Overview of Federal and State Law Governing Brownfields Cleanups*, in *BROWNFIELDS: A COMPREHENSIVE GUIDE TO REDEVELOPING CONTAMINATED PROPERTY* 15, 25 (Todd S. Davis, ed., 2d ed. 2002).

¹⁷⁷ Todd S. Davis, *Defining the Brownfields Problem*, in *BROWNFIELDS: A COMPREHENSIVE GUIDE TO REDEVELOPING CONTAMINATED PROPERTY* 3, 5 (Todd S. Davis, ed., 2d ed. 2002); *see also* 42 U.S.C. § 101(39)(A) (2006) (defining a brownfield as a “real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant”).

¹⁷⁸ Small Business Liability Relief and Brownfields Revitalization Act, Pub. L. No. 118, 115 Stat. 2356 (2002); MICHAEL B. GERRARD & JOEL M. GROSS, *AMENDING CERCLA: THE POST-SARA AMENDMENTS TO THE COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION, AND LIABILITY ACT* 34 (2006).

The Brownfields Act established a grant program called “Brownfields revitalization funding” for assessing and cleaning up brownfield sites.¹⁷⁹ These funds are available to states, tribes, local governments, land-clearance authorities, regional councils, redevelopment agencies, and quasi-governmental entities to provide funds for brownfields remediation.¹⁸⁰ The grants can be used for site characterization and assessment, to provide grants to other governmental bodies or to nonprofit organizations, or to provide loans to a site owner or developer.¹⁸¹ Grant recipients generally need to provide a 20 percent matching share unless the matching share requirement would pose an undue hardship for the funding recipient.¹⁸²

In situations like the Cancer Villages, it is difficult to determine what geographic areas would be best suits for a brownsfield program. But there may be certain areas in China were local governments have more financial resources to begin a brownsfields program with subsidized loans from the national government. Because the population and size of China, a brownfields program may have more success than a larger, nationally administered program.

IV. CHANGING THE LIABILITY STANDARD FOR POLLUTERS

To sustain a remediation fund, the Chinese government cannot rely solely on money collected from the pollution discharge fee system. Any soil remediation program requires provisions for the government to recover cleanup costs and hold polluters liable for the contamination. The United States has taken an aggressive approach to recovering cleanup costs by applying strict liability to a broad class of PRPs and polluting activities. CERCLA codified the common law strict liability standards applied to cases involving abnormally dangerous

¹⁷⁹ See 42 U.S.C. § 9604(k) (2006) (authorizes \$200 million per year of grant funding through 2006).

¹⁸⁰ *Id.* § 9604(k)(1)–(3).

¹⁸¹ *Id.* § 9604(k)(2), (3)(A)–(B). Generally, the maximum grant award is \$1,000,000 for remediation and \$200,000 for brownfield site characterization and assessment per brownfield site. *Id.* § 9604(k)(4)(A).

¹⁸² *Id.* § 9604(k)(9)(B)(iii).

activities and materials.¹⁸³ Courts have uniformly held that CERCLA imposes joint and several liability on PRPs even though the statute does not expressly provide for it.¹⁸⁴ EPA does not have to prove that the defendant negligently or intentionally caused the hazardous waste release or threatened release.¹⁸⁵ Learning from past experiences dealing with oil spill liability, Congress determined that strict liability was necessary for the government to have a “realistic chance” of recovering cleanup costs.¹⁸⁶ The only defenses available are if the defendant can prove that the hazardous waste release and its subsequent damages are a result of an act of God; an act of war; or an act or omission of a third party.¹⁸⁷

The definition of “release” is intentionally broad to capture a wide net of polluting activities. A release includes any “spilling, leaking, pumping, pouring, emitting, discharging, injecting, escaping, leaching, dumping, or disposing into the environment.”¹⁸⁸ Courts have held that even migration of hazardous waste constitutes a disposal and therefore a release under CERCLA.¹⁸⁹ Threatened releases include a PRP’s ownership of corroding or deteriorating tanks holding hazardous substances, a PRP’s lack of experience in handling hazardous substances, or a PRP’s failure to obtain a license its facility.¹⁹⁰ A majority of courts have held that there is no “threshold quantity” of a hazardous substance to trigger CERCLA liability.¹⁹¹

¹⁸³ S. REP. NO 96-848, at 31–32.

¹⁸⁴ ROBERT V. PERCIVAL ET AL., ENVIRONMENTAL REGULATION: LAW, SCIENCE, AND POLICY 258 (4th ed. 2003).

¹⁸⁵ HYSOON, *supra* note 124, at 36; S. REP. NO 96-848, at 32.

¹⁸⁶ ROBERT V. PERCIVAL ET AL., ENVIRONMENTAL REGULATION: LAW, SCIENCE, AND POLICY 258 (4th ed. 2003).

¹⁸⁷ 42 U.S.C. § 9607(b) (2006).

¹⁸⁸ *Id.* § 9601(22) (2006). The definition of “release” also includes abandoned or discarded barrels so response actions could be compensated even though they were not leaking. *Id.*

¹⁸⁹ *See Nurad, Inc. v. William E. Hooper & Sons Co.*, 966 F.2d 837, 846 (4th Cir. 1992) (holding prior owner liable for “passive migration of hazardous substances may have occurred during his ownership”).

¹⁹⁰ *New York v. Shore Realty Corp.*, 759 F.2d 1032, 1045 (2d Cir 1985).

¹⁹¹ *United States v. Alcan Aluminum Corp.*, 964 F.2d 252, 260 (3d Cir. 1992); *see also Amoco Oil Co. v. Borden, Inc.*, 889 F.2d 664, 669 (5th Cir. 1989) (“The plain statutory language fails to impose any quantitative requirement on the term hazardous substance and we decline to imply that any is necessary.”); *City of New York v. Exxon Corp.*, 744 F. Supp. 474, 483 (S.D.N.Y. 1990) (“[L]iability under CERCLA attaches regardless of the concentration of the hazardous substances present in a defendant's waste so long as the defendant's waste and/or the contaminants in it are ‘listed hazardous substances’ . . .”).

CERCLA provides for recovery of two types of response costs—removal and remedial—that generally involve monitoring, evaluation, and cleaning up a release of hazardous waste.¹⁹² Removal actions tend to focus on eliminating sources of contamination to prevent further damage to the environment and public health while remedial actions generally focus on containing and remedying widespread contamination.¹⁹³ A plaintiff, whether a government entity or private party, may only recover costs that meet these definitions of “removal” or “remedial action.”¹⁹⁴

Since its enactment in 1980, CERCLA strict liability scheme has been interpreted, expanded, restricted, discussed, evaluated, and criticized in numerous court cases.¹⁹⁵ Unlike China’s civil law judicial system, EPA and other government agencies have a clearer sense on how to enforce the provisions of CERCLA through judicial interpretation and precedent. The strict liability scheme was also intended as an incentive PRPs to “voluntarily mitigate damages rather than simply rely on the government to abate hazards.”¹⁹⁶

CERCLA liability provisions are strict, broad, and specific while China’s laws only include general liability provision for polluters. Polluting enterprise “that has caused an environmental pollution hazard shall have the obligation to eliminate it and make compensation to the unit or individual that suffered direct losses.”¹⁹⁷ In addition, parties that have caused “damage to natural resources like land, forests, grasslands, water, minerals, fish, wild animals and wild plants shall

¹⁹² 42 U.S.C. § 9601(25) (2006).

¹⁹³ *Id.* §§ 9601(23)–(24).

¹⁹⁴ In addition, all response and remedial costs must be consistent with the National Oil and Hazardous Substances Contingency Plan (“NCP”) in order to recover costs under CERCLA. 40 C.F.R. § 300.1 (2006).

¹⁹⁵ *See generally* LAWRENCE P. SCHNAPF, *MANAGING ENVIRONMENTAL LIABILITY: BUSINESS TRANSACTIONS AND BROWNFIELD REDEVELOPMENT* § 5 (discussing and evaluating the cases relating the CERCLA’s liability provisions as they relate to different classes of PRPs).

¹⁹⁶ S. REP. NO. 96-848, at 31.

¹⁹⁷ Environmental Protection Law, art. 41.

bear legal liability in accordance with the provisions of relevant laws.”¹⁹⁸ Without more specificity and an aggressive liability scheme, the Chinese government will have difficulty implementing a polluter-pays principle for a soil remediation program.

V. COMPENSATION

For China, the second primary goal for a soil remediation program would be to provide compensation for personal and economic injuries suffered by the villagers in the Cancer Villages. Those affected by Dabaoshan’s mining operations have lost their farmland and livelihood while others have suffered medical problems from using contaminated water for drinking and irrigation. Without compensation provisions, a soil remediation program would only address the natural environment damage from soil pollution leaving villagers to pursue private remedies through litigation. This is main purpose of CERLCA but that was not what was originally intended by Congress.

A. *Victim Compensation in the Original Drafting of CERLCA*

Introduced on July 11, 1979, Senate Bill 1480 (S. 1480) that would eventually become known as CERCLA, provided victim compensation for lost wages and medical expenses.¹⁹⁹ Specifically, victims could be compensated for lost wages and medical expenses that were caused by the pollution.²⁰⁰ Lost wages could be compensated up to 100 percent for the first year following illness related to the pollution, and 80 percent for the second year.²⁰¹ Claims for out-of-pocket medical expense would be limited to those expenses incurred within six years of the

¹⁹⁸ *Id.* art. 44.

¹⁹⁹ Environmental Emergency Response Act, S. 1480, 96th Cong. (2d Sess. 1979).

²⁰⁰ *Id.* § 4(a)(2).

²⁰¹ *Id.* § 6(a)(3)(B).

discovery of the illness or injury.²⁰² An important aspect of the medical expense claim requirement was the introduction of the presumption of cause. Under S. 1480, if the claimant introduces evidence of exposure to a hazardous substance release that the defendant caused and a reasonable likelihood that the duration and quantity of the exposure was sufficient to cause or contribute to the illness, then the defendant is presumed to have caused that injury.²⁰³ Though this presumption affects only the burden of moving forward with claim,²⁰⁴ this provision coupled with the strict liability provisions for personal injuries would have removed some of the difficulties in winning compensation for medical expenses related to the pollution.

The victim compensation provision included in S. 1480 was intended to make up for the difficulties in pursuing toxic tort claims against the polluters. The Senate Report accompanying the S. 1480 emphasized that “traditional tort law presented substantial barriers to recovery” for personal injuries; “seeking compensation for pollution related injuries was usually cumbersome, time-consuming and expensive . . . few cases were filed and final judgments were rarely obtained; and as a result of these difficulties, “compensation ultimately provided to injured parties was generally inadequate.”²⁰⁵ The Senate Report aptly concluded that “[t]o establish provisions of liability any less than strict, joint, and several liability would be to condone a system in which innocent victims bear the actual burden of release, while those who conduct commerce in hazardous substances which cause such damage benefit with relative impunity.”

Unfortunately, the victim compensation provisions were eliminated from the bill along with a large reduction in the cleanup from \$4.1 billion to \$1.6 billion.²⁰⁶ The provisions were

²⁰² *Id.* § 6(a)(3)(A).

²⁰³ *Id.* § 4(c)(3)(A).

²⁰⁴ *Id.* § 4(c)(3)(B).

²⁰⁵ S. Rep. No. 96-848, at 13–14.

²⁰⁶ Frank R. Grad, *A Legislative History of the Comprehensive Environmental Response, Compensation and Liability (“Superfund”) Act of 1980*, 8 COLUM. J. ENVTL. L. 1, 19 (1982).

“hotly controversial” among chemical manufacturing companies and other companies.²⁰⁷

Without the compensation allowances under CERCLA, private parties had to resort to toxic tort litigation.

B. Compensation from Toxic Tort Litigation in the U.S. and China

1. Challenges to Toxic Tort Litigation in the United States

“A toxic tort is a case arising under the civil law process by which individuals, who have been exposed to a toxic substance or product which they believe has caused them injury which was not manifest until long after that exposure, seek redress for their injuries from those who are allegedly liable for causing their exposure.”²⁰⁸ Toxic tort cases and laws have been developing over the last fifty years and involve common tort actions such as negligence, nuisance, trespass and strict liability.²⁰⁹

The most significant challenge of toxic tort cases is proving causation and exposure requirements. Because of long latency periods between exposure and the manifestation of injury, the plaintiff is required to link polluting event to their injuries over long periods of time.²¹⁰ To make matters more difficult, the lack of monitoring and health tracking results in the lack of data useful in proving causation.²¹¹ In addition, the courts impose a high bar for admissibility of expert testimony on causation, requiring an expert to develop her opinion based only on a court-approved methodology.²¹²

²⁰⁷ Phillip T. Cummings, *The Last of the Major Environmental Laws, CERCLA Became the Last Link in Pollution Control*, ENVTL. FORUM, Nov.–Dec. 1990, at 10, 13.

²⁰⁸ Anthony Z. Roisman, Martha L. Judy & Daniel Stein, *Preserving Justice: Defending Toxic Tort Litigation*, 51 FORDHAM ENVTL. LAW J. 191, 195 (2004).

²⁰⁹ *Id.* at 196 (2004).

²¹⁰ CARL F. CRANOR, TOXIC TORTS: SCIENCE, LAW, AND THE POSSIBILITY OF JUSTICE 14 (2006).

²¹¹ Roisman et al., *supra* note 208, at 203.

²¹² See *Daubert v. Merrell Dow*, 509 U.S. 579 (1993) (“In a case involving scientific evidence, evidentiary reliability will be based upon scientific validity,” where judges act as “gatekeepers” to expert testimony).

As a result of these causation requirements, the cost of toxic tort claims is too high for many victims as the cost of pursuing and proving their claim is likely to exceed the potential recovery. Many potential toxic exposure personal injury cases are turned into class action cases where all plaintiffs are lumped together causing a dilution of claims.²¹³ Unfortunately, these challenges under U.S. toxic tort litigation exist in greater degrees in China.

2. Challenges to Toxic Tort Litigation in the China

In the rural areas of China, villagers and rural residents rarely bring a suit against a polluter to receive compensation for their injuries. Rural villagers in areas like the Cancer Villages will bring a civil suit when their rights are badly infringed, when they cannot settle the dispute through negotiation with the infringing party, or when they cannot receive assistance from the government. Generally, the villager leader or an informal villager organizer will gain the villagers' trust in the rural places and initiate a lawsuit against a local polluter, or committee of the villagers would initiate the litigation. In many instances, those initiating the lawsuit will lack money, time, or knowledge to bring a suit themselves and require the villagers' assistance.

But private lawsuits have been increasing in recent years.²¹⁴ The Cancer Villages, villagers in Tangxin and Liangqiao have or are planning to file lawsuits because the national or local government agencies have failed to adequately address and compensate for the actions of local polluter. Nongovernmental organizations, like the Center for Legal Assistance for Pollution Victims ("CLAPV") headed by well-respected Prof. Wang Canfa, has achieved

²¹³ Roisman et al., *supra* note 208, at 206–07 (2004).

²¹⁴ See Tim Johnson, *Lawsuits Sprout in China as Interest in Legal Affairs Blooms*, Knight Ridder/Tribune News Service, Nov. 12, 2003 ("The proliferation of lawsuits attests to the country's success in raising citizens' awareness of legal rights and in making the judiciary more professional.")

considerable success in winning compensation suits against polluters.²¹⁵ Unfortunately, CLAPV is only one of a small group of nongovernmental legal organizations that can help villagers. In many situations, an individual group of villagers like those in Liangqiao and Tangxin face many hurdles in bringing a successful lawsuit against a polluter. Villagers who have filed suit against Dabaoshan face the same toxic tort litigation challenges as those in the United States but at greater extremes. Access to medical services is extremely difficult and rural doctors rarely keep any or accurate records.²¹⁶ But the most intractable issue related to toxic tort litigation is China's judicial system.

China's judicial structure, lack of judicial independence, and procedural obstacles²¹⁷ are the some of the main procedural barriers that villagers face in initiating a lawsuit. Although the Chinese constitution and laws require the courts to "exercise judicial power independently,"²¹⁸ China's judicial system has inherent characteristics that prevent judges and courts from being independent. Unlike the United States, China does not have separation of powers and the "judiciary is not regarded as an independent third branch."²¹⁹ Judges are highly dependent on local government who are responsible for their appointments and salaries.²²⁰ Often, a local government body will interfere when a court handles a case that affects its interests.²²¹ Judges may not fairly handle a case because they will obey the "instructions" and pressure from

²¹⁵ The CLAPV trains lawyers on environmental law issues, provides a telephone hotline to pollution victims, and litigates environmental law cases. ELIZABETH C. ECONOMY, *THE RIVER RUNS BLACK* 115 (2004).

See CLAPV's website at <http://www.clapv.org/new/en/> for a summary of successful cases tried by CLAPV.

²¹⁶ Interview with Baofen He, Branch Secretary of Liangqiao Village, in Wengyuan County, Shaoguan City, Guangdong Province, China (Dec. 19, 2006).

²¹⁷ Rural villagers also face substantive challenges related to initiating a private law suit against a polluter. Many times villagers are unable to demonstrate legal causation or have difficulties in calculating the appropriate amount of compensation to request from the court.

²¹⁸ CHINA CONSTITUTION, art. 126; Organic Law of the People's Courts, art. 4.

²¹⁹ Sam Hanson, *Improving Access to Justice: The Chinese Century: An American Judge's Observations of the Chinese Legal System*, 28 WM. MITCHELL L. REV. 243, 249 (2001).

²²⁰ ZOU KEYUAN, *CHINA'S LEGAL REFORM: TOWARD THE RULE OF LAW* 151 (2006).

²²¹ *Id.*

Communist Party leaders and local government bodies.²²² Critics of China's judicial system claim that judicial corruption is the "most serious of all corrupt cases in China."²²³

For the villagers, one of the hardest obstacles to overcome is the costs associated with retaining a lawyer and filing a complaint with the court. Organizations like CLAPV rely on private funding and therefore are limited in the number of cases that it can handle each year.²²⁴ China has growing but limited supply of private environmental lawyers with sufficient expertise in environmental law.²²⁵ The lawyer's fee may too expensive for rural villagers since his fee is based on the compensation amount and out-of-pocket expenses such as repeated travel costs to the rural areas.²²⁶ In addition, court fees can be a significant barrier for villagers seeking a litigation remedy to redress extensive personal injuries because the higher the amount of compensation sought, the higher the court fee.²²⁷ Even though the court may waive the court fees under certain circumstances,²²⁸ lawyers seldom request the waiver out of fear that such a request will bias the judge against their client.²²⁹

C. An Alternative to Toxic Tort Litigation: Medical Monitoring

With the numerous problems with toxic tort litigation in China, an alternative to seeking full compensation for personal injuries would be to compensate villagers in the Cancer Villages for medical monitoring. Whether paid from the China Superfund or as part of settlement

²²² *Id.*

²²³ *Id.* at 161.

²²⁴ ECONOMY, *supra* note 35, at 115.

²²⁵ Ferris & Zhang, *supra* note 97, at 598.

²²⁶ Randall Peerenboom, *Seek Truth From Facts: 1 An Empirical Study of Enforcement of Arbitral Awards in the PRC*, 49 AM. J. COMP. L. 249, 270 (2001).

²²⁷ Adam Briggs, Note, *China's Pollution Victims: Still Seeking a Dependable Remedy*, 18 GEO. INT'L ENVTL. L. REV. 305, 327 (2006).

²²⁸ Civil Procedure Law, art. 107.

²²⁹ Briggs, *supra* note 225, at 327. The standard court fees to initiate civil litigation are based on compensation requests: below 1,000 yuan: 50 yuan fee; 1,000 – 50,000 yuan: 4 percent of the dispute amount + 10 yuan fee; 50,000 – 100,000 yuan: 3 percent of the dispute amount + 510 yuan fee; 100,000 – 200,000 yuan: 2 percent of the dispute amount + 1510 yuan fee; 200,000 – 500,000 yuan: 1.5 percent of the dispute amount + 2,510 yuan fee; 500,000 – 1,000,000 yuan : 1 percent of the dispute amount + 5,010 yuan fee; above 1,000,000 yuan : 0.5 percent of the dispute amount + 10,010 yuan fee. Fee Scale for Court Acceptance Fee of People's Court, P.R.C., art. 4.

agreements with between the polluting entity and the local EPBs, the villagers will be able to address their health issues on an on-going basis and begin to produce document any evidence of their medical injuries caused by the soil pollution.

CERCLA does not expressly provide for recovery of medical monitoring as part of the recovery costs.²³⁰ Some courts have broadly interpreted CERCLA to include medical monitoring as a necessary action to “monitor, access, and evaluate the releases of hazardous substances in the environment . . . as may be necessary to prevent, minimize, or mitigate damage to the public health or welfare.”²³¹ The Brownfields Act specifically allows for local governments to use up to 10 percent of their grant to monitor health of the local population that has been exposed to the hazardous substances from the brownfield site.²³²

Although medical monitoring may only represent the smallest fraction of the personal injuries suffered by villagers in the Cancer Villages, this incremental step forward in proving causation and immediate medical attention may bring some measure of justice over no justice at all.

VI. ENFORCEMENT

In any environmental protection framework, the laws and regulations are only as effective as the enforcement of those laws. Even if China were to implement a soil remediation and compensation program, its major challenge will be to enforce the new regulatory regime.

The United States and China have different administrative enforcement structures.

²³⁰ See *Daigle v. Shell Oil Co.*, 972 F.2d 1527, 1537 (10th Cir. 1992) (holding that establishment of fund to finance long-term medical monitoring of those who had been exposed to the hazardous substance release was not considered a “remedial,” “removal,” or “response” under CERCLA’s definition).

²³¹ 42 U.S.C. § 9601(23) (2006). See Carmen E. Sessions, *Medical Monitoring Awards under CERCLA: Statutory Interpretation Versus Fundamental Fairness*, 8 S.C. ENVTL. L. J 81, 92–96 (1999) for cases that have allowed medical monitoring as damages in toxic tort cases.

²³² 42 U.S.C. § 9604(k)(4)(C) (2006).

A. Enforcement of Environmental Laws in China

Although China has numerous national environmental statutes, regulations, and international treaties, China's environmental legal framework suffers from a lack of implementation and ineffectiveness. A SEPA official has said that China has a "wealth of laws with shallow roots."²³³ The environmental regulations and statutes are viewed as "ambiguous, generalized, or inconsistent with the provisions set forth in other laws."²³⁴ General laws make it difficult for the regulated entities to determine their compliance requirements and even more difficult for environmental officials to enforce and monitor the laws and regulations.²³⁵ In terms of implementation, national statutes lack "local legitimacy" and local agencies such as the EPBs simply do not enforce implement or enforce environmental laws.²³⁶

At the heart, EPBs cannot and do not adequately enforce environmental laws. The local government's priority is to promote economic development, commonly referred to as "local protectionism."²³⁷ Some local governments would rather or are required to consider national and local economic development and employment as their primary goal over environmental protection.²³⁸ Though the EPB may be aware of a pollution problem, they have incentive to not address it or may even shield the polluter from liability.

The lack of funding affects enforcement because of inadequate staff and materials for regular inspections.²³⁹ But even when the EPBs do monitor and inspect factories and enterprises, they have been ineffective in enforcing environmental laws. Most often, the EPBs will notify

²³³ Ferris & Zhang, *supra* note 97, at 589.

²³⁴ Ferris & Zhang, *supra* note 101, at 440.

²³⁵ *Id.* at 440–41.

²³⁶ Benjamin van Rooij, *Implementation of Chinese Environmental Law: Regular Enforcement and Political Campaigns*, in *CHINA'S LIMITS TO GROWTH: GREENING STATE AND SOCIETY* 59 (Peter Ho & Eduard B. Vermeer, eds., 2006).

²³⁷ *Id.*

²³⁸ *A Great Wall of Waste – China's Environment*, *supra* note 39.

²³⁹ Rooij, *supra* note 236, at 62.

factories prior to inspections allowing the factories to change their operations to report lower emissions.²⁴⁰ EPB officials have acknowledged that factories continue to pollute over environmental standards at night and on the weekends when there are no inspections.²⁴¹

EPBs and local governments are heavily dependent on state-owned enterprises (“SOE”) like Dabaoshan because they primarily funded through taxes, ad hoc fees, and other unauthorized requests for funds.²⁴² With an SOE like Dabaoshan that is a profitable source of revenue and employment opportunities, EPBs have little incentive to shut down Dabaoshan Profitable enterprises like Dabaoshan, which produces 850,000 tons of iron ore annually and earned \$10 million in profit in 2004,²⁴³ pay both product and income taxes to the local governments.²⁴⁴ In an effort to reestablish a stronger and more effective enforcement program, China may have to provide the SEPA with more resources and authority to intervene in local matters.

B. Enforcement of Environmental Laws in the United States

In the United States, the EPA was established in 1970 by President Richard Nixon to administer new environmental laws and regulations.²⁴⁵ Headquarters in Washington D.C. with 10 regional offices, EPA is an independent agency housed in the executive branch responsible for conducting research, monitoring, setting standards, and enforcing environmental laws.²⁴⁶ EPA has grown significantly since 1970 with 4,084 staff with a budget of \$1,003,984,000 to 2004 with 17,850 staff with a budget of \$7,626,537,000.²⁴⁷ The Office of Site Remediation

²⁴⁰ ECONOMY, *supra* note 35, at 110.

²⁴¹ *Id.*

²⁴² MA & ORTOLANO, *supra* note 144, at 50.

²⁴³ Simons, *supra* note 56.

²⁴⁴ MA & ORTOLANO, *supra* note 144, at 142.

²⁴⁵ ROBERT W. COLLIN, THE ENVIRONMENTAL PROTECTION AGENCY: CLEANING UP AMERICA’S ACT 1 (2006).

²⁴⁶ *Id.* at 2.

²⁴⁷ *Id.*

Enforcement facilitates, coordinates, and evaluates the enforcement of EPA's national hazardous waste cleanup programs, including CERCLA.²⁴⁸

EPA and states work together to protect the environment and implement environmental statutes. A part of EPA revenues are allocated to state agencies and local communities.²⁴⁹ States develop performance partnership agreement with EPA to share roles and responsibilities, agree on goals and priorities, devise strategies to achieve these goals, and decide how to measure progress.²⁵⁰ In addition, EPA can delegate permitting authority to states, while still retaining some oversight control over the permitting process.²⁵¹

In comparison, the SEPA lacks financial and human resources to adequately protect the environment. The SEPA cannot effectively implement and enforce national legislation and regulations because it does not directly employ regional and local employees in the EPBs.²⁵² The SEPA is staffed with about 300 employees at the national office to enforce environmental regulations against over 20,000 factories.²⁵³ In addition, the SEPA must also compete for resources and influence with other government agencies.²⁵⁴ These "bureaucratic rivalries" results in lack of inter-agency cooperation and limited sharing of relevant data collected with scarce financial and personnel resources.²⁵⁵

Unlike EPA, the SEPA also lacks direct control over the local EPBs and plays a "minor role" in the implementation of environmental law in China.²⁵⁶ Even though EPBs are part of the local governments and units of the SEPA administrative hierarchy, EPBs only have a formal

²⁴⁸ *Id.* at 193.

²⁴⁹ *Id.* at 199.

²⁵⁰ *Id.*

²⁵¹ *Id.* at 202.

²⁵² *A Great Wall of Waste – China's Environment*, *supra* note 39.

²⁵³ *Id.*

²⁵⁴ *Id.*

²⁵⁵ *Id.*

²⁵⁶ MA & ORTOLANO, *supra* note 144, at 153.

reporting relationship with the environmental agency one level above it.²⁵⁷ Using the Cancer Villages as an example, since villages like Shangba, Liangqiao, and Tangxin are within the Wengyuan County, the EPB of Wengyuan is accountable to the Wengyuan County people's government and the EPB of Shaoguan City's EPB only. A more integrated enforcement structure similar to EPA is a difficult if not impossible task because of resource, politics, population, and geographic area of China in comparison to the United States.

VI. WOULD A CERCLA-TYPE PROGRAM HELP THE CANCER VILLAGES?

In many respects, CERCLA offers a regulatory structure that would help China achieve a successful soil remediation program. The trust fund provision of CERCLA would enable China to finance remediation of contaminated soil through expansion or amendment of the Special Fund. The strict liability provision would hold polluters responsible for contamination and promotes the polluter-pays principle that has been emphasized in China's regulatory programs and laws like the pollution discharge fee system. To consider whether CERCLA would work in China, the question that should be asked is: Has CERCLA worked in the United States? Many critics would say that CERCLA program is faced with more challenges than successes.

Since the inception of CERCLA, EPA has developed a strong regulatory program with significant results in cleaning up contaminated sites. Since 1980, EPA's CERCLA enforcement program has secured PRP monetary contributions of almost \$24 billion for cleanup of contaminated sites.²⁵⁸ Ninety-five percent of all contaminated sites listed on the NPL have

²⁵⁷ *Id.*

²⁵⁸ U.S. ENVTL. PROT. AGENCY, SUPERFUND'S 25TH ANNIVERSARY: CAPTURING THE PAST, CHARTING THE FUTURE (2006), <http://www.epa.gov/superfund/25anniversary> (last visited March 26, 2007).

completed construction or have begun construction.²⁵⁹ PRPs have performed over 70 percent of new cleanups at NPL sites since 1992.²⁶⁰ In addition, the Brownfields Act, in a short time since its enactment in 2002, has achieved measurable success. Within a year of the law's passage, EPA awarded more than \$75 million in funding to revitalize brownfields.²⁶¹

Though CERCLA through its funding and broad liability scheme has made significant strides in cleaning up contaminated sites, the CERCLA statutory scheme has been criticized for its funding issues, delays in cleanup activities, and administrative expenses. Currently, 100 percent of Superfund appropriations come from general revenue because the Superfund trust is empty.²⁶² Because the CERCLA program relies on EPA to sue PRPs to recover the costs of the clean up, litigation has channeled too much CERCLA money into transactional costs and too little money into cleanup costs. CERCLA has endured frequent and fervent criticism as a generator of high transaction costs, including the costs of investigation, negotiation, and litigation.²⁶³

After sites have been identified by the EPA, the clean up process is slow and ineffective. At most complex sites it takes decades to complete the remediation process. For example, mining "megsites"²⁶⁴ where there are multiple contaminants deposited miles from the source,

²⁵⁹ U.S. ENVTL. PROT. AGENCY, PROTECTING HUMAN HEALTH AND THE ENVIRONMENT: SUPERFUND MARKS THE 1000TH CONSTRUCTION COMPLETION (2006), <http://www.epa.gov/superfund/news/1000cc.htm> (last visited March 26, 2007).

²⁶⁰ U.S. ENVTL. PROT. AGENCY, SUPERFUND 20TH ANNIVERSARY REPORT: FULFILLING THE PROMISE OF EARTH DAY, 5-1 (2000), www.epa.gov/superfund/action/20years/ch5pg1.htm (last visited March 26, 2007).

²⁶¹ U.S. ENVTL. PROT. AGENCY, INVESTING IN PARTNERSHIP, POSSIBILITY, AND PEOPLE: A REPORT TO STAKEHOLDERS FROM THE U.S. EPA BROWNFIELDS PROGRAM 6 (2005), *available at* http://www.epa.gov/swerosps/bf/news/05stakeholder/StakeholderReport_FulfillingTheMandate.pdf.

²⁶² Katherine N. Probst, *Superfund at 25: What Remains to be Done*, Resources, Fall 2005, at 21, *available at* <http://www.rff.org/rff/Documents/RFF-Resources-159-Superfund.pdf>.

²⁶³ David M. Driesen & Shubha Ghosh, *The Functions of Transaction Costs: Rethinking Transaction Cost Minimization in a World of Friction*, 47 ARIZ. L. REV. 61, 77-78 (2005). While it is difficult to determine the extent of CERCLA transaction costs over the past three decades, critics agree that these costs are very high. *Id.*

²⁶⁴ A Superfund site is considered a "megsite" if the remedial actions costs exceeds \$50 million. NAT'L ADVISORY COUNCIL FOR ENVTL. POLICY AND TECH., SUPERFUND SUBCOMMITTEE FINAL REPORT 1 (2004). The average cost of

large quantities volumes of waste material accumulated, and soil, groundwater, surface water and sediment contamination, illustrate the weaknesses of the CERCLA program.

In situation similar to Dabaoshan and the Cancer Villages, the Coeur d' Alene River Basin is one of the largest mining-related Superfund sites, contaminated with high levels of heavy metals from the Bunker Hill Mining and Metallurgical Complex mining operations.²⁶⁵ The contamination extended 166 miles across Idaho through the Lake Coeur d' Alene and the Spokane River into Washington State.²⁶⁶ By the time EPA listed the Coeur d' Alene River Basin Superfund site on the NPL in 1983, residents, especially children, had high levels of lead in their blood.²⁶⁷ Almost twenty years later in 2002, EPA issued a record of decision addressing the entire contaminated river basin area and estimated that an interim remedy would cost \$359 million over period of thirty years to protect the environment and human health.²⁶⁸ Problems identified in this Superfund mining megasite included: (1) no final remedy because of the vast quantity of contamination—over 100 million cubic yards of contaminated material; (2) a long term process that could take over 100 years to achieve water-quality standards with an uncertain outcome; (3) funding limitations because there was no financially viable PRP; (4) criteria required to select remedy prevented more realistic short-term remedies from being selected; and (5) the bureaucratic process of studying the site is time-consuming and costly.²⁶⁹ The question that is unanswered is whether the cost of the benefits of the interim remedy is worth the high and

a megasite is \$140 million as compared to than average cost of \$12 million for a non-megasite. *Id.*, at attachment A 66.

²⁶⁵ NAT'L ACAD. OF SCIENCES, SUPERFUND AND MINING MEGASITES: LESSONS FROM THE COEUR D' ALENE RIVER BASIN 1, 412 (2005) [hereinafter SUPERFUND AND MINING MEGASITES].

²⁶⁶ *Id.* at 15.

²⁶⁷ *Id.* at 1.

²⁶⁸ *Id.* at 2 .

²⁶⁹ *See id.* at 413–21 (2005) (discussing the challenges and issues related to selecting a remedy for the Coeur d' Alene River Basin Superfund site).

time-consuming cost of achieving benefits that are uncertain. Should CERLA be used to address mega mining sites like the Coeur d'Alene River Basin?

These issues should not diminish the success of the CERLA in cleaning up smaller scale but extensive Superfund sites contaminated by mining operations. Many mining Superfund sites including aspects of the Coeur d'Alene River Basin Superfund site have used the CERCLA provisions to achieve greater flexibility in developing remedies. In the Coeur d'Alene, EPA had the flexibility to: establish a commission to manage the remediation; to include other agencies like the U.S. Geological Service, Fish and Wildlife Service, and the Bureau of Land Management in implementing the clean up; and to develop a more extensive environmental monitoring plan to address the complexities and uncertainties of the megasite.²⁷⁰ The flexibility CERCLA combined with viable PRPs willing and able to accept responsibility for remediation has lead to success in cleaning up mining Superfund sites.²⁷¹

Currently, it is difficult to assess whether China is ready or willing to develop a CERLCA-type program to address areas like the Cancer Villages. There many questions that still need to explored and answered.

CONCLUSION

China faces an enormous task as it moves forward in addressing its soil pollution crisis. The Coeur d'Alene Superfund site highlights a fraction of the challenges the government and the Cancer Villages would face in trying to remediate the contaminated land. And any remediation plan under a CERCLA-type program would not even address the personal injuries suffered by the villagers.

²⁷⁰ *Id.* at 423–24.

²⁷¹ *See id.* at 422–23 (describing the East Tennessee Copper Basin Superfund site, one of the largest contaminated sites in the Eastern United States, as successful cleanup effort involving the state, EPA, and private PRPs performing the remediation under a consent decree).

With any complex and ambitious regulatory scheme that requires extensive financial and human resources, it is not surprising to have implementation difficulties and funding problems. Critics have argued that CERLCA has not done enough. But the important point is that United States took a bold leap forward in addressing the urgent problems with hazardous waste sites. At the time Congress was drafting CERLCA, the United States was experiencing a similar environmental crisis as China is today with contaminated land and rivers. In the late 1970s, “serious hazardous waste problems were falling through the cracks of environmental laws” like the Resource and Recovery Act that primarily regulated the transport and disposal of future hazardous waste.²⁷²

In 1978, President Carter declared a State of Emergency at Love Canal, a site in New York where 21,000 tons of chemical waste were deposited.²⁷³ More than 80 chemicals were found in the residential homes, many known carcinogens, and 1,000 families were relocated and homes along the canal were destroyed.²⁷⁴ Though the company acknowledged that they buried the chemical on the site, they escaped liability. Incidents like Love Canal brought issues of contaminated sites and hazardous waste management into the national media. In many respects, CERCLA was the “natural adaptation” and extension of existing common law principles and other environmental statutes like the Clean Water Act.²⁷⁵

China appears to be poised on the same precipice as the United States was in the late 1970s. With the soil pollution crisis entering the world media spotlight, places like the Cancer Villages may become the Love Canal of China, pushing the government to act. And like the United States in the 1970s, China has a wealth of environmental laws like the current pollution

²⁷² U.S. ENVTL. PROT. AGENCY, FY 2004 SUPERFUND ANNUAL REPORT 1 (2004).

²⁷³ *Id.*

²⁷⁴ PERCIVAL ET AL., *supra* note 137, at 224.

²⁷⁵ *Id.*

discharge fee system, the Special Fund, and other environmental statute to adapt, strengthen, and extend to the area of soil pollution. China's largest challenge is not drafting a new soil remediation statute but enforce existing laws to hold polluters responsible.

Though China lacks the experience with implementation and enforcement that the United States has gained, China does have the benefit of "picking and choosing" the best from environmental programs like CERCLA and other programs in the world. From this vantage point, China can determine what aspects would best complement China's legal and regulatory framework for environmental protection. Without a doubt, any initiative to tackle the soil pollution crisis will require a massive nationwide effort from the government, the Communist Central Party, and its citizens. It may be the right time for China to take another great leap forward to protect their homeland and make the Cancer Villages like Love Canal a thing of the past.