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Food and Fertile Ground: Improving Chinese Food Safety Through Environmental Regulation

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Articles

FOOD AND FERTILE GROUND: IMPROVING CHINESE FOOD SAFETY THROUGH ENVIRONMENTAL REGULATION

*Brent Domann**

I. INTRODUCTION	2
II. CHINESE FOOD SAFETY	3
<i>A. Food Safety Goals</i>	3
<i>B. History of Food Safety in China</i>	5
1. 1949–1977: From Revolution to Economic Reform	7
2. 1978–1992: Economic Reform to Regulatory Consolidation.....	9
3. 1993–2015: Regulation of a Single but Segmented Industry	10
<i>C. Current Regulations and their Effectiveness</i>	11
III. CHINESE INDUSTRIALIZATION AND ENVIRONMENTAL PROTECTION	12
<i>A. History of Industrialization in China</i>	12
<i>B. Urbanization and the Bifurcation of Chinese Demographics</i> .	14
<i>C. Environmental Quality Problems and their Effects on Food Supply</i>	15
IV. STATEMENT OF THE PROBLEM AND SOLUTION	19
V. COUNTERARGUMENTS	21
VI. CONCLUSION	23

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I. INTRODUCTION

Food safety in China has a mixed reputation.¹ Although it has a brief history, it has made great strides in incorporating new solutions to classic problems of sufficiency, security, and safety.² Still, it is imperfect. From tainted baby formula to contaminated strawberries, both domestic and international Chinese food scandals have garnered a lot of attention.³ From the Chinese government's perspective, faith in Chinese food safety is important for economic reasons, as foreign importers seek Chinese food.⁴ Additionally, the Chinese government's domestic reputation and political security depend on a populace that trusts the efforts of the sovereign state.⁵

As its consumer class rapidly expands, China is building an increasingly effective and detailed model for food regulation.⁶ Issues of food safety, food security, and accuracy in representing the contents and methods of production of food items are moving to the front and center of both consumer expectations and regulatory attention.⁷

¹ See, e.g., Lin Fu, *What China's Food Safety Challenges Mean for Consumers, Regulators, and the Global Economy*, BROOKINGS (Apr. 21, 2016), <https://www.brookings.edu/blog/order-from-chaos/2016/04/21/what-chinas-food-safety-challenges-mean-for-consumers-regulators-and-the-global-economy/> (noting China's past food safety scandals, but also discussing China's proposed attempts to improve food safety reputation).

² See GUANQI ZHOU, *THE REGULATORY REGIME OF FOOD SAFETY IN CHINA: GOVERNANCE AND SEGMENTATION* 4 (2017) (noting that the current regulatory scheme has only been around since 1950, but has stabilized and institutionalized food safety in China); see also Fu, *supra* note 1 (discussing China's commitment to strengthening regulations and oversight across the entire supply chain); see also FRANCIS SNYDER, *FOOD SAFETY LAW IN CHINA: MAKING TRANSNATIONAL LAW* 474 (2015) ("China has made tremendous strides since the 1995 Food Hygiene Law in improving its system of food safety regulation . . .").

³ For an in-depth discussion of Chinese food scandals, see *infra* Part II(c).

⁴ See Fu, *supra* note 1 ("Improving food safety in China is also important for international consumers because food and ingredients from China can be found on supermarket shelves all over the world.").

⁵ *Id.*

⁶ See Kim Iskyan, *China's Middle Class is Exploding*, BUS. INSIDER (Aug. 27, 2016, 9:09 PM), <http://www.businessinsider.com/chinas-middle-class-is-exploding-2016-8> (discussing China's rapidly expanding middle class and the growing rate of Chinese consumption); see also John Balzano, *Revised Food Safety Law in China Signals Many Changes and Some Surprises*, FORBES ASIA (May 3, 2015, 11:06 PM), <https://www.forbes.com/sites/johnbalzano/2015/05/03/revised-food-safety-law-in-china-signals-many-changes-and-some-surprises/> (discussing how the revision of the Food Safety Law has the ability to make China's regulation of food safety more effective).

⁷ See Andrew Sim, *China: An Overview of the New Food Safety Law*, FOOD SAFETY MAG. (Apr. 19, 2016), <https://www.foodsafetymagazine.com/newsletter/china-an-overview-of-the-new-food-safety-law/> ("[The new Food Safety Law] shows the proactive attitude of the Chinese government in cracking down on food scandals that have affected the country in

China is not, however, just an urban, consumption-based economy. Despite an incredible migration toward urbanization and transition to manufacturing, a rural population remains; additionally, there are citizens that live in rapidly urbanizing areas that nevertheless employ some traditional means of food production by growing their own food supply.⁸ These rural and semi-rural citizens benefit from food regulation in the aggregate, but are particularly prone to suffering the negative results of regulatory failures elsewhere in China's economy.⁹ More specifically, China's comparatively lax regulation of environmental quality has a direct impact on the food supply for those who eat what they grow. Without a defined and symbiotic relationship between food safety and environmental regulations, China's regulatory scheme for the food supply can never be complete.

This paper explores the historical development of food safety regulation in China and highlights how the bifurcation of urban and rural populations leaves a regulatory gap that limits the efficacy of food safety regulation. Part II discusses food safety in China as the nation's politics have evolved over the last century. Part III surveys China's industrialization and urbanization, examines the bifurcation of urban and rural populations, and discusses current environmental issues. Part IV defines the resulting problem and suggests a solution: unless environmental regulations related to food-producing natural resources are a part of China's regulatory scheme, consumer-focused food safety regulation cannot protect those who produce their own food. Part V considers counterarguments before this paper concludes in Part VI.

II. CHINESE FOOD SAFETY

A. Food Safety Goals

Food safety laws are designed for several purposes: safety, security, and public health and economics (as a paired set of concerns). Each of

recent years, leading to poor consumer confidence in domestic products. . . . The new law places more emphasis on the supervision and control of every step of food production, distribution, sale and recall.”)

⁸ See *infra* Part III(B); see also Zhuang Pinghui, *Urban Farming a Growing Trend in China*, SOUTH CHINA MORNING POST (Aug. 19, 2012, 10:21AM), <http://www.scmp.com/business/china-business/article/1018114/urban-farming-growing-trend-china> (describing the growing popularity of urban farming).

⁹ See ZHOU, *supra* note 2, at 4–5 (discussing the variation in food safety levels in China amongst different socio-economic classes).

these purposes, or pillars, benefits consumers in a unique way and, as a whole, serve a holistic role in fostering an optimal food marketing or distribution scheme.

An ancient concept for healthy consumption,¹⁰ *food safety* includes, “many facets of handling, preparation and storage of food to prevent illness and injury [including chemical], microphysical and microbiological aspects.”¹¹ The focus of a food safety regime is to avoid injury or sickness as a result of contamination, improper handling, or adulteration.¹² In pursuit of these aims, major attention is given to labeling, hygiene, and chemicals (such as additives and pesticides), with even more attention given to providing for safe food delivery and preparation.¹³

Food security relates to food’s availability to a population.¹⁴ Put another way: to provide for greater food security, an entity must ensure that people have enough food available and secure access to that food.

Public health and economics are two major considerations that, together, inform food safety laws and serve as goals for those laws.¹⁵ Public health is a fundamental goal and primary responsibility for government.¹⁶ Governments with healthy, well-supplied populations

¹⁰ Takashi Uemura & Md. Latiful Bari, *History and Safety of Food: Past, Present and Future*, in *FOODBORNE PATHOGENS AND FOOD SAFETY* 2–3 (Md. Latiful Bari & Dike O. Ukuku eds., 2015) (“[F]ood safety . . . is probably nearly as old as human history itself and may have started with the recognition and subsequent avoidance of foods that were naturally toxic.”).

¹¹ Kelly Way, *Travel Health Concerns*, in *FOOD SAFETY: RESEARCHING THE HAZARD IN HAZARDOUS FOODS* 454 (Barbara Almanza & Richard Ghiselli eds., 2014).

¹² *Id.*

¹³ V. Balambal Ramswamy, *Ethical Values of Food Safety*, in *FOOD SECURITY AND FOOD SAFETY FOR THE TWENTY-FIRST CENTURY: PROCEEDINGS OF APSAFE2013* 35 (Soraj Hongladarom ed., 2015).

¹⁴ FOOD AND AGRIC. ORG. OF THE UNITED NATIONS, *TRADE REFORMS AND FOOD SECURITY: CONCEPTUALIZING THE LINKAGES* 29 (2003) (“Food security exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food which meets their dietary needs and food preferences for an active and healthy life.”).

¹⁵ Food safety laws help avoid foodborne illnesses and food security laws help avoid malnutrition and undernutrition. See Irene B. Hanning et al., *Food Safety and Food Security*, *NATURE EDUC. KNOWLEDGE* (2012), <https://www.nature.com/scitable/knowledge/library/food-safety-and-food-security-68168348> (last visited Sept. 23, 2017). Economics are implicated especially in socialized economies such as China’s, where public health is subsidized and the State may also have financial stakes in food production enterprises; “soft financial constraints” and other economic pressure may even be used as an enforcement mechanism. Peng Liu, *Tracing and Periodizing China’s Food Safety Regulation: A Study on China’s Food Safety Regime Change*, 4 *REG. & GOVERNANCE* 244, 247–50 (2010).

¹⁶ Michael T. Roberts, *Role of Regulation in Minimizing Terrorist Threats Against the*

enjoy the benefits of greater popular support.¹⁷ Economically, strongly established infrastructure and trade channels better equip populaces when faced with droughts, shortages, or military needs.¹⁸ In socialized states, these goals and their benefits (and risks) are magnified: public health becomes not just a consideration of the government, but a consideration of primarily, or even solely, the government. Similarly, although other government types feel pressure to establish economic efficiency, socialized states need to incorporate and perfect such efficiency to ensure their own budget goals are met.

B. History of Food Safety in China

China's history with food law stretches back thousands of years.¹⁹ Ancient texts highlighted food safety perhaps as early as the 10th century BC.²⁰ *I Ching*, a "classic" text of major historical importance, states that through "firm correctness" in the preparation of food, good luck will be preserved.²¹ Confucius set special diet restrictions during purification periods, which included refusing to eat rancid fish, spoiled meat, anything looking or smelling bad, out-of-season food, and the like.²² The Tang Dynasty (7th to 10th centuries AD) saw refrigeration,

Food Supply: Information, Incentives, and Penalties, 8 MINN. J.L. SCI. & TECH. 199, 200 (2007).

¹⁷ See Anna Lora-Wainwright, *Dying for Development: Pollution, Illness and the Limits of Citizens' Agency in China*, 214 CHINA Q. 243, 245 (2013) ("It is not only physical health that is affected but also the texture of communities and relations between individuals, communities and the state. . . . [it] is not solely an economic question over where resources to mitigate these [pollution-related] risks should be drawn from, but also a deeply moral question." Further, highlighting the deep political connection between moral responsibility and sovereign authority, "[i]f state agents are perceived to be responsible for reducing pollution and yet are unresponsive or ineffective at doing so, citizens' trust in the state and its legitimacy may be severely threatened.").

¹⁸ See Timothy McDaniels et al., *Fostering Resilience to Extreme Events Within Infrastructure Systems: Characterizing Decision Contexts for Mitigation and Adaptation*, 18 GLOBAL ENV'T'L CHANGE 310, 310–11 (2008).

¹⁹ See, e.g., Yangyao Yu & Yuan Liu, *Development of Food Law in China* 4–6 (Mich. St. Univ. Inst. for Food L. & Reg. 2016) (unpublished lecture material) (on file with author).

²⁰ See MICHAEL NYLAN, *FIVE CONFUCIAN CLASSICS* 218 (2001) (noting that "[s]ome modern scholars" believe the text may have existed that early as a collaborative work, but that "it was [not] stabilized [until] the first or second century AD."); see also RICHARD J. SMITH, *THE I CHING: A BIOGRAPHY* 4 (2012) ("The *Changes* [or *I Ching*] first took shape about three thousand years ago . . .").

²¹ *Jia Ren*, CHINESE TEXT PROJECT 6 (James Legge trans.), <http://ctext.org/book-of-changes/jia-ren> (last visited Sept. 8, 2017).

²² CONFUCIUS, *ANALECTS* 98 (David Hinton trans. 2014). Confucius seems to have been especially picky about meats—in addition to avoiding rancid meats, he also limited his intake,

salting, brining, pickling, and even jerky-making.²³ The Song Dynasty (10th to 13th centuries AD) encouraged the avoidance of fly-contaminated food and recommended boiling water.²⁴ Food safety measures continued to appear in various instances up until the fall of the Republic of China in 1949.²⁵

Although food safety regulation might be understood in a more contemporary context, the story of China's food regulation begins its modern journey in 1949.²⁶ The development of China's food safety laws and regulations has been evolutionary, with many steps along the way.²⁷ For convenience's sake though, it may be best to break China's regulatory development in this area into distinct periods.²⁸ For instance, Peng Liu breaks these into three "regimes" since the revolution in 1949: a command regime (1949–1978), an intermediate regime of mixed instruments (1979–1992), and a new regime of regulatory governance (1993–ongoing).²⁹ Linhai Wu and Dian Zhu prefer to discuss each major enactment of legislation or regulation as a period unto itself.³⁰ Still, others use events like the Korean War,³¹ Cultural Revolution,³² economic reforms of the late 1970s,³³ and the shift to much more detailed regulatory language in 1995³⁴ as markers. A brief history of this

refused meat from markets, and, after state sacrifices, would not keep meat overnight. Even at home for family sacrifices, he would not keep meat for more than three days. *Id.*

²³ CHARLES D. BENN, CHINA'S GOLDEN AGE: EVERYDAY LIFE IN THE TANG DYNASTY 126–28 (2002). Benn describes imperial ice pits, but also states that poor farmers without access to ice could preserve fruits and vegetables for use throughout the winter season by digging trenches or creating underground storage units. *Id.*

²⁴ Yu & Liu, *supra* note 19, at 6.

²⁵ *Id.*

²⁶ ZHOU, *supra* note 2, at 71 (describing the beginning of food safety regulation in the People's Republic of China).

²⁷ See LINHAI WU & DIAN ZHU, FOOD SAFETY IN CHINA: A COMPREHENSIVE REVIEW 170 (2015).

²⁸ See, e.g., Peng Liu, *supra* note 15, at 246. For examples of other periodization schemes, see WU & ZHU, *supra* note 27, at 170–72; Yu & Liu, *supra* note 19, at 4–9.

²⁹ Peng Liu, *supra* note 15, at 244, 247, 249, 252 (a summary appears in Liu's abstract and regime headings appear on following pages; note that summary dates and heading dates are not exact, but are reasonably close).

³⁰ WU & ZHU, *supra* note 27, at 170–72.

³¹ Chenglin Liu, *The Obstacles of Outsourcing Imported Food Safety to China*, 43 CORNELL INT'L L.J. 249, 281 (2010).

³² Michael T. Roberts, *Introduction to Food Law in the People's Republic of China*, NAT'L AGRIC. L. CTR. 4 (Nov. 2007), <http://nationalaglawcenter.org/publication/view/roberts-introduction-to-food-law-in-the-peoples-republic-of-china-national-aglaw-center-publications-11-2007/>.

³³ *Id.*

³⁴ Chenglin Liu, *supra* note 31, at 283.

development follows below in three historical periods (1949–1977, 1978–1992, and 1993–2015), taking into account broad commonalities between these varied approaches. The implementation of a new Food Safety Law in 2015³⁵ begins a new area in Chinese food safety regulation.

1. 1949–1977: From Revolution to Economic Reform

In 1949, the People’s Republic of China was founded as Communist authorities consolidated power at the end of a civil war.³⁶ Early in this political shift, the population soared and starvation was a real concern; the focus of the Chinese government in food issues was one of quantity.³⁷ Most food safety incidents were poisonings from the consumption of unsafe food (likely due to hygiene issues) because of scarcity in the food supply.³⁸

Early food safety regulation was modeled after Soviet Union systems.³⁹ Rudimentary agencies were defined and given tasks—including food hygiene—through a special regulation in 1954, and by 1956, agency stations were present nation-wide.⁴⁰ A more developed regulatory framework was in place by 1959.⁴¹ Though formal regulations beyond the tasks of early agencies were sparse (and food hygiene was only a minor function),⁴² enforcing standards was not impossible; tainted meat sold to Chinese troops in the Korean War resulted in the execution of factory owners involved, sending a “powerful message” to food producers.⁴³

In 1956, the Chinese government, in an effort to moderate rapidly changing political and economic circumstances, decentralized control

³⁵ USDA FOREIGN AGRIC. SERV., GAIN REP. NO. CH15016, CHINA’S FOOD SAFETY LAW (2015) (May 18, 2015), http://gain.fas.usda.gov/Recent%20GAIN%20Publications/Aimed%20Food%20Safety%20Law%20of%20China_Beijing_China%20-%20Peoples%20Republic%20of_5-18-2015.pdf [hereinafter USDA REP.].

³⁶ Roberts, *supra* note 32, at 4.

³⁷ WU & ZHU, *supra* note 27, at 170.

³⁸ *Id.*

³⁹ Peng Liu, *supra* note 15, at 247 (discussing *Weisheng Fanghi Zhan*, sanitation stations that had sections for food hygiene and their *de facto*, “primitive administrative network”); see also Roberts, *supra* note 32, at 4.

⁴⁰ See Peng Liu, *supra* note 15, at 247 (“[Stations] had been established in all prefectures and counties of China’s 29 provincial regions.”).

⁴¹ *Id.*

⁴² See *id.* (noting that only 14 tasks were regulated by early agencies, and food hygiene was one of the minor health inspection and supervisory functions).

⁴³ Chenglin Liu, *supra* note 31, at 281–82.

over economic planning.⁴⁴ This move increased pressure on agriculture through a reduction in labor and available land, and contributed to China's devolution into the Great Leap Forward.⁴⁵ A massive famine ensued, killing tens of millions of people.⁴⁶ In 1965, several ministerial bodies in China collaborated to create the *Administrative Regulations on Food Hygiene for Trial Implementation*.⁴⁷ This was the first regulation dealing with food hygiene after the Chinese Revolution.⁴⁸ Its implementation marked the first formal effort at regulating food hygiene and helped to transition private food factories to state control, maintaining tight tolerances for safety despite low productivity.⁴⁹ Enforcement was flexible, however, as China had not forgotten about its recent famine.⁵⁰ China's Cultural Revolution, beginning in 1967, resulted in the abrogation or suspension of existing law and efforts to reform it were abandoned;⁵¹ economically, however, agricultural production was not disrupted.⁵² A working—if inadequately productive—system was in place. Regulations specifically regarding food content or production safety would not appear for several years, as tight state control left poor consumption habits as the main reason for food safety incidents in the following decade.⁵³

This early period saw the Chinese government dealing with the repercussions of major political and economic change, and food supply frequently took priority over hygiene or safety from a regulatory standpoint.⁵⁴ As external pressures began to stabilize, China saw the implementation of its earliest formal food safety regulations.⁵⁵ A new period approached, however, and it would help bring to light the need for food safety regulation as a consolidated enterprise.

⁴⁴ MICHEL AGLIETTA & GUO BAI, CHINA'S DEVELOPMENT: CAPITALISM AND EMPIRE 55 (2013).

⁴⁵ *Id.*

⁴⁶ *Id.*; Hon-Ming Lam et al., *Food Supply and Food Safety Issues in China*, 381 LANCET 2044, 2044 (2013); Chenglin Liu, *supra* note 31, at 282.

⁴⁷ WU & ZHU, *supra* note 27, at 170.

⁴⁸ *Id.*; *see also* Chenglin Liu, *supra* note 31, at 282.

⁴⁹ Chenglin Liu, *supra* note 31, at 282; *see also* WU & ZHU, *supra* note 27, at 170.

⁵⁰ *See* Chenglin Liu, *supra* note 31, at 282 (stating that “[the first regulation] did not set forth requirements for food content because China was still recovering from a catastrophic famine”).

⁵¹ Roberts, *supra* note 32, at 4; AGLIETTA & BAI, *supra* note 44, at 56 (for date information).

⁵² AGLIETTA & BAI, *supra* note 44, at 56.

⁵³ Peng Liu, *supra* note 15, at 248–49.

⁵⁴ WU & ZHU, *supra* note 27, at 170.

⁵⁵ *Id.*

2. 1978–1992: Economic Reform to Regulatory Consolidation

China's food supply issues did not disappear with the end of its famine in 1961, nor did they end after the Cultural Revolution.⁵⁶ Instead, they would continue until economic reforms were implemented in the late 1970s.⁵⁷ Mao Tse Tong died in 1976⁵⁸ and, in 1978, China instituted reformed economic policies that would lead to rapid growth in its food industry.⁵⁹ In addition to production growth and ownership diversification, China also saw an increase in the number of restaurants.⁶⁰ In the midst of this growth, the existing food safety regime and its agencies grew less effective as its bureaucratic structure failed to keep pace with a growing and diversifying industry.⁶¹

The existing food safety regime's waning effectiveness resulted in an increase in food safety incidents throughout the early 1980s.⁶² As a result, China passed the Food Sanitation Law in 1982, which took provisional effect in 1983.⁶³ This law had a wider scope than the 1965 regulation and included standards regarding food content and additives, among others.⁶⁴ Although subject to "shortcomings and limitations" regarding regulatory power, messy enforcement across disparate agencies, and economic pressures,⁶⁵ this transitional period saw an early model of testing and updating food safety regulation in anticipation of Chinese economic growth both domestically and internationally.⁶⁶

⁵⁶ Loren Brandt & Thomas G. Rawski, *China's Great Economic Transformation*, in CHINA'S GREAT ECONOMIC TRANSFORMATION 5 (Loren Brandt & Thomas G. Rawski eds., 2008).

⁵⁷ See *id.* ("[A]verage rural diets continued to fall short of basic nutrition standards. . . . food supplies for millions of Chinese villagers were no better in the 1970s than in the 1930s.") (citation omitted).

⁵⁸ AGLIETTA & BAI, *supra* note 44, at 56.

⁵⁹ Peng Liu, *supra* note 15, at 249 (noting an average annual growth of 9.3% in China's food industry gross product between 1979 and 1984); see also Brandt & Rawski, *supra* note 56, at 8 ("Everyone recognized the death of Mao [Tse Tong] in 1976 as a major turning point for the People's Republic.").

⁶⁰ Peng Liu, *supra* note 15, at 250.

⁶¹ See *id.* (describing the shift from a State-owned food industry to a "diverse ownership structure" during period of economic reform, causing the structure to become "steadily weaker").

⁶² *Id.*

⁶³ *Id.*; WU & ZHU, *supra* note 27, at 170–71 (using the term "Food Hygiene Law," though other sources refer to it as the "Food Sanitation Law").

⁶⁴ Chenglin Liu, *supra* note 31, at 282.

⁶⁵ Peng Liu, *supra* note 15, at 251.

⁶⁶ See, e.g., *id.* at 249–52 (noting that the Food Sanitation Law, or Food Hygiene Law, was passed during a time of transition and economic reform, which prompted the utilization of new policy methods, such as the creation of a national food hygiene regulation system).

3. 1993–2015: Regulation of a Single but Segmented Industry

A further update to the regulation of food safety came in 1995, when the Food Sanitation Law designated a new enforcement agency, the Ministry of Health, and led to the implementation of over 500 rules and regulations.⁶⁷ This new law was the culmination of several efforts. First, food industry enterprises grew significantly in the decade after the implementation of the Food Sanitation Law in 1983 and were increasingly independent from government ownership or control.⁶⁸ Second, the Chinese government proposed the establishment of a market economy in 1992, which also included institutional reform.⁶⁹ As a result, these institutional reforms eliminated several of the industrial ministries that had maintained control over some aspect of food safety regulation dating back to the 1950s.⁷⁰

This elimination of (some) industrial ministries forced the centralization of regulatory power in a market that had shifted towards a decentralized group of producers.⁷¹ Put another way, where many State-owned producers were previously regulated by respective industrial ministries or similar entities, the new paradigm revolved around a wide array of private producers that could be regulated by a central, “third-party” governmental authority.⁷² There were a few adjustments made in the following years, but they did not demonstrate any major shifts in policy.⁷³ The adjustments did, however, begin to segment the regulatory system by focusing certain departments’ supervision on particular stages of food production, like agricultural production, industrial food processing, food circulation, and food consumption.⁷⁴

The 1995 law started to show its limitations in the new segmented regime in the wake of a high-profile scandal in the early 2000s.⁷⁵

⁶⁷ Chenglin Liu, *supra* note 31, at 283.

⁶⁸ WU & ZHU, *supra* note 27, at 171 (using the term “Food Hygiene Law,” though other sources refer to it as the “Food Sanitation Law”).

⁶⁹ *Id.*

⁷⁰ See Peng Liu, *supra* note 15, at 252.

⁷¹ See *id.* (describing centralized government regulation reforms of food industries that had been previously decentralized and governed by local authorities).

⁷² *Id.*

⁷³ See WU & ZHU, *supra* note 27, at 171 (describing institutional reforms in 1998 and 2003 that adjusted administrative responsibilities in several ways).

⁷⁴ *Id.* at 171–72.

⁷⁵ See *id.* at 171 (discussing the milk powder scandal in Fuyang, Anhui); see also Peng Liu, *supra* note 15, at 253 (“The milk powder scandal in Fuyang, Anhui in 2003 and 2004 showed that major problems remained in China’s food safety regime.”).

Following lengthy deliberations,⁷⁶ but likely hastened by another major milk scandal in 2008,⁷⁷ the Food Safety Law of 2009 was a much broader and more detailed attempt at food safety regulation.⁷⁸ It invoked the many levels of Chinese government, from the township, up to the central government in Beijing, and included expanded standards and enforcement mechanisms.⁷⁹

C. Current Regulations and their Effectiveness

China's food safety laws, despite their rapid development and strong mandates, are imperfect. Several major scandals have hit Chinese food producers in recent years, including problems with adulterated food, counterfeit food and drugs, and contaminated food. The following two examples help to illustrate a major issue.

In 2008, Chinese-manufactured baby formula was contaminated with melamine.⁸⁰ Several babies died and nearly three hundred thousand were sickened by the tainted milk.⁸¹ The baby formula, according to the World Health Organization, was diluted to save on cost and then adulterated with melamine to appear protein-rich enough to pass quality control checks.⁸²

Another major scandal involved the sale of contaminated strawberries to schoolchildren. This scandal resulted in the sickening of over eleven thousand children in Germany in 2012.⁸³ In this case, a catering firm supplied food made from a batch of the frozen fruit that

⁷⁶ Peng Liu, *supra* note 15, at 253.

⁷⁷ Chenglin Liu, *supra* note 31, at 283 (referring to a 2008 melamine-tainted milk scandal discussed *infra* Part II(C)).

⁷⁸ See *id.* at 283–85 (describing China's hierarchical government and the role local and national government play in food safety regulation); see also Austin Ramzy, *Will China's New Food-Safety Laws Work?*, TIME (Mar. 3 2009), <http://content.time.com/time/world/article/0,8599,1882711,00.html>.

⁷⁹ Chenglin Liu, *supra* note 31, at 284–89.

⁸⁰ Tania Branigan, *Chinese Figures Show Fivefold Rise in Babies Sick from Contaminated Milk*, GUARDIAN (Dec. 2, 2008, 5:44 PM), <https://www.theguardian.com/world/2008/dec/02/china>; Michael T. Roberts, *A Perspective on Emerging Law, Consumer Trust and Social Responsibility in China's Food Sector: The "Bleaching" Case Study*, 66 FOOD & DRUG L.J. 405, 407 (2011); Chenglin Liu, *Profits Above the Law: China's Melamine Tainted Milk Incident*, 79 MISS. L.J. 371, 371 (2009).

⁸¹ Branigan, *supra* note 80; Chenglin Liu, *supra* note 80, at 372.

⁸² Chenglin Liu, *supra* note 80, at 371–72.

⁸³ Michelle Martin & Thomas Seythal, *11,000 German Schoolchildren Probably Laid Low by Strawberries*, REUTERS (Oct. 5, 2012, 6:18 PM), <http://www.reuters.com/article/us-germany-illness-idUSBRE8941HG20121005>.

was contaminated with norovirus.⁸⁴

What these scandals (and many others) have in common is that they occurred in settings involving commercialized food. The formula in 2008 and the strawberries in 2012 were food products manufactured (grown, processed, etc.) for commercial sale to domestic and international food consumers. Chinese food regulation is focused very heavily on alleviating consumer concerns through addressing the production and distribution of commercialized food directly.⁸⁵ Food grown in gardens or otherwise at home, however, is not and has not been the focus of food regulation in China. Instead, consumers of home-grown food are at the mercy of their own production or cultivation techniques and the limits and dangers of the natural resources they have at their disposal.

III. CHINESE INDUSTRIALIZATION AND ENVIRONMENTAL PROTECTION

A. *History of Industrialization in China*

Like its development in food safety, China's industrialization is readily understood to have come in periods or steps.⁸⁶ Though the histories of food safety and industrialization are interesting to explore independently, they are tightly intertwined.⁸⁷ Early modes of food regulation implicated light industry, and the political and economic pressures to build industry had effects on food safety regulation.⁸⁸ Recognizing the interplay between food regulation and industry is

⁸⁴ *Id.*

⁸⁵ See Roberts, *supra* note 80, at 407–08 (discussing the Food Safety Law's aim to build trust between government and consumers, especially by enabling anyone to report and act during production and trade that violates the law).

⁸⁶ See, e.g., Xu Nan, *A Decade of Food Safety in China*, in *FOOD SAFETY IN CHINA 1* (Zhou Wei ed., 2012) (“Researchers tend to divide China's food-safety history since 1949 into four stages.”).

⁸⁷ For instance, the Provisional Food Hygiene Control Ordinance utilized a control regime that was shared by the industrial ministries and health agencies. Peng Liu, *supra* note 15, at 249; see also AGLIETTA & BAI, *supra* note 44, at 56 (discussing the interaction between industrial and agricultural growth).

⁸⁸ See Peng Liu, *supra* note 15, at 247 (detailing light industry sectors and ministries that regulated aspects of food safety); see also AGLIETTA & BAI, *supra* note 44, at 55–56 (“[R]ural communes were restructured on smaller groups of households and inefficient rural factories were cut back. Meanwhile, industrialization was focused on the creation of an industrial base in inland provinces for military reasons.”); CHRIS BRAMALL, *THE INDUSTRIALIZATION OF RURAL CHINA 10* (2007) (“[F]rom a purely military point of view, it was essential to develop a new industrial base capable of meeting China's defence and other economic requirements in the [chiefly agricultural and pre-industrialized] hinterland.”).

crucial to understanding how volatility in one can alter the effects of the other on populations.⁸⁹

After an initial expectation of slow development, China began to speed up the transition to a completely socialist economy following its involvement in the Korean War.⁹⁰ By 1956, additional policy changes resulted in “full nationalization of private businesses.”⁹¹ This approach treated agriculture and industry differently⁹² and created a long-lasting tension between the two.⁹³ By 1958, an attempt to moderate dramatic and unsteady growth resulted in the Great Leap Forward; in this period the move to industrialize rural areas had massive negative effects on the food supply.⁹⁴ By 1960, starvation was a major issue and famine remained until 1962.⁹⁵ Despite agricultural limitations, a move towards industrialization continued, especially in rural areas, which continued to serve both the modernization of agricultural sectors of the economy and the widespread rooting of industrialized areas for defense purposes.⁹⁶ The Cultural Revolution began in 1967 and slowed this industrial push, but tensions between agricultural growth and industrialization resurfaced by its end in 1969.⁹⁷

These tensions contributed to political struggles in China until Mao Tse Tong’s death in 1976.⁹⁸ Shortly after, China’s 1978 economic reforms ushered in a new period of growth.⁹⁹ China’s rapid

⁸⁹ See, e.g., Xizhe Peng, *Demographic Consequences of the Great Leap Forward*, 13 *POPULATION & DEV. REV.* 639, 639 (1987) (“Heavy industry, especially steel production, was accorded high priority at the expense of agriculture and light industry. . . . Millions of peasant laborers moved into cities to work in factories. In the countryside the formation of people’s communes was praised as a ‘golden bridge’ toward communist society. Unfortunately, nothing worked as expected.”).

⁹⁰ See AGLIETTA & BAI, *supra* note 44, at 54 (explaining that China’s difficulty in establishing a currency caused the Communist Party to anticipate a slow transition to Soviet-style industrial planning).

⁹¹ *Id.*

⁹² *Id.*

⁹³ *Id.* at 55 (“[D]ecentralization of planning rights facilitated irrational investments which dramatized the stresses between agriculture and industry.”); AGLIETTA & BAI, *supra* note 44, at 56 (“Industrial growth was much too fast for the rigid capacity of food supply.”).

⁹⁴ See *id.* at 55 (describing the Great Leap Forward as “one of the most catastrophic experiences ever”); see also *supra* notes 44–47 and accompanying text.

⁹⁵ AGLIETTA & BAI, *supra* note 44, at 55.

⁹⁶ See *id.* at 56; see also BRAMALL, *supra* note 88, at 9–11.

⁹⁷ AGLIETTA & BAI, *supra* note 44, at 56 (“After [the Cultural Revolution’s] end in 1969, the imbalance between industrial and agricultural growth re-emerged.”).

⁹⁸ *Id.*

⁹⁹ See *id.* (“Although Mao’s era was often used to contrast with the reforms after 1978, it actually laid down crucial foundations for the later dazzling economic performance.”).

industrialization and its tensions with food safety began to show visible effects on population demographics: China's economic development from the late 1970s forward has increased both wealth and poverty simultaneously.¹⁰⁰ As a result, significant portions of the Chinese population have been both economically and politically marginalized.¹⁰¹ This marginalized population, as will be demonstrated in Part III(B), is the group that suffers from incomplete food safety regulation in China's current system.

B. Urbanization and the Bifurcation of Chinese Demographics

Industrialization's major role in China's economic expansion has had significant effects on the use of land.¹⁰² Mostly in the form of commodification through urbanization,¹⁰³ land is being increasingly utilized by "capital-intensive" enterprises¹⁰⁴ instead of the collectives and individuals¹⁰⁵ that farmed them in the past. Farmers till dwindling acreage¹⁰⁶ due to a lack of off-farm employment activities.¹⁰⁷ Additionally, growing farming enterprises are designed to feed urban populations; related policy-driven land commodification serves to improve agricultural efficiency at the expense of reduced food self-sufficiency.¹⁰⁸ In short, rural farmers are surviving on less and less.

"[M]ultiple bifurcations of policy"¹⁰⁹ have resulted in the economic

¹⁰⁰ ZHAOHUI HONG, *THE PRICE OF CHINA'S ECONOMIC DEVELOPMENT: POWER, CAPITAL, AND THE POVERTY OF RIGHTS* 89 (2015).

¹⁰¹ *Id.*

¹⁰² See Qingshui Lu et al., *Effects of Urbanization and Industrialization on Agricultural Land Use in Shandong Peninsula of China*, 11 *ECOLOGICAL INDICATORS* 1710, 1710 (2011); see Giuseppina Siciliano, *Urbanization Strategies, Rural Development and Land Use Changes in China: A Multiple-Level Integrated Assessment*, 29 *LAND USE POL'Y* 165, 165–66 (2012).

¹⁰³ See Siciliano, *supra* note 102, at 167 ("This process of urbanization of populations . . . is closely linked to a commodification of the land resource.").

¹⁰⁴ *Id.*

¹⁰⁵ See Lu et al., *supra* note 102, at 1710.

¹⁰⁶ Veronika Prändl-Zika, *From Subsistence Farming Towards a Multifunctional Agriculture: Sustainability in the Chinese Rural Reality*, 87 *J. ENVTL. MGMT.* 236, 237 (2008); see also Hong Yang & Xiubin Li, *Cultivated Land and Food Supply in China*, 17 *LAND USE POL'Y* 73, 73 (2000) (stating that from 1978–1996, total cultivated land in China has diminished by 4.73 million hectares).

¹⁰⁷ Ying Liu et al., *The Bittersweet Fruits of Industrialization in Rural China: The Cost of Environment and the Benefit from Off-Farm Employment*, 38 *CHINA ECON. REV.* 1, 7–8 (2016).

¹⁰⁸ Siciliano, *supra* note 102, at 176.

¹⁰⁹ AGLIETTA & BAI, *supra* note 44, at 54.

division of China's urban-rural population. As its economy develops and its agricultural policies reduce farmers' resources, China faces increasing gaps in income between urban and rural populations.¹¹⁰ While the Chinese's government's priority is to reduce income gaps, the current situation remains one of inequality.¹¹¹ As a result, rural populations continue to rely on very small-scale farming without the option to improve personal economic conditions, unless they move to towns or cities.¹¹² Historically treated as low-status, industrialization has impacted these rural populations more negatively than it has impacted urban residents.¹¹³ These populations have limited economic and political power¹¹⁴ and, therefore, suffer the effects of policies that cannot be enforced completely across populations and geographical areas.¹¹⁵

C. Environmental Quality Problems and their Effects on Food Supply

China has been home to rapid industrialization, urbanization, and economic growth for several decades, and environmental quality problems have grown as well.¹¹⁶ The relationship between environmental regulation and industry growth has been a popular academic focus.¹¹⁷ In this specific context, differing relationships have been hypothesized: either lax environmental regulation has played a part in this growth,¹¹⁸ or exploding pollution in air, water, and on land has

¹¹⁰ Siciliano, *supra* note 102, at 167.

¹¹¹ *See id.* (detailing income discrepancies and discussing the potential for urbanization to reduce income gaps); Prändl-Zika, *supra* note 106, at 236–37 (noting that rural incomes and living standards “[lag] far behind the prosperous development in the cities and coastal areas” and are at “somewhat above subsistence level”).

¹¹² Prändl-Zika, *supra* note 106, at 237.

¹¹³ Liu et al., *supra* note 107, at 8.

¹¹⁴ Craig G. Smith, *Chinese Farmers Rebel Against Bureaucracy*, N.Y. TIMES (Sept. 17, 2000), <http://www.nytimes.com/2000/09/17/world/chinese-farmers-rebel-against-bureaucracy.html>; *see also* HONG, *supra* note 100, at 108 (describing “Chinese farmers’ lack of rights to landed property” and the fact that they “have little or no say in the decision-making process [regarding property]”).

¹¹⁵ *See* Liu et al., *supra* note 107, at 1–2 (outlining asymmetrical policymaking, enforcement, and monitoring of environmental issues between urban and rural areas).

¹¹⁶ *See supra* Parts III(A) and III(B).

¹¹⁷ For example, Wang and Shen discuss the “Porter Hypothesis,” which states that properly written and enforced regulations could benefit both the environment and private industry. This, they note, is counter to a more popular understanding that regulations have a negative impact on industry growth. Yan Wang & Neng Shen, *Environmental Regulation and Environmental Productivity: The Case of China*, 62 RENEWABLE & SUSTAINABLE ENERGY REV. 758, 759 (2016).

¹¹⁸ *See, e.g.*, Hua Wang et al., *Environmental Protection in China*, in POLLUTION IN CHINA 1 (Michael I. Chang ed., 2011).

been a result of it.¹¹⁹ Some have also pointed to corruption as a negative contributor to the state of Chinese environmental regulation.¹²⁰ In any case, China faces major environmental issues in the midst of its industrial and urban development.

While China's economy has developed over the last thirty years, its growth has contributed to a concerning deterioration in environmental conditions.¹²¹ It has been stated that "the foundations of effective environmental protection are a country's legal regime and its implementation."¹²² Other pressures from China's massive economic transition, however, have produced mixed results as growth has created new environmental stresses and reduced regulatory capacity.¹²³

Water quality has deteriorated for decades as rapid economic growth polluted water sources.¹²⁴ Soil has been polluted by industrial waste, agrochemicals, sewage, and polluted water.¹²⁵ Heavy metals pollute nearly one-sixth of the cultivated land mass in China; areas on the outskirts of cities see cadmium, mercury, arsenic, copper, lead, nickel, and chromium soil contamination.¹²⁶ Urban industrial waste plays a major role,¹²⁷ but pesticide application also contributes.¹²⁸ Major enterprises or industries are not the sole introducers of pollution: even if given safety instructions with agricultural-use chemicals, farmers may be unable to read them.¹²⁹

These environmental hazards strongly manifest in urban-rural

¹¹⁹ See, e.g., Wenfeng Mao & Shujuan Zhang, *Impacts of the Economic Transition on Environmental Regulation in China*, 5 J. ENVTL. ASSESSMENT POL'Y & MGMT. 183, 183–84 (2003) (discussing how economic growth, amongst other factors, have created new "environmental stresses").

¹²⁰ Ying Huang & Lei Liu, *Fighting Corruption: A Long-Standing Challenge for Environmental Regulation in China*, 12 ENVTL. DEV. 47, 47 (2014).

¹²¹ Wang et al., *supra* note 118, at 1.

¹²² Margherita Poto, *Environmental Regulation in China through the Lens of the European Model*, 18 ASIA PAC. J. ENVTL. L. 69, 73 (2016).

¹²³ Mao & Zhang, *supra* note 119, at 183–84.

¹²⁴ Wang et al., *supra* note 118, at 4.

¹²⁵ Jie Chen, *Rapid Urbanization in China: A Real Challenge to Soil Protection and Food Security*, 69 CATENA 1, 9 (2007).

¹²⁶ *Id.*

¹²⁷ See *id.* ("Reportedly, soil pollution associated with urban and industrial sources accounts for one-third to half of the total polluted arable area in the country, with a concentrated distribution in the peri-urban zones.")

¹²⁸ See *id.* ("Besides heavy metals, 15 kinds of polychlorinated biphenyls (PCBS) [which can be used as pesticide extenders] and organochlorine pesticides were detected in all of the tested paddy soils.")

¹²⁹ Prändl-Zika, *supra* note 106, at 238.

inequalities.¹³⁰ The exact incidence of this is undetermined; it is often assumed that health risks related to pollution fall disproportionately on the poor, but in China this is yet to be formally studied across population groups.¹³¹ A lack of options and resources does put the poor at risk of health problems generally, though problems specifically related to pollution fall into a much more complex set of circumstances.¹³² Still, there is evidence that rural residents are the ones suffering more.¹³³ Geography matters.¹³⁴ Additionally, the difference in stringency of environmental policies between rural areas and urban areas plays a role.¹³⁵ Furthermore, low population density and insufficient monitoring in rural areas are also contributing factors.¹³⁶

This increased rural exposure to pollution causes negative health effects by finding its way through the food supply. “As a country undergoing rapid changes in economic, social, cultural and political life, and with people in rural and urban areas in different parts of the country living and working in vastly different physical and social conditions, China faces a particularly complicated set of environment and health challenges.”¹³⁷ Despite strong efforts and continual improvement, “environmental deteriorations have caused significant damages to [China’s] economy and its socio-welfare,” including the health of rural populations.¹³⁸

Returning to the goals of a food safety regime, the three pillars are each threatened by this environmental situation in China. Soil pollution has been a concern for food quality safety.¹³⁹ Water is undrinkable in

¹³⁰ Liu et al., *supra* note 107, at 1 (“In general, rural residents . . . have been found to suffer more environmental pollution from industry after controlling for other socioeconomic factors.”).

¹³¹ See Jennifer Holdaway, *Environment and Health Research in China: The State of the Field*, 214 CHINA Q. 255, 269 (2013); see also Liu et al., *supra* note 107, at 2–3 (stating that environmental inequality findings are “mixed”).

¹³² Holdaway, *supra* note 131, at 270.

¹³³ See, e.g., Chunbo Ma, *Who Bears the Environmental Burden in China—An Analysis of the Distribution of Industrial Pollution Sources?*, 69 ECOLOGICAL ECON. 1869, 1874 (2010) (stating that “townships with a higher proportion of rural migrant residents are more likely to have a higher exposure to environmental pollution” and “rural townships and residents suffer more from pollution”).

¹³⁴ Liu et al., *supra* note 107, at 3.

¹³⁵ Ma, *supra* note 133, at 1874.

¹³⁶ Liu et al., *supra* note 107, at 2.

¹³⁷ Holdaway, *supra* note 131, at 256–57.

¹³⁸ Wang et al., *supra* note 118, at 3.

¹³⁹ Chen, *supra* note 125, at 9. Chen states, “soil not only functions as an indispensable physical base to provide humankind a majority of food, livestock feed, fibre and biotic fuel, but serves as both a source and a sink for green house gases and an integrated part of

many areas, but continues to be used for irrigation.¹⁴⁰ Air pollution and overuse of agricultural chemicals are negatively affecting arable land.¹⁴¹ All of these pollutants make their way into the food supply, increasing health risks from eating contaminated food.

Food security is at risk due to lacking environmental regulation. Arable land is being reduced, threatening supply.¹⁴² Pollution from the deposit of acid rain is accelerating soil degradation, depleting nutrients, and heightening the bioavailability of heavy metals,¹⁴³ jeopardizing yield and raising contamination risk simultaneously. Changes in soil utilization (from subsistence grains toward the raising of animals for meat and dairy) have tended toward decreasing agricultural efficiency by increasing the production of particularly land-consuming foods¹⁴⁴ and risking future output by focusing production on particularly nutrient-hungry crops.¹⁴⁵ These factors reduce access to sustainable, natural resources that are necessary for long-term food production, and thus threaten the stability of the food supply.

Public health is directly threatened by natural resource pollution, including that in the water, soil, and air.¹⁴⁶ Indirectly, chemicals and heavy metals move through the food supply to cause sickness, injury, and worse.¹⁴⁷ Biologically contaminated water can carry disease in addition to other environmental pollutants.¹⁴⁸ Economically, this burdens

biogeochemical cycles." *Id.* at 2.

¹⁴⁰ *Id.* at 9.

¹⁴¹ *Id.*

¹⁴² Prändl-Zika, *supra* note 106, at 238; *see also* Yang & Li, *supra* note 106, at 73; *see also* Chen, *supra* note 125, at 2–4.

¹⁴³ Chen, *supra* note 125, at 10.

¹⁴⁴ Prändl-Zika, *supra* note 106, at 238 ("The consequences [of shifting from grain production toward meat and dairy production] are that more land and more energy are required for those products delivering the same nutrition energy as grain products."); Chen, *supra* note 125, at 11–12.

¹⁴⁵ Chen, *supra* note 125, at 12 ("For instance, fruits and vegetables remove considerably more nutrients from the soils than cereal grains.").

¹⁴⁶ Wang et al., *supra* note 118, at 22.

¹⁴⁷ *See, e.g.*, Mary E. Zabik, *Polychlorinated Biphenyls and Polybrominated Biphenyls in Foods*, in *THE SAFETY OF FOODS* 444 (Horace D. Graham ed., 2d ed. 1980) (discussing polychlorinated biphenyls and its ability to accumulate in food chains); *see also* Islam Ejaz ul et al., *Assessing Potential Dietary Toxicity of Heavy Metals in Selected Vegetables and Food Crops*, 8 J. ZHEJIANG U. SCI. B 1, 2 (2007) (discussing heavy metals as cumulative poisons that "have damaging effects on human beings and other animals" and are "exceptionally toxic").

¹⁴⁸ Judith Banister, *Population, Public Health and the Environment in China*, 156 *CHINA Q.* 986, 993–97 (1998).

public health resources,¹⁴⁹ it affects the desirability of Chinese-produced agricultural products abroad,¹⁵⁰ and it also reduces agricultural efficiency.¹⁵¹

China's efforts in food regulation are well-publicized in the wakes of its major food scandals.¹⁵² Chinese food regulation has in turn been treated with international respect, though support is often guarded in light of safety issues that have had international impacts.¹⁵³ Unfortunately, China's record with environmental regulations or protections is both comparatively and objectively woeful.¹⁵⁴ Under the rapidly unfolding umbrella of industrialization, China has clearly placed environmental protections on a back burner when it comes to policymaking, and this has had an indirect effect on food safety, especially among the rural poor.

IV. STATEMENT OF THE PROBLEM AND SOLUTION

The triaging of environmental regulations has negative consequences in many arenas, and food safety is one that is often overlooked.¹⁵⁵ While researchers and scholars are no strangers to the deleterious effects of contaminated environments on the safety of food cultivated in those very environments,¹⁵⁶ China's particularly rapid and thorough recent history of urbanization and industrialization have

¹⁴⁹ See Eleanor Albert & Beina Xu, *China's Environmental Crisis*, COUNCIL ON FOREIGN RELATIONS (Jan. 18, 2016), <http://www.cfr.org/china/chinas-environmental-crisis/p12608> ("Environmental depredations pose a serious threat to China's economic growth, costing the country roughly 3 to 10 percent of its gross national income. . . ."); see, e.g., WORLD BANK & STATE ENVIRONMENTAL PROTECTION ADMINISTRATION, P. R. CHINA, *COST OF POLLUTION IN CHINA: ECONOMIC ESTIMATES OF PHYSICAL DAMAGES* 19 (2007) (suggesting that urban air pollution results in public health and economic harm).

¹⁵⁰ Peng Liu, *supra* note 15, at 245 ("Maintaining the reputation of 'Made in China' has . . . become a serious policy issue for Chinese leaders.").

¹⁵¹ Chen, *supra* note 125, at 9 (noting a study that found heavy metal pollution causing "an annual grain yield loss of 10 million tons").

¹⁵² See, e.g., Congressional Research Service, *China's Efforts to Address Ongoing Food Safety Concerns*, IN FOCUS (Sept. 9, 2016), <http://nationalaglawcenter.org/wp-content/uploads/assets/crs/IF10465.pdf> (discussing China's response to recent food scandals).

¹⁵³ See, e.g., *id.* (discussing Congress' concern over food safety in China despite recent efforts).

¹⁵⁴ See Wang et al., *supra* note 118, at 1 (stating that the environmental efforts in the past were insufficient and the evidence is clearly seen in the "unbearable pollution levels" and other economic and environmental concerns).

¹⁵⁵ See Junfeng Zhang et al., *Environmental Health in China: Progress Towards Clean Air and Safe Water*, 375 LANCET 1110, 1111 (2010).

¹⁵⁶ See *supra* Part III(C).

markedly marginalized the groups that would be most injured by contaminated resources and their effects on local food supply. Put more directly, China's push to industrialize has forced some of the most vulnerable populations out of the regulatory scheme designed to protect citizens. The sources of this conflict are threefold. First, China has industrialized too quickly for regulatory schemes to keep up. Second, China's environmental quality problems are persistent and directly affect the natural resources needed for food cultivation. Third, regulation has moved its focus with the bulk of the population as it has shifted toward urbanization, casting an ever-darker shadow on the likelihood of addressing environmental concerns in rural areas.

Chinese food regulation is focused heavily on the urban subset of the population to the detriment of the remainder. Those outside of the urban subset suffer not just because they fall outside of the scope of the regulations themselves, but because they are more likely to consume food from sources that are also under-regulated.¹⁵⁷ Chinese environmental regulation is proving ineffective, and many people find themselves farming on contaminated land or with contaminated water. Despite the growing strength of Chinese food safety laws and their implementation, this population still faces the risk of eating unsafe food.

The solution to this problem is to introduce or rework environmental regulations to deal directly with substances or resources in the food supply chain. Hazardous heavy metals, chemicals, and the like, which may have negative effects on the soil or water,¹⁵⁸ along with the soil and water themselves, are fertile ground for regulation that could save the lives of those who depend on their proper management.

China's 2009 Food Safety Law was written by the State Council, and it required that the Council establish a Food Safety Commission ("FSC") to oversee the administration of the law.¹⁵⁹ The FSC remains in the 2015 Food Safety Law, which brings other "health related ministries, commissions, and departments" under the umbrella of the FSC in enforcing the law¹⁶⁰ and tasks "local people's governments above the county level" with administering food safety regulations directly.¹⁶¹ This

¹⁵⁷ Banister, *supra* note 148, at 997 ("Much of China's food is grown and consumed in villages without the involvement of a market, so it is only localities and households that can prevent its contamination.").

¹⁵⁸ See *supra* Part III (C).

¹⁵⁹ Chenglin Liu, *supra* note 31, at 283–85.

¹⁶⁰ An English translation of the language of the 2015 Food Safety Law reveals this in Article 5. USDA REP., *supra* note 35, at 4.

¹⁶¹ *Id.* at 4, art. 6.

local power of administration includes the authority to determine the duties of both the Food and Drug Administration and the Health Administration in China, along with other departments at the same governmental level.¹⁶² The Ministry of Environmental Protection is, like the National Health and Family Planning Commission,¹⁶³ a cabinet-level department.¹⁶⁴

Regulating environmental pollution will protect natural resources upon which agricultural self-producers rely. Such regulation would serve to protect *both* pipelines for food in China—the commercial and the traditional. Only by protecting both pipelines can the goals of food security, food safety, and public health and economic efficiency be adequately met for all citizens, urban and rural.

V. COUNTERARGUMENTS

One major counterargument that might be raised is that China is a socialized nation with an ongoing plan to both provide for the needs of its citizens and control the means by which those citizens are supplied. Specifically, China's government has the power and intent to commercialize farming nationally and provide for every last one of its citizens through its state-controlled production and distribution channels. By doing so, the need for subsistence agriculture is eliminated along with the risks that would prompt relevant (environmental) safety regulation.

While this is a strong argument, it misses the mark in two ways. First, regardless of food supply issues, China is in desperate need of improved environmental regulation and enforcement. To tie this effort to food safety regulations (existing or future) may require only a marginal increase in cost. Just as enforcement of commercial food safety regulations has proven difficult in such a broad and diverse market, there will doubtless be some sustenance farmers that go untouched by even perfect food safety regulations. For near-zero cost, a safety net for these

¹⁶² *Id.*

¹⁶³ This is the new iteration of the Ministry of Health. See Shan Juan, *New Health Commission Set to be Established*, CHINA DAILY (last updated Mar. 11, 2013), http://usa.chinadaily.com.cn/china/2013-03/11/content_16296626.htm.

¹⁶⁴ See, e.g., *People's Republic of China Ministry of Environmental Protection*, AECEN, <http://www.aecen.org/stories/people%E2%80%99s-republic-china-ministry-environmental-protection> (last visited Sept. 21, 2017) (stating that the Ministry of Environmental Protection was “[e]stablished by the elevation of the State Environmental Protection Agency to the cabinet level in 2008”); *The Organizational Structure of the State Council*, CENT. PEOPLE'S GOV'T., <http://www.gov.cn/english/links.htm#1> (last visited Sept. 8, 2017).

citizens is difficult to argue against. Second, ubiquitous commercial farming on a large scale is a massive undertaking. It will not happen instantly, and so, even as merely a stop-gap measure, some food regulations should exist that take into account hand-to-mouth cultivators.

Another potential counterargument is that the changes necessary to accomplish integration between environmental regulation and food safety regulation are simply too great to accomplish. The two spheres are regulated by different ministries¹⁶⁵ unlikely to yield political power to one another; in reality, the FSC lacks the authority implied by the Food Safety Law,¹⁶⁶ and China has little incentive to spend limited resources on marginalized minority populations.

This counterargument also fails. While different ministries may indeed refuse to cooperate, and even if the FSC lacks authority, China is exploring other avenues to regulation that could bridge the gaps. The first is the concept of an integrated approach through social governance.¹⁶⁷ Under this concept and using this approach, China could tackle holes in food safety regulation by encouraging better practices socially; that is, by addressing some social issues, such as disparity in information access, helping outsider groups understand and accept best practices, and even simply encouraging some political involvement on a grassroots level, China can more quickly mitigate some of the issues that formal lawmaking might eventually address. As for incentives, there is a growing trend of urban agriculture migrating from the West, particularly the United States.¹⁶⁸ Succinctly put, China's urban middle and upper

¹⁶⁵ Environmental regulation is under the purview of the Ministry of Environmental Protection. *Mandates*, MINISTRY OF ENVTL. PROTECTION OF THE PEOPLE'S REPUBLIC OF CHINA, http://english.sepa.gov.cn/About_SEPA/Mandates/ (last visited Sept. 25, 2017). Food safety regulation, however, is overseen by six food safety regulators, including the Ministry of Agriculture and the National Health and Family Planning Commission, but not the Ministry of Environmental Protection. See USDA FOREIGN AGRIC. SERV., GAIN REP. NO. CH16069, FOOD AND AGRICULTURAL IMPORT REGULATIONS AND STANDARDS 7–8 (Feb. 3, 2017), http://gain.fas.usda.gov/Recent%20GAIN%20Publications/Amended%20Food%20Safety%20Law%20of%20China_Beijing_China%20-%20Peoples%20Republic%20of_5-18-2015.pdf.

¹⁶⁶ Because local governments are tasked with oversight of food safety, and rural subsistence agriculture goes largely unregulated, the FSC is unlikely to be able to control all aspects of food safety throughout China. See *supra* Parts II(C) and IV.

¹⁶⁷ See generally UCLA SCHOOL OF LAW, THE CHINA FOOD SAFETY GOVERNANCE INITIATIVE (Resnick Program for Food Law and Policy 2016); see also Yu Keping, *A Shift Towards Social Governance in China*, EAST ASIA FORUM (Sept. 9, 2011), <http://www.eastasiaforum.org/2011/09/09/a-shift-towards-social-governance-in-china/>.

¹⁶⁸ See Pinghui, *supra* note 8; see also Yan Shi et al., *Safe Food, Green Food, Good Food: Chinese Community Supported Agriculture and the Rising Middle Class*, 9 INT'L J. AGRIC. SUSTAINABILITY 551, 553 (2011).

classes are also growing their own food, and increasingly so.¹⁶⁹ Urban areas in China are frequently heavily polluted,¹⁷⁰ and so these higher, majority classes are also at risk for contamination. As such, China's incentive to regulate is larger than it may initially appear.

VI. CONCLUSION

China's food safety regulation is imperfect, suffering from occasional high-profile scandals.¹⁷¹ Food safety regulation, however, makes a positive impact on the food market, both domestically and internationally, and has been remarkably successful given its quick implementation and the sheer scale of the Chinese food market.¹⁷² China's environmental regulations are far less effective, and pollution is rampant in soil, water, and air.¹⁷³ China's rapid industrialization has lifted millions from poverty and put them under the protection of commercial food regulation, but it has simultaneously accelerated pollution of land, water, and other natural resources.¹⁷⁴ Ensuing urbanization has left many people unprotected as they remain in under-regulated rural areas.¹⁷⁵ The sheer scale of the Chinese government's focus on its urban population has left those growing their own food particularly vulnerable and marginalized, facing disproportionate risks that come from eating food grown with contaminated resources.¹⁷⁶

The solution to this problem is to introduce, rework, or find food safety applications for environmental regulations that can affect substances or resources in the food supply chain. Attention must be directed to hazardous heavy metals, chemicals, and the like that may have negative effects on or through soil, water, and air. If dealt with effectively, a harmonization between food safety regulation and environmental regulation could save many of those whose lives directly depend on natural resources for food.

¹⁶⁹ See Pinghui, *supra* note 8 (“[M]any mainlanders—frustrated about numerous food scandals that have plagued even staple elements of Chinese dinner tables . . . —are taking matters into their own hands to keep their diets safe.”).

¹⁷⁰ Hong Yang et al., *Soil Pollution: Urban Brownfields*, 344 *SCI.* 691, 691 (2014).

¹⁷¹ See *supra* Part II(C).

¹⁷² See, e.g., John Kojiro Yasuda, *Why Food Safety Fails in China: The Politics of Scale*, 223 *CHINA Q.* 745 (2015) (ascribing failures to issues of scale in Chinese food regulation).

¹⁷³ See generally, Wang et al., *supra* note 118.

¹⁷⁴ Joseph Kahn & Jim Yardley, *As China Roars, Pollution Reaches Deadly Extremes*, *N.Y. TIMES* (Aug. 26, 2007), <http://www.nytimes.com/2007/08/26/world/asia/26china.html>.

¹⁷⁵ See *supra* notes 109–115 and accompanying text.

¹⁷⁶ Liu et al., *supra* note 107, at 1–2.