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ARTICLE

REVIEW OF REGULATORY FRAMEWORKS FOR CONTAMINATED LAND IN CHINA

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China is suffering severe soil contamination, but no specific national legislation has been adopted to address this issue. Under the current regulatory framework, there are numerous relevant provisions on contaminated land management. It is recommended that a specific legislation should be promulgated at the national level to improve the current situation. Foreign experiences should be considered in China's specific social environmental context. A proper liability mechanism should be established for a better judicial treatment to contaminated land issues. While a proper contaminated land liability mechanism is being developed, the principles of state liability and retroactive liability, and the principle that polluters pay should be followed. Public participation should be encouraged in contaminated land management.

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INTRODUCTION

Contaminated land is a site where toxic chemicals potentially harmful to environment and ultimately to human beings are in higher concentration than are found normally in the area. Contamination can occur as a result of industrial, agricultural or commercial activities.[1] It may also occur following

[1] Huaiman Chen, 环境土壤学 (Environmental Edaphology), Science Press (Beijing), at 8 (2005).

waste disposal, spills or movement of contaminants from adjacent properties. Chemicals that can be found at a contaminated site include metals and metalloids (such as lead, cadmium, mercury or arsenic from mining tailings or landfill sites), oil, tar, harmful gases, solvents, pesticides or other hazardous wastes. Human beings may be exposed to contaminants from a contaminated site via various routes. The actual degree of risks to a hazardous chemical often requires a site-specific risk assessment.[2]

Land contamination in China has been a neglected environmental problem throughout the country's industrialization process. China's economy has grown rapidly since 1978, when reforms of opening-up the economy were first introduced. Rapid growth resulted in significant industrialization and urbanization and pollution. Large quantities of waste gas, waste water, and waste solid were discharged into the environment resulting in serious environmental pollution problems and deterioration of ecosystems. Unfortunately, soil contamination, which significantly affected people's health and China's sustainable development, was largely ignored by both the government and people in the past few decades. Statistics show that at the end of 2006, about 1 million km^2 of cultivated land nationwide was contaminated; 216,667 km^2 of the cultivated land was polluted by waste water irrigation and occupied; and 13,333 km^2 was damaged by solid waste, totaling up to more than one tenth of the total area of the cultivated land. A majority of the polluted cultivated land is located in the economically developed areas. It is estimated that grain polluted by heavy metals in China comprises as much as 12 million tons each year, with a direct economic loss of over RMB 20 billion (approximate USD 3.16 billion).[3]

Causes of soil contamination in China are complex and there is no general agreement on the causes. But one consensus reached among Chinese scientists is that human activities have led to heavy metal pollution, pesticide pollution and oil pollution, etc., and consequently destroyed the soil's

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[2] M. H. Wong and A. D. Bradshaw, *The Restoration and Management of Derelict Land: Modern Approaches*, World Scientific Publication (River Edge), at 19 (2002).

[3] Shengxian Zhou, 周生贤局长在全国土壤污染状况调查视频会议上强调：采取有效措施保障土壤环境安全和人体健康 (Director Zhou's Speech at the National Video Conference on Soil Contamination Survey), 22(4) 生态与农村环境学报 (Journal of Ecology and Rural Environment) I, I–II (2006).

ecosystem (such as causing soil acidification and loss of soil nourishment).[4] The National Soil Pollution Survey launched in 2007 is still uncompleted and the national statistics on soil contamination have not been published.[5] Although no official national statistics on land pollution are currently available, we may roughly ascertain the extent of the problems with the assistance of enormous background studies, surveys, central and local government reports, and mass media reports published in the last few years.

Up to now, there is no national specific legislation on addressing this issue. However, numerous relevant provisions on soil or land protection can be found under the current legal system in China, particularly in the context of environmental regulatory system. Those provisions address broad issues such as soil quality protection, land reclamation, land use planning and relevant liabilities.

Section I of this paper sets out the institutional framework of environmental legislation in China. Section II introduces the regulatory framework for addressing contaminated land issues, and discusses the environmental legislation frameworks for addressing contaminated land problems, under which several pieces of key legislation will be analyzed. Section III reviews some typical existing mechanisms, e.g. the soil contamination monitoring system, site assessment and reporting system, the treatment and remediation mechanism, and liability mechanism under the current environmental law system. Section V discusses the problems of current regulatory framework of contaminated land management in China. Finally, it concludes that specific legislation at the national level for regulating contaminated land issue should be established, in this process the experiences from the US and the UK may be referred.

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[4] Yi Li, 土壤污染制约农业可持续发展 (Soil Contamination Restrains Agricultural Sustainable Development), 科学时报 (Science Times), Jul. 20, 2006.

[5] The National Soil Pollution Survey was launched in 2007 by the State Environmental Protection Administration (SEPA) and the Ministry of Land and Resources; it will take three years to complete, at a cost of RMB 1 billion (USD 125 million). The survey will cover mainland China only, excluding Taiwan, Hong Kong and Macao Special Administrative Regions. See Shen Li, National Soil Pollution Survey Planned, at http://www.china.org.cn /english/China/175191.htm (last visited Sept. 1, 2012). For more details of the survey, see Xiaoqing Wu, 吴晓青副局长部署全国土壤污染状况调查工作 (Vice Director Wu Arranged Tasks for the National Soil Contamination Survey), 22(3) 生态与农村环境学报 (Journal of Ecology and Rural Environment) III, III (2006).

I. INSTITUTIONAL FRAMEWORK OF ENVIRONMENTAL LEGISLATION IN CHINA

The People's Republic of China (PRC) is a unitary and multinational state and is notable for its highly centralized political system. China's governmental administration system is based on a multi-level institutional structure. Currently, China is administratively divided into 23 provinces,[6] 5 autonomous regions,[7] 4 municipalities[8] and 2 special administrative regions (SARs),[9] which are under the direct leadership of the central government. The highest level government is the central government. The sub-level is at the provincial level, then the prefecture/municipality/district level, followed by the county level, and finally the township and village levels.[10]

After more than 40 years of development, a comprehensive policy framework for environmental protection (incl. natural resources protection and pollution control) has been established in China. Today, more than 1600 regulations and administrative guidelines have been proclaimed by provincial people's congresses and governments in China. The People's Congress is responsible for formulating laws and regulations. The National People's Congress (NPC) is the highest legislative body in China and is responsible for formulating national environmental laws. Provincial People's Congresses

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[6] The 23 provinces are Heilongjiang, Jilin, Liaoning, Qinghai, Gansu, Shaanxi, Shanxi, Hebei, Sichuan, Hubei, Henan, Shandong, Anhui, Jiangsu, Yunnan, Guizhou, Hunan, Jiangxi, Zhejiang, Hainan, Guangdong, Fujian and Taiwan.

[7] Autonomous regions is a minority subject which has a higher population of a particular minority ethnic group along with its own local government, but an autonomous region theoretically has more legislative rights than in actual practice. There are five autonomous regions in China: the Tibet Autonomous Region, the Guangxi Zhuang Autonomous Region, the Ningxia Hui Autonomous Region, the Inner Mongolia Autonomous Region, and the Xinjiang Uygur Autonomous Region.

[8] Municipalities are higher level cities which are directly under the Chinese central government, with a status equal to that of provinces. The four municipalities in China are Beijing, Tianjin, Shanghai and Chongqing.

[9] Special Administrative Regions (SARs) are highly autonomous and self-governing sub-national subjects of the People's Republic of China. Each SAR has a provincial level chief executive as the head of the region and the head of the government. The regional government is not fully independent, as foreign policy and military defense are the responsibility of the central government, according to the Constitution.

[10] Abigail R. Jahiel, *The Organization of Environmental Protection in China*, (156) China Q. 757, 758 (1998).

formulate bylaws on the basis of the laws formulated by the NPC. The hierarchy of Chinese law states that the Constitution is the top authority, followed by four levels, which include:

(1) Laws. These general laws include civil laws, criminal laws, administrative laws, etc. The NPC passes these laws and revisions of them. Laws which have a strong impact on society must be passed by the NPC, which is convened every March or April. Less influential laws can be reviewed and passed by the Standing Committee of the NPC, which meets every two months.

(2) Administrative regulations. Administrative regulations are at the State Council level or the provincial level. These regulations have an operational status and are used to explain how to implement the laws. However, the State Council regulations are valid nationwide, whereas provincial regulations are valid only in relevant provinces. Laws and regulations have a judicial status in China, and must be enforced.

(3) Administrative rules. The State Council and all its ministries can issue management directions at the national level. Generally these regulations deal with new, emerging issues to be converted into laws at a later stage, e.g. the management of heavy metal pollution control and the management of contaminated sites.

(4) Administrative documents. To facilitate their routine work, administrative institutions issue certain documents, often called "announcements." These announcements may be instructions for registration, inspection, monitoring, etc. Most administrative documents are formulated at provincial or lower levels.

In China, environmental management and pollution control is a responsibility of a large number of agencies and different level governments. At the national level, the current designated lead agency is the Ministry of Environmental Protection (MEP). Before 2008, it was the State Environmental Protection Agency (SEPA).[11] On 15 March 2008, the first

[11] SEPA was initiatively created as the State Council Environmental Protection Leading Group which was set up in 1974, following the First World Conference on Environment held in Stockholm in 1972. In 1982, an EPB was established within the newly created Ministry of Urban and Rural Construction and Environmental Protection. Till 1988, this EPB was promoted to become the National Environmental Protection Agency under the direct control of the State Council. In the 1998 restructuring, the National Environmental Protection Agency was renamed as SEPA and elevated to the status of a ministry although it is not represented on the State Council.

meeting of the 11th NPC decided to establish the MEP with the aim of strengthening environmental policy-making and planning, and coordinating efforts to deal with major environmental problems. The main functions of MEP include: (i) drafting and implementing environmental protection plans, policies and standards; (ii) coordinating efforts to prepare environmental function zoning; (iii) monitoring and managing environmental pollution; and (iv) solving major environmental problems.

The establishment of MEP is a milestone in China's environmental protection efforts. It should be noted that the power of the MEP has been substantially enlarged since its elevation. For example, the State Council issued the Regulations on Functions, Structures and Staffing of the Ministry of Environmental Protection on 11 July 2008, under which the MEP can cancel and empower administrative approvals, reduce technical and administrative tasks, straighten out division of work among departments and reinforcing such functions as coordination, macro control, supervision and law enforcement as well as public service.

In addition to the MEP, the central government ministries, such as the Ministries of Agriculture, Energy, Forestry and Water Resources, also have the power to issue environmental regulations at a national level. Local people's congresses and their respective standing committees are authorized to adopt local regulations but only if those regulations accord with state and national legislation and regulations. Similarly, local administrative rules, which implement national laws and regulations as well as local regulations, are issued by local governments. For example, the State Forestry Administration is responsible for forest protection, reforestation, and wildlife management. In addition, the Ministry of Wate Resources is obligated to the control of soil erosion and groundwater quality, and carried watershed management outside urban areas.

The Environmental Protection Bureau (EPB) represents the decentralized power structure from the provincial level to the levels of cities, counties and townships. They are funded by the local governments of which they are a part and are responsible for environmental protection under their jurisdiction, including drafting local laws, issuing administrative regulations, supervising and organizing on environmental monitoring and control, and for the education and training in environmental issues. EPBs constitute the basic units for compliance

with environmental laws and regulations, and are assisted by research institutes and monitoring centers.

II. REGULATORY FRAMEWORK FOR ADDRESSING CONTAMINATED LAND ISSUES

China pays great attention to environmental legislative work. Today, the Chinese government has established a relatively advanced environmental law system to address environmental protection issues. The regulatory framework of China comprises: (i) the Constitution; (ii) the Environmental Protection Law (1989); (iii) other national laws and regulations; (iv) decrees issued by the MEP (former SEPA); (v) local legislations; and (iv) environmental protection standards.

Under this framework, air pollution, water pollution, solid waste pollution and noise pollution have been addressed by the Constitution and environmental laws. Particularly, some of the relevant legislations have been amended several times to take into account dynamic social economic circumstances. Land contamination, however, didn't draw much attention from the public over the last few decades.[12] Although there is no specific law dealing with soil contamination in China,[13] the existing laws and regulations may be applied to soil contamination issues. For example, Environmental Protection Law of the People's Republic of China (1989),[14] Law of the People's Republic of China on Prevention and Control of Environmental Pollution by Solid Waste,[15] Agriculture Law of the People's Republic of China,[16] Land Administration Law of the People's Republic of China (2004

[12] Xiaomiao Qi, 中国污染土壤修复标准仍是空白——访南开大学环境科学与工程学院院长周启星 (The Vacant Standard of Contaminated Soil Remediation in China — An Interview of Qixing Zhou, Dean of the College of Environmental Science and Engineering of Nankai University), 科学新闻 (Science News), Nov. 11, 2009.

[13] It refers to the basic law at the national level. Although by the end of 2008, some regulations on governing heavy metal problems were promulgated by the MEP, they were not laws yet.

[14] The Environmental Protection Law of the People's Republic of China, effective as of 26 December 1989.

[15] Law of the People's Republic of China on the Prevention and Control of Environmental Pollution by Solid Wastes (Amended), effective as of 1 April 2005.

[16] Agriculture Law of the People's Republic of China, effective as of 1 March 2003.

Revision),[17] and Regulations on Protection of Capital Farmland (1999).[18]

A. The Constitution (1982)

The Constitution of the People's Republic of China[19] is the overarching law of China.[20] Provisions on environmental protection was first inserted in the Constitution in 1978. The current Constitution contains a large number of provisions on environmental protection. These provisions have, from a historical perspective, provided a constitutional basis for public authorities to conduct environmental lawmaking and enforcement. It is a requirement under the Constitution that the state has the competence and obligation to protect environment, and ensure the rational use of natural resources. The Constitution states in article 9: "The State ensures the rational use of natural resources and protects rare animals and plants. The appropriation or damages of natural resources by any organization or individual by whatever means is prohibited."[21]

In addition, article 9 provides: "The State protects and improves the living environment and the ecological environment, and prevents and remedies pollution and other public hazards,"[22] thus "…organizations and individuals using land must ensure its rational use."[23]

The provisions presented above are of great significance for land administration and soil contamination control in China, even though no specific provisions were made for soil contamination. The Constitution shared a basic value of protecting natural resources and controlling environmental pollution. More importantly, it emphasizes that soil environment protection is a duty of the state.

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[17] Land Administration Law of the People's Republic of China (2004 Revision), effective as of August 28, 2004).

[18] Regulations on Protection of Capital Farmland (Decree 257 of the State Council of the PRC), effective as of 1 January 1999.

[19] The Constitution of the People's Republic of China.

[20] There are four Constitutions since the establishment of the PRC, which were enacted in 1954, 1975, 1978 and 1982 respectively. The most recent Constitution was promulgated by the NPC in December 1982 at the 5th National People's Congress. It was amended in 1988, 1993, 1999 and 2004 respectively. The latest amendment was made in 2004.

[21] Id. art. 9.

[22] Id. art. 26.

[23] Id. art. 10.

B. Environmental Protection Law (1989)

The Environmental Protection Law of the People's Republic of China (EPL)[24] is the principal law on environmental protection in China. The law establishes the basic principle of coordinated development between economic construction, social progress and environmental protection, and defines the rights and duties of governments at all levels, all organizations and individuals with regard to environmental protection. The law defines "land" as one element of the ecosystem.[25] It provides that the governments at all levels shall provide for the protection of agricultural environment by preventing and controlling soil pollution, the desertification and alkalization of land, the impoverishment of soil, the deterioration of land into marshes, earth subsidence, damage of vegetation, soil erosion, the drying up of sources of water, the extinction of species and the occurrence and development of other ecological imbalances, by extending the scale of a comprehensive prevention and control of plant diseases and insect pests, and by promoting a rational application of chemical fertilizers, pesticides and plant growth hormone.[26] In addition, the Environmental Protection Law provides instructions for pollution prevention and abatement. For example, it requires the entities that cause environmental pollution and other public hazards to incorporate environmental protection measures into their plans and establish a system for environmental protection and they must adopt effective measures to prevent and control the pollution and harms to environment in various forms.[27]

C. Other National Environmental Laws and Regulations

In addition to the Constitution and the Environmental Protection Law, numerous provisions of lower rank laws and regulations may also be applied

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[24] Environmental Protection Law of the People's Republic of China, effective as of 26 December 1989.

[25] Id. art. 2.

[26] Id. art. 20.

[27] Id. art. 24.

to deal with soil contamination problems. Those provisions are embodied in laws, administrative regulations, bylaws and governmental documents at the national level. Various domains, e.g. pollution prevention, natural resources protection, city planning, agricultural environment protection and ecosystem protection, are covered by those provisions. Important laws and regulations will be discussed as follows.

1. Provisions on Solid Wastes Pollution Control. — The Law of the People's Republic of China on Prevention and Control of Environmental Pollution by Solid Waste[28] is a key piece of legislation on soil contamination prevention and control. The main purpose of this law is to protect human beings' health by preventing and controlling environmental pollution by solid wastes.[29] The law establishes three principles for the management of solid wastes: (i) reducing the discharge; (ii) proper reuse; and (iii) proper treatment.[30] Among others, two provisions are directly involved in soil contamination. First, local governments should bear the costs for dealing with discarded installations or sites which have been historically used for the purpose of storage or treatment of industrial solid wastes.[31] Second, this law can be applied when the liable party cannot be found, or the liable parties exist, but they have insufficient capacity to fulfill their liabilities.

2. Provisions Relating to Atmospheric Environment Protection. — The Law of the People's Republic of China on the Prevention and Control of Atmospheric Pollution[32] may also be applied to soil contamination issues. This law mainly provides for the delineation of acid rain control areas and sulfur dioxide pollution control areas. Under this law, the various administrative authorities under the State Council may: (i) delineate areas where acid rain has occurred or will probably occur as acid rain control areas, in light of the meteorological, topographical, soil and other natural conditions;

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[28] Law of the People's Republic of China on Prevention and Control of Environmental Pollution by Solid Waste, effective as of April 1, 2005.

[29] Id. arts. 1–2.

[30] Id. art. 3.

[31] Id. art. 35.

[32] Law of the People's Republic of China on the Prevention and Control of Atmospheric Pollution (2000 Revision), effective as of 1 September 2000.

and (ii) delineate areas that are seriously polluted by sulfur dioxide as sulfur dioxide pollution control areas.[33] In addition, in the acid rain control areas or sulfur dioxide pollution control areas, enterprises are required to control the discharge amount of atmospheric pollutants within a time limit if regulatory standards are exceeded.[34]

3. Provisions on Land Resources and Agricultural Environment Protection. — The Land Administration Law of the People's Republic of China (2004)[35] provides that governments at all levels shall take measures to maintain and protect irrigation and drainage facilities, ameliorate soil to raise fertility and prevent desertification, salinization, water loss and soil erosion and pollution.[36] In addition, the Agriculture Law of the People's Republic of China (2002)[37] incorporated regimes on regulating soil contamination by encouraging the rational use of chemical fertilizer and pesticides management and improve the quality of arable land. Meanwhile, the Agriculture Law has introduced a registration system as a way of insuring integrated agricultural environment management.[38] Registration and/or licenses are required in respect of the production of pesticides, veterinary medicines, fodder and feed additives, fertilizers, seeds and farm machines, which may endanger the safety of human beings and/or livestock.[39] Provisions on preventing and controlling agricultural environment pollution by waste water, gas and solid waste materials have also been addressed by the same law.[40] The governments at/or above the county levels are obligated to monitor the implementation of such requirements.[41] In addition, lands which have been confirmed as unsuitable for agricultural purposes should be banned for

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[33] Id. art. 18.

[34] Id. art. 30.

[35] Land Administration Law of the People's Republic of China (2004 Revision), effective as of 28 August 2004.

[36] Id. art. 35.

[37] Agriculture Law of the People's Republic of China, effective as of 1 March 2003.

[38] Id. art. 58.

[39] Id. art. 21.

[40] Id. art. 66.

[41] Id.

farming use.[42] Similar provisions on the safety of agricultural products may be found in the Regulations on Pollution-Free Agricultural Product Management (2002),[43] which requires that the environment conditions of the areas that grow pollution-free agricultural products should meet the specific environmental quality standards.[44] Moreover, the Regulations on Land Reclamation[45] introduces a principle, "those who destroy the land should be responsible for reclamation works," to reclaim lands damaged by digging or sinking in the course of construction.

4. Provisions on Protection of Water Resources. — The Rules for the Implementation of the Law of the People's Republic of China on Prevention and Control of Water Pollution[46] may be applied for regulating soil contamination. It provides that in cases where industrial waste water or municipal sewage are used for irrigation, the agricultural administration authorities of governments at county levels and above should organize periodic monitoring of the quality of irrigation water, soil and agricultural products, and carry out appropriate actions to prevent contamination of soil, ground water and agricultural products.[47]

5. Provisions on Ecosystem Protection. — The sites with potential risk of soil contamination, in particular such areas as natural traces, civilization relics, natural reserves and scenic spots, are protected by ecosystem protection rules at different levels. The Regulations of the People's Republic of China on Nature Reserves[48] prescribe that productive installations shall

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[42] Law of the People's Republic of China on Quality and Safety of Agricultural Products, effective as of 1 November 2006.

[43] Regulations on Pollution-Free Agricultural Product Management (Decree 12 of the Ministry of Agriculture of the PRC), effective as of 4 April 2002.

[44] Id. art. 9(1).

[45] Regulations on Land Reclamation (Decree 19 of the State Council of the PRC), effective as of 1 January 1989.

[46] Rules for Implementation of the Law of the People's Republic of China on Prevention and Control of Water Pollution (2000 Revision) (Order 284 of the State Council of the PRC), effective as of March 20, 2000.

[47] Id. art. 24.

[48] Regulations of the People's Republic of China on Nature Reserves (Decree 167 of the State Council of the PRC), effective as of 1 December 1994, art. 32.

not be built in the core area and buffer zone of nature reserves. Nor should the productive installations be built in experimental zones. Installations to be built in these areas cannot exceed the limits of pollutant discharge set up by national or local discharge standards.[49] Meanwhile, projects constructed outside the protection zone of nature reserves should not affect the environmental quality inside the zone.[50]

D. Decrees Promulgated by EPA

As the most important environmental protection authorities of China, the Ministry of Environmental Protection (MEP), the former State Environmental Protection Agency (SEPA), has promulgated numerous decrees with respect to soil contamination problems. For example, the former SEPA promulgated an administrative notice for dealing with contaminated land remediation issues when a company changes its location.[51] The Notice requires that all the industries and laboratories generating hazardous wastes and all the entities yielding or trading hazardous wastes, should provide plans of soil function restoration on the basis of serious monitoring and test, and submit monitoring reports together with the restoration plan to relevant environmental administrative departments before they terminate their business or change the original use of land. Environmental protection departments at various levels should attach importance to soil contamination in the course of land redevelopment.[52]

On 15 December 2009, the MEP issued draft measures for contaminated sites management, the Interim Measures for the Soil Environment Management of Contaminated Sites.[53] This decree is so far the only nontechnical environmental decree for the management of contaminated sites. It consists of six chapters with 29 articles.[54] It defines "contaminated site" as

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[49] Id. art. 32(1).

[50] Id. art. 32(2).

[51] Notice on Preventing Environmental Pollution when Enterprises Are Relocated (2004) (Decree 47 of the SEPA of the PRC), effective as of 1 June 2004.

[52] Id.

[53] Interim Measures for the Soil Environment Management of Contaminated Sites (Draft) (Decree 1321 of the MEP of the PRC), released on 15 December 2009.

[54] Id.

lands where the soil has been contaminated for the reason of (i) toxic and harmful materials; (ii) abandoned materials; and (iii) mining.[55] It imposes liabilities on those who fail to report the environmental conditions of the soil when contaminated site remediation is completed.[56] In addition, the polluter and/or the owner of the land use right may be liable for the soil contamination. Thus the assignees of the land use right may be liable for investigation and remediation expenses if they fail to carry out environmental assessment before they accept the problematic land.[57] Moreover, local governments shall bear the site remediation costs if no liable parties can be reached. As the most important decree for defining the contaminated sites and liability issues, the deliberative draft Measures have been approved by the Commission Conference of MEP on April 2011.[58]

E. Local Legislations

Up to 2005, there were more than 1600 local regulations and rules at provincial and municipal levels.[59] However, for most local governments, there is no specific local regulation or statute in respect of soil contamination issues. There are a few exceptions though. Several cities that suffered severe industry pollution in the history have established rules to regulate contaminated sites monitoring or remediation. In addition, cities with a fast development pace and stronger economic capacities have started their own research and prepared local regulations and technical standards to respond to soil contamination problems. To name a few, Zhejiang province issued the Regulations on Prevention and Control of Solid Waste Pollution in Zhejiang province in March 2006;[60] the Beijing Environmental Protection Bureau

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[55] Id. art. 2.

[56] Id. art. 27(3).

[57] Id. art. 8.

[58] As reported by Wenyin Zhou, the Interim Measures for the Soil Environment Management of Contaminated Sites got approved by the EPM Committee Conference on 25 March 2011, at http://www.zhb.gov.cn/zhxx/hjyw/201103/t20110325_207637.htm (last visited Aug. 30, 2012).

[59] See the State Council of the People's Republic of China, *The National Eleventh Five-Year Plan for Environmental Protection (2006–2010)*, at http://english.mep.gov.cn/down_load/Documents/200803/P020080306440313293094.pdf (last visited Aug. 30, 2012).

[60] The Regulations require that an environmental risk assessment be carried out for contaminated soil.

(EPB) issued the Site Environmental Assessment Guidelines in January 2007;[61] and Chongqing Municipality enacted the Chongqing Regulations on Environmental Protection in May 2007.[62] Shenyang EPB, Shenyang Municipal Planning and Land Resources Bureau jointly issued the Administrative Measures for Contaminated Sites Remediation and Control of Shenyang City (on Trial) in 2007.[63] In addition, Chongqing Municipal Government issued the Notice on Strengthening Industrial Contaminated Sites Treatment and Remediation in 2008, which details the requirements for meticulous conducts of contaminated site risk assessments.[64]

In general, these local regulations have addressed the following issues: (i) Provisions on farmland pollution control. For example, control of farmland non-point pollution,[65] ecological agriculture enhancement, farmland preservation and reclamation,[66] water sources preservation, and waste water irrigation.[67] (ii) Provisions on soil environmental protection in mining areas also cover a broad range of issues, such as environmental impact assessment (EIA), and pollution source control within water areas and clean production methodology. (iii) Solid waste pollution control, landfill gas monitoring,

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[61] The Guidelines mainly stipulate work procedures and technical methods for site environmental assessments within Beijing.

[62] The Regulations mainly provide that before industrial enterprises may relocate, they should first clean up remaining hazardous materials and wastes and remediate any contaminated soil.

[63] The Measures mainly stipulate the evaluation and identification of contaminated sites. See the Interim Administrative Measures of Contaminated Sites Remediation and Control of Shenyang City (Decree 87 of the Shenyang EPB, Shenyang Municipal Planning and Land Resources Bureau of the PRC), released on 25 May 2007.

[64] Notice on Strengthening the Chongqing City's Industrial Contaminated Sites Treatment and Remediation (Decree 208 of the Chongqing City Council of the PRC), effective as of 26 June 2008.

[65] For example, the Regulations on Environment Protection of Shanghai City prescribe that farmers should scientifically employ chemicals, pesticides and agricultural film.

[66] For example, the Regulations on Agricultural Ecology Protection of Anhui Province (1999) and the Regulations on Agricultural Environment Protection of Shandong Province (2004) have definitely put soil protection under the catalogue of agricultural environmental protection.

[67] For example, the Regulations on Agricultural Environmental Protection of Anhui Province prescribe that water quality of the nearest irrigation sources around industry areas should meet the irrigation water quality standard.

medical waste control and nuclear power station radioactive control have also been prescribed by local regulations and rules.

F. Environmental Standards

Environmental standards are promulgated by the MEP and/or other administrative agencies to regulate specific, technical or compliance issues in the environmental context. Generally speaking, environmental standards may fall into five categories: environmental quality standards, pollutant discharge or emission standards, basic environmental criteria, criteria for samples, and criteria for methodology.[68] The environmental quality standards and pollutant discharge standards therein are compulsory standards.[69] Both standards can be divided into national standards and local standards.[70] For a long time, there is no remediation guidance on contaminated land. So far, there are no comprehensive technical guidelines or standards on soil pollution monitoring, contaminated land assessment and soil remediation techniques at the national level. Special concerns should be given to two officially issued essential standards, namely, the Standard for Environmental Quality of Soils in 1995[71] and the Criteria for Environmental Quality Risk Assessment of Soil at Manufacturing Facilities in 1999.[72] The first standard is mandatory. But it regulates agricultural land based on crop safety only. The second is not mandatory and fails to address contamination issues for future land use. Moreover, a series of site management standards and technical guidelines are being drafted or tried out. Typical standards include: (i) standards for environment quality of, including the Standards for Environmental Quality Assessment and Remediation of Soil for Exhibition Sites (Provisional for Shanghai Expo) (HJ 350–2007); (ii) testing standards, including the Technical Specifications for

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[68] The Administrative Measures on Environment Protection Standards (Decree 3 of SEPA of the PRC), effective as of 1 April 1999, art. 3.

[69] Id. art. 5.

[70] Id. art. 3.

[71] The Standard for Environment Quality of Soil (GB15618–1995, the MEPA of the PRC), released on 1 March 1996.

[72] The Risk Meteyard for Environmental Quality of Soil for Industrial Enterprises (HJ/T 25–1999, the MEPA of the PRC, released on 1 August 1999.

Environmental Monitoring of Soil (HJ/T166–2004), the Technical Specifications for Groundwater Monitoring (HJ/T164–2004), and the Specifications for Environment Monitoring of Water (SL219–98) issued by the Ministry of Water Resources; and (iii) monitoring standards, including the Standards for Groundwater Quality (GB/T14848–93), the Standards for Environmental Quality of Soil (GB15618–1995) and the Environmental Quality of Soil for Industrial Enterprises (HJ/T25–1999).

The lack of statutory standards also hinders the effective management of contaminated sites, particularly those in urban areas. As a result, most recently, a series of standards and technical guidance for contaminated sites management are being drafted at the national level by research institutes commissioned by the EMP. For example, the Guidelines for Risk Assessment of Contaminated Sites (2009),[73] the Guidelines for Soil Remediation of Contaminated Sites (2009)[74] and the Technical Guidelines for Environmental Monitoring of Sites (2010)[75] are all published for comments at the moment.

III. EXISTING LAND CONTAMINATION CONTROL REGIMES

Although there is no specific law addressing soil contamination problems, rudimental provisions on land or soil contamination control and remediation can be seen under the current Chinese legal system. However, the practice of prevention and control of soil contamination was still at a preliminary stage over the last ten years.

A. Soil Contamination Monitoring System

Soil monitoring allows for the recording of soil background and pollution status. According to the Technical Specifications for Environmental Monitoring of Soil (HJ/T 166–2004) in 2004,[76] soil environment mornitoring

[73] Guidelines for Risk Assessment of Contaminated Site (Draft) (Decree 1020 of the MEP of the PRC), released on 29 September 2009.

[74] Guidelines for Soil Remediation of Contaminated Sites (Decree 1312 of the MEP of the PRC), released on 10 December 2009.

[75] Technical Guidelines for Environmental Monitoring of Polluted Sites (Decree 99 of the MEP of the PRC), released on 1 February 2010.

[76] Technical Standard for Environmental Monitoring of Soil (HJ/T 166–2004, SEPA), released on 9 December 9 2004.

can be divided into four types, namely, regional soil background monitoring, farmland soil quality monitoring, construction projects monitoring and land contamination incidents monitoring.[77] For these purposes the MEP, the Ministry of Housing and Urban-Rural Development and some other departments have enacted administrive decrees to impose liabilities and obligations of soil contamination monitoring.[78] On December 15, the MEP issued a draft on contaminated sites management, which imposed liabilities on those who failed to report on soil environmetal conditions when contaminated site remediation was conpeleted.[79] Soon afterwards, a draft guideline on techinical issues of monitoring contaminated sites was issued by the MEP on 1 February 2010.[80] The Technical Guidelines for Environmental Monitoring of Polluted Sites provides guidance to contaminated site monitoring.[81]

Under the current soil contamination monitoring system, more than one department, both at the central and local levels, have the legal authority to regualte the contaminated site monitoring. For example, the Urban-Rural Development Administrative Departments, the Agricultural Management Departments, the MEP and EPBs, departments of water resource management and so on are all involved in this system. However, other than several local regulations, no specific provisions have been made to divide or

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[77] Id.

[78] For example, the Administrative Measures on Monitoring of Pollution Sources (Decree 246 of SEPA of the PRC), effective as of 1 November 1999); the Administrative Measures on Municipal Domestic Garbage (Decree 175 of the Ministry of Housing and Urban-Rural Development of the PRC), effective as of July 1, 2007, art. 28(8); the Technical Standard for Centralized Processing Projects on Chemical Disinfection of Medical Wastes (On Trial) (HJ/T 228–2005, SEPA of the PRC), effective as of March 15, 2006, art. 12.9.7; the Technical Standard for Centralized Processing Projects on Microwave Disinfection of Medical Wastes (On Trial) (HJ/T 229–2005, SEPA of the PRC), effective as of March 15, 2006, art. 12.9.7.

[79] Interim Measures for Environmental Management of the Soil of Contaminated Sites (Draft) (Decree 1321 of the MEP of the PRC), released on 15 December 2009, art. 27(3).

[80] Letter on Soliciting Opinions on the Interim Measures for Environmental Management of Soil of Contaminated Sites (Draft) (Decree 99 of the MEP of the PRC), released on 1 February 2010.

[81] Technical Guidelines for Environmental Monitoring of Contaminated Sites (Draft) (Decree 99 of the MEP of the PRC), released on 1 February 2010.

coordinate the legal authorities among the relevant departments or agencies. For example, chapter 2 of the Administrative Measures for Remediation and Control of Contaminated Sites of the Shenyang City[82] provides for a joint management mechanism for soil contamination assessment and remediation, under which the EPBs, planning bureaus, national land resources management bureaus, mining management bureaus and construction management bureaus share a joint management authority to prevent and control soil contamination.[83] In addition, local governments may have the legal authority to make plans of soil contamination prevention, organize investigations in soil contamination or modify the utility of contaminated lands. A local legislation enacted by Zhejiang province may serve as an example.[84]

B. Site Assessment and Reporting

A site assessment determines whether soil contamination poses an actual or potential risk to human health or the environment. It is of sufficient magnitude to warrant contaminated land remediation and management. China has established a system of Environmental Impact Assessment (EIA), under which all construction projects that may have an adverse impact on the environment must carry out an assessment of the environmental impact.[85] The systems were instituted in a fashion of command and control, meaning that violation of any of the systems shall lead to administrative sanctions, and in very severe cases, criminal punishment. Under the current legal system, the site assessment mechanism has been stipulated by several laws and regulations. Those provisions mainly concern about farmland protection. The Law of the People's Republic of China on Quality and Safety of Agricultural Products[86] provides that, based on the assessment

[82] Administrative Measures on Remediation and Control of Contaminated Sites in Shenyang City) (Decree 87 of the Shenyang EPB of the PRC), released on May 25, 2007.

[83] Id. art. 12.

[84] Regulations on Prevention and Control of Pollution by Solid Waste of Zhejiang Province, art. 16.

[85] This system is regulated by article 13 of the Environmental Protection Law, all departmental laws on pollution and special regulations on EP for construction projects.

[86] Law of the People's Republic of China on Quality and Safety of Agricultural Products,

result, farmlands should be zoned as farming-prohibitory areas if land conditions are no longer suitable for specific corps.[87] The Land Administration Law of the People's Republic of China (2004 Revision) provides a ranking system to land within the territory.[88] The Provisions on the Administration of Restricted Use of Pesticides[89] require that reports on the toxicity of the subject pesticide must be submitted, because those pesticide residues accumulate in soils and this makes the governments seek to impose a ban. Moreover, the Measures for the Prevention and Control of Environmental Pollution by Discarded Dangerous Chemicals[90] adopted by the SEPA in 2005 also requires that soil and underground water assessments should be carried out on production of dangerous chemicals in addition to the EIA reporting requirements.[91]

Quite recently, the MEP is planning to promulgate a new order on site assessment for systematic application of site assessment all over China. The Interim Measures for Environment Management of Contaminated Land (Draft)[92] was open to public for evaluation on 15 December 2009.[93] The circumstances in which investigations into and assessments of contaminated land should be launched and the contents and procedures of such investigations and assessments have been covered by this draft. The whole process of investigation and assessment has been, according to the draft, divided into three steps, namely, preliminary investigation, detailed investigation and risk assessment.[94]

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effective as of 1 November 2006.

[87] Id. art. 15.

[88] Land Administration Law of the People's Republic of China (2004 amended), effective as of 28 August 2004.

[89] Provisions on the Restricted Use of Pesticides, art. 7(4), effective as of 1 August 2002.

[90] Measures for the Prevention and Control of Environmental Pollution by Discarded Dangerous Chemicals, effective as of 1 October 2005.

[91] Id. arts. 10, 14.

[92] Interim Measures for Environment Management of the Soil of Contaminated Sites (Draft), released on 15 December 2009.

[93] Letter about Soliciting Opinions on the Technical Guidelines for Environmental Monitoring of Sites (Draft) (Decree 99 of the MEP of the PRC), released on 1 February 2010.

[94] Interim Measures for Environment Management of the Soil of Contaminated Sites (Draft) (Decree 1321 of the MEP of the PRC), released on 15 December 2009.

C. Contaminated Land Treatment and Remediation

There is an increasing awareness in China that treatment and remediation of contaminated land should be prudential components of the soil contamination management system. In order to prevent the spread of noxious substances, decontamination and sealing-up of noxious substances on site are the most frequently used strategies by other countries to remove or minimize noxious substances on contaminated soils with former industrial and commercial sites, former military bases, or abandoned and illegal waste disposal sites.

At the central government level, the SEPA has promulgated several regulations on contaminated land treatment. For example, the Measures for the Administration of Registration of Dangerous Chemicals[95] which require a timely response, such as enclosing, isolating or decontaminating, before damage or potential damage to soil is caused by chemical accidents. Another SEPA decree, the Technical Standard for Solid Waste Cleaning for Reservoir Bed of the Three Gorges on Yangtze River,[96] requires removal and treatment of contaminated soil at construction sites of the Three Gorges. Most recently, the MEP is planning to set up a remediation system of contaminated site by promulgating the Interim Administrative Measures for Environment Management of the Soil of Contaminated Sites (Draft).[97] The following aspects have been addressed: (i) Under what circumstances that the remediation and reclamation be launched?[98] (ii) basic requirements for reclamation projects planning and implementation;[99] (iii) technical requirements on remediation and reclamation projects;[100] (iv) engineering

[95] Measures for the Administration of Registration of Dangerous Chemicals (Order 344 of the State Council of the PRC), effective as of 15 March 2002, art. 52(3).

[96] Technical Standard for Solid Waste Cleaning for Reservoir Bed of the Three Gorges on Yangtze River (HJ 85–2005, SEPA and State Council Three Gorges Project Construction Committee Executive Office of the PRC), released on 13 June 2005, art. 4.1.

[97] Interim Measures for Environment Management of the Soil of Contaminated Sites (Draft) (Decree 1321 of the MEP of the PRC), released on 15 December 2009.

[98] Id. art. 15.

[99] Id. arts. 16–17.

[100] Id. art. 18.

supervision and administration of remediation and reclamation projects;[101] (v) working environment and health protection.[102] Besides, treatment like contaminated soil incineration and replacement of soil have also been prescribed by local regulations.[103]

In addition to SEPA regulations, provisions on contaminated land treatment, remediation or reclamation can be found in some local regulations. For those severely polluted farmlands, according to the Regulation on Prevention and Control of pollution by Solid Wastes of Zhejiang Province,[104] their function should be modified and risks of contaminated sites should be assessed and remediated after cooperation concludes. Similar provisions have been made by the Measures for Land Reclamation in Benxi City[105] and the Administrative Measures for Remediation and Control of Contaminated Sites of Shenyang City.[106]

D. Soil Contamination Liability Regimes

Briefly, China's soil contamination liability regime determines who should be liable for soil contamination and the liabilities should be divided among various contributors. Unfortunately, there are no specific provisions on who should foot the bill for soil contamination if liable parties cannot be identified or lack the financial ability to fulfill their obligations. Civil liabilities, administrative liabilities and criminal liabilities on soil contamination are all available under the current legal system in China.

1. Civil Liabilities. — The legal basis for pollution compensation claims

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[101] Id. art. 19.

[102] Id. art. 20.

[103] Contingency Plan for the Accident of Benzene Leaking on 21 January 2006 in Taiyuan City of Shanxi Province (Order of the Taiyuan City Council of Shanxi province of the PRC), released on 22 January 2006, art. 2(2).

[104] Regulations on Prevention and Control of Pollution by Solid Wastes of Zhejiang Province (Decree 54 of the People's Congress of Zhejiang Province of the PRC), released on 9 March 2006, art. 17.

[105] Measures for Land Reclamation in Benxi City (Decree 55 of the Government of Benxi City of the PRC), released on 30 March 1998.

[106] Administrative Measures for Remediation and Control of Contaminated Sites in Shenyang City) (Decree 87 of the Shenyang EPB of the PRC), released on May 25, 2007.

can be found in the General Principles of the Civil Law (hereinafter, the "General Principles") and the Environmental Protection Law. Article 124 of the General Principles prescribes that any person who pollutes the environment and causes damage to others in violation of state provisions on environmental protection and prevention of pollution shall bear civil liabilities in accordance with the law.[107] Article 41 of the Environmental Protection Law prescribes that "[A] unit 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."[108]

At the same time, a number of specialized environmental protection statutes on air, water, solid waste and other issues also contain provisions concerning liabilities for soil contamination.[109] The EPL sets forth certain defenses against liability. For example, if the harm is caused by pollution that resulted solely from natural disasters where reasonable precautionary measures were promptly taken then no liability shall be imposed.[110] On 26 December 2009, the Tort Liability Law of the People's Republic of China[111] has been approved by the Standing Committee of the 11th NPC and came into force on 1 July 2010. Three important rules on the distribution of civil liabilities for environmental pollution have been confirmed by this law.

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[107] General Principles of the Civil Law of the People's Republic of China, effective as of 1 January 1987, art. 124.

[108] Environmental Protection Law of the People's Republic of China, art. 41.

[109] See Marine Environmental Protection Law of the People's Republic of China, effective as of 1 April 2000), arts. 32–40; Law of the People's Republic of China on Prevention and Control of Water Pollution (2008 Revision), art. 46, effective as of Jun 1 2008; Law of the People's Republic of China on the Prevention and Control of Atmospheric Pollution (2000 Revision), art. 46; Law of the People's Republic of China on Water and Soil Conservation, arts. 32–42, effective as of 1 March 2011; Law of the People's Republic of China on the Prevention and Control of Environmental Pollution by Solid Waste, effective as of 1 April 2005, arts. 53–64; Law of the People's Republic of China on Prevention and Control of Radioactive Pollution, effective as of 1 October 2003, arts. 42–45.

[110] Environmental Protection Law of the People's Republic of China, art. 41: "If environmental pollution losses result solely from irresistible natural disasters which cannot be averted even after the prompt adoption of reasonable measures, the party concerned shall be exempted from liability."

[111] Tort Liability Law of the People's Republic of China, effective as of 1 July 2010.

(1) Polluter pays principle (PPP). Article 65 of the Tort Liability Law confirms the PPP as a general principle. Where any harm is caused by environmental pollution, the polluter shall assume the tortious liability.[112]

(2) Strict liability. Article 65 of the Tort Liability Law establishes a general principle for a polluter's liability, that the polluter shall bear tortious liability without regard to fault (strict liability) if the damage is caused by environmental pollution. To challenge such liability, the company or individual responsible for the damage of pollution bears the burden of proving that it is entitled to an exemption from or mitigation of liability under the law, or that there is no relationship between his conduct and the environmental pollution that caused the damage.[113]

(3) Joint liability. Where damage is caused by pollution attributable to a third party, the victim may seek compensation from either the polluter or the third party. The polluter, after paying compensation, shall be entitled to be reimbursed by the third party.[114] If two or more companies or individuals are responsible for the pollution, the proportion of damages for which each party is liable shall be determined according to the type of pollutants, the volume of emissions and other factors.[115]

2. Administrative Liabilities. — Individuals or administrative departments that fail to fulfill their responsibilities in respect of soil contamination management and control are subject to administrative liabilities. For example, the Law of the People's Republic of China on Prevention and Control of Environmental Pollution by Solid Waste prescribes that administrative

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[112] Id. art. 65. This standard has embedded in some local environmental regulations related to contaminated sits management. For example, the Regulations of Zhejiang Province, parties that develop or use the former address after the polluting enterprise moves are responsible for cleanup and disposal of the contaminated land. The parties that pollute the soil shall bear the cost of cleaning up the contaminated land. If there is no definite responsible party or the responsible party is totally disabled, then the local government bears the cost of cleanup. See the Regulations on Prevention and Control of Pollution by Solid Wastes of Zhejiang Province, art. 17.

[113] Tort Liability Law of the People's Republic of China, art. 65.

[114] Id. art. 68.

[115] Id. art. 67.

liabilities may result from environmental pollution (incl. soil contamination) such as improper disposal of solid wastes.[116] People who fail to monitor the quality of soil when dealing with discarded dangerous chemicals are subject to administrative penalties.[117] Some local regulations, as mentioned earlier, also have provisions on administrative responsibilities.[118]

3. Criminal Liabilities. — As a basic environmental resource, soil environment is automatically covered by provisions on environmental protection of the Criminal Law and criminal liability clauses of relevant environmental protection laws.[119] As a basic law, the Criminal Law of the People's Republic of China (1997)[120] has a general clause on punishing crimes for undermining the protection of environmental resources, which states:

> *Whoever releases, dumps, or disposes of radioactive wastes, wastes containing pathogen of contagious diseases, and toxic materials or other dangerous wastes into land, water, and the atmosphere in violation of state stipulations, causing major environment pollution accidents, heavy losses to public and private property, or grave consequences of personal deaths and injuries shall be sentenced to not more than three years of fixed-term imprisonment or criminal detention, and may in addition or exclusively be sentenced to a fine; and in exceptionally serious consequences, not less than three years and not more than seven years of fixed-term imprisonment, and a fine.*[121]

Meanwhile, illegally occupy farmland for other uses in a relatively large

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[116] Law of the People's Republic of China on the Prevention and Control of Environmental Pollution by Solid Wastes, art. 58.

[117] Measures for the Prevention and Control of Environmental Pollution by Discarded Dangerous Chemicals (Order 27 of SEPA of the PRC), effective as of 1 October 2010, art. 25(1).

[118] Administrative Measures for Remediation and Control of Contaminated Sites of Shenyang City of China, chapter 5; Regulations on Prevention and Control of Pollution by Solid Wastes of Zhejiang Province of China, art. 52.

[119] It should be noted that article 40 of the Environmental Protection Law, article 61 of the Law of the People's Republic of China on the Prevention and Control of Atmospheric Pollution and article 57 of the Law on the Prevention and Control of Water Pollution are all related to article 338 of the Criminal Law of the People's Republic of China (1997).

[120] Criminal Law of the People's Republic of China (2007 Revision), effective as of 1 October 1997, art. 338.

[121] Id.

area and causing damage to large tracts of farmland has also been listed as a crime in the Criminal Law.[122] There are some concerns about ambiguity of "heavy losses" or "grave consequences" which may give arise to defense arguments.[123] Even if convicted, the relative short prison terms are unlikely to provide a proper deterrent or protect public health.

IV. PROBLEMS OF CURRENT REGULATORY FRAMEWORK

As noted earlier, in present-day China, soil contamination has become one of the most serious problems that have profoundly impacted people's health and living conditions and arguably the sustainable development of Chinese society. It is likely that along with rapid industrial development, agricultural modernization and urban construction, a growing number of contaminated sites will be discovered in the near future. Although the central government has made responses to this emergent crisis together with its ministries, it should be noted that apart from several local regulations, there is no comprehensive national law on soil contamination in China. Moreover, the existing legal system is far from sufficient and effective to address the problems of deteriorating contaminated land. Fragmented governance by the existing regulatory framework weak administrative organization and capacity, limited technical knowledge and controversies over the latest proposals have jointly made it a great challenge for China's legislative efforts on addressing the problems.

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[122] Criminal Law of the People's Republic of China (2007 Revision), article 342 provides: "Those who illegally occupy farmland for other uses in violation of land administrative law and regulations in a relatively large area and cause damage to large tracts of farmland are to be sentenced to not more than five years of fixed-term imprisonment or criminal detention, and in addition be sentenced to a fine or may be sentenced to a simple fine."

[123] On 28 July 2006, the Supreme People's Court of China issued a judicial interpretation that sets a relatively low threshold for the application of articles 338 and 339 in the case of "major environmental pollution accidents." Although this Judicial Interpretation provided for detailed consequences of different severity, several uncertainties may remain in the context of contaminated land cases in China. One obvious reason is that there is no evaluating regime for losses (economic and health) resulted from land contamination. See the Interpretation of the Trial of Criminal Cases of Environmental Pollution by the Supreme People's Court of China, effective as of 28 July 2006).

A. No Integrated National Legislation with Clear Objectives and Principles

The first challenge identified by this study is the lack of integrated legislation as a response to China's soil contamination problems. A comprehensive national legal framework with clear policy objectives and principles is a prerequisite at the central government level for dealing with the problems of soil contamination. Due to the absence of an integrated legislation and effective technical approaches, the existing regulatory frameworks on contaminated land in China lack integration and long term planning. Lessons from China's local practices and international communities show that an effective regulatory framework for contaminated land management consists of mechanisms which include, *inter alia*, risk assessment, remediation, spatial planning, aftercare and monitoring.[124]

B. Inadequate Technological Support

Experienced administrators and dedicated organizations for management of contaminated land are extremely limited in numbers both at the central and local levels. Insufficient technical support to the management and treatment of contaminated land commonly exists in the current legal and policy context. The prevention and control of land contamination is a relatively new concern in China. There lacks necessary expertise and experience. In addition, it is clear that the existing legal system for regulating contaminated land is not functioning optimally. For example, the Environmental Standard for Soil Quality was developed several years ago. It has been intensively criticized as it is unable to deal with current problems effectively. As a response, a new stand is currently under evaluation by the MEP.[125]

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[124] For example, the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of the U.S. established soil contamination risk assessment regime and the famous Superfund as monetary sources for contaminated sites remediation and redevelopment. Similar regimes can be found in the part II-A of the Environmental Protection Act (1990) of the UK, which is titled as "the Contaminated Land Act."

[125] Announcement on Amending the Soil Environmental Quality Standard (Decree 918 of the MEP), released on 18 September 2009.

C. Absence of Financial Incentives and Financial Support

In the present legal and policy context, financial incentives for cleanup and reclamation of contaminated land have not been fully developed by policy makers. This hinders the effective solution of issues of land contamination. Funding mechanisms appear in some local regulations. However, there are no developed and coordinated approaches for the guarantee of proper implementation of the provisions. Financial incentives should be adopted to encourage voluntary prevention and remediation actions. In this regard, a number of costs incurred for conducting or financing relevant environmental activities should be tax deductible; and grants or trust funds should also be available for the analysis, removal, storage, treatment or disposal of waste materials that may potentially or are actually causing soil contamination.

D. Unsolved Overlapping Mandates

As an inherent drawback of China's environment management system, overlapping mandates have weakened the coherence and effectiveness of policies on soil contamination, leading to complexity of the institutional and governance framework, as well as sector-by-sector fragmentation. Conflicts of interest emerge among different levels, between departmental agencies and within the complex "dualism" of Party and government bodies. In terms of environmental monitoring, environmental agencies at four levels have set up a large network. But other agencies such as those for agriculture and water resources also have their own environmental monitoring networks. In addition, the monitoring results of the same environmental parameters by different agencies often differ greatly and data is not effectively shared.[126] This situation also occurs in soil contamination monitoring.

E. Weak Enforcement at Local Government Levels

There are no proper solutions of conflicts of interest between the central

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[126] Asian Development Bank, *Country Environmental Assessment in the People's Republic of China (2007)*, at http://www.adb.org/Documents/Produced-Under-TA/39079/39079-PRC-DPTA.pdf (last visited Aug. 30, 2012).

and local governments. Provisions on soil protection and prevention and control of soil contamination can easily encounter weak "local protectionism" in China. Local protectionism means that local governments let their own local interest prevail over national concerns. The implementation of central directives becomes particularly challenging considering four main local governance weaknesses: (i) modest administrative capacity of local officials; (ii) low accountability, as governmental structures are often not yet developed enough to effectively monitor and evaluate policies besides top-down mechanisms; (iii) weak rule of law, as local courts have a weak institutional status; (iv) limited citizen representation and participation.[127]

In China, particularly in some rural areas, small enterprises often have little or no incentive to implement environmental protection facilities. Whenever a conflict may impact the interest of local governments, local governments will tend to exercise such protectionism through their control over the budgets and personnel management of their local bureaucracies, including courts, procuratorates, and police and administrative departments such as bureaus of industry and environmental protection. As a result, some plants generate large amount of heavy metal pollutants. But local EPBs and governments can hardly provide due monitoring until serious incidents occur.[128] The current laws and policies are unable to break up local protectionism solely by granting central environmental authorities sufficient legal authority and resources (human and financial) in the context of soil contamination incidents, especially in those areas where local governments fail to fulfill their legal duties. The absence of a national law on contaminated land may, to some extent, weaken the enforceability of the current regulations

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[127] OECD, *OECD Rural Policy Review: China*, at 5 (2009).

[128] For example, the Dongling Lead and Zinc Smelting Co. in Fengxiang county in the city of Baoji, had been ordered to suspend the production of lead and zinc after sporadic cases of lead poisoning of villages near the factory site. The scandal has shed light once again on the dilemma faced by many places of China when industrial development poses threat to the environment and people's health. The smelter started production in 2006, which contributed to 17% of Fengxiang county's GDP in 2008. To some extent, the plant also benefited the villagers, some of whom secured jobs at the factory while others earned extra money by leasing houses to migrant workers or running grocery stores and eateries that were more often frequented by the factory workers than local peasants. Xinhua News Agency, Smelter at Center of Lead Poisoning Scandal Shut Down, China Daily, Aug. 19, 2009.

at local government levels.

CONCLUSION

China now remains heavily reliant on its general regulations on environmental protection to regulate land polluting activities. Obviously, this has been proven insufficient to enable China to properly address the problem of soil contamination. Therefore, here present several recommendations on the basis of observation.

Firstly, with the nature and extent of problems of soil contamination better understood in China, it is recommended that a specific national legislation be enacted. There are several reasons for this.[129] On the one hand, in order to address historic soil contamination, it is necessary to impose liabilities on responsible parties retrospectively, including parties that did not act contrary to any law in place at the time of committing the acts or omissions that have resulted in site contamination. General legislations on environmental protection do not normally provide for such retrospect and this must therefore be provided for in a specific legislation to address the problems of historic site contamination. On the other hand, a specific legislation is to provide for the relevant scientific or technical framework that is now widely applied to the identification, assessment and remediation of contaminated sites. Finally, there is an emerging trend of encouraging the redevelopment of contaminated sites, including offering relief from future liabilities to those who undertake voluntary remediation of sites. Examples of specific legislations on addressing issues of site contamination are overwhelming in the U.S., the U.K. and other developed countries. The Brownfields Revitalization Act of 2002 (Amendments to CERCLA) is one of them, which is to speed up cleanup activities. Similar legislations have also been adopted in the U.K., and new measures (part II-A) were inserted into the existing Environmental Protection Act (1990).

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[129] Actually, specific legislation on contaminated land has been recommended by almost all of the advocates of the law. See Shuyi Wang, 关于制定《中华人民共和国土壤污染防治法》的几点思考 (Several Thoughts on the Enactment of Law on Control of Soil Pollution of the PRC), (3) 法学评论 (Law Review) 73 (2008).

Secondly, it is commonly accepted that China can learn from international experiences, particularly from the U.S. and the U.K. and other jurisdictions which have developed advanced systems for the control and prevention of land contamination.[130] However, foreign experiences, in some cases, cannot be directly applied to a country like China unless they are considered as appropriate in specific social environmental context. It should be noted that, in a system of private ownership of property, which is well developed in the U.S. and the U.K., liabilities for hazards and damages associated with a given property is normally based on the title of land. Owners are presumed to have benefited from the actions they took that caused harm to others. However, as a general rule, land in urban areas is owned by the country and land in rural areas is owned by rural collective economic organizations and can only be used for agricultural purposes in China.[131] Therefore, to what degree the ownership issue will impact the land user's liability is still unclear. China applies a system of public ownership to all land.

Thirdly, a proper liability mechanism should be established for a better judicial treatment of issues of land contamination. As we noted above, China has adopted strict liabilities and joint and several liabilities under the current legal system of environmental protection. However, those provisions cannot stipulate appropriately liabilities on land contamination. China should adopt a more flexible liability regime on land contamination, in which the following

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[130] The first national legislative research program, the "Soil Contamination Legislative Investigation and Research, together with the Draft Proposal Project" (99 [2006] EPA Project), was held by the Environmental Law Research Institute (ELI) at Wuhan University from 2006 to 2008. In 2007, the Proceedings of Conference in 2007 of the Association of Environment and Resources Law of the China Law Society was held at Wuhan University, legislation on soil contamination is the main topic in this conference. In addition, comparative studies on legislation on soil contamination have also been carried out by numerous Chinese scholars. For example, a leading project of the Youth Scholar Program, titled "the Research on Soil Contamination Legislation in China", was approved by the Ministry of Justice of the PRC (Project 07SFB3034, 2007–2009) in 2007.

[131] There are specific provisions on land ownership in several key Chinese laws and regulations. To name a few, article 10 of the Constitution of the People's Republic of China; articles 47, 48, 58, 59 and 60 of the Property Law of the PRC; article 8 of the Land Administration Law of the PRC and articles 2 and 4 of the Implementing Regulations of the Land Administration Law of the PRC.

principles should be considered.

(1) The principle that polluter pays (PPP). People who directly cause contamination to land should be responsible for all costs of pollution where they can be identified and have provide financial resources to remediate the property. However, the American experience shows that the PPP should be extended under certain circumstances of contaminated land remediation. The law should burden not only the firms and individuals engaging in contaminating activities, but also those that might produce pollution, with costs of reparations and repair via assignment of liability to "all parties" in the chain of a title.

(2) Establishment of state liabilities. It is common that in a case of land contamination, no private party can be identified as responsible for pre-existing contamination. Or, even if a private party is responsible, remediation is required only if the private party continues to be a functioning legal entity with the ability to pay. Therefore, central and local governments are obligated to shoulder the burden of remediation or conduct activities of emergency reposing in the above context.

(3) Retroactive liabilities. This is sometimes discussed in the context of a basic requirement for fairness. However, it is also an issue of fairness considering that the original polluter was acting in accordance with the existing law when the pollution occurred. The issue of retrospect has raised concerns in many jurisdictions and where adopted in extenuating circumstances is often justified on the basis of spreading the risk. The retroactive liability may fall on the original polluter, the current owners of polluted assets, or the government.

Finally, public participation should be encouraged in the management of land contamination. The complexity and quantity of issues of land contamination confronting all countries has overwhelmed the capacity of even the strongest and best prepared governments. This requires that governments encourage and embrace an open and transparent decision-making and implementation process. International experience confirms that multiple stakeholders and public involvement in environmental policy making and implementation process can result in stronger regulations, strengthen understanding of policy goals, and increase the likelihood of

successful implementation of environmental policies. As a result, the Chinese government should promote public participation in environmental issues and encourage more people to contribute to addressing issues of land contamination. The efforts of the central government, local governments and the public in combating soil contamination should be coordinated with more stakeholders and citizens involved.