



Contents

Editorial – Fireworks and The New Year’s Detox: Reflections on Chemical Intimacies at the Start of the Year	1
Translating Toxic Exposure: Taiwan RCA.....	3
The Chinese Government Should Support Small Scale Agriculture for a Green China	11
Revisiting the Air Pollution Crisis in China – a lesson on toxicity, sociality and humanity	16

Editorial – Fireworks and The New Year’s Detox: Reflections on Chemical Intimacies at the Start of the Year



Image credit: Y. Caradec – Flickr

Loretta Lou, Department of Sociology, University of Warwick

Each year, capital cities around the world welcome the New Year with spectacular fireworks displays. Although few of us would associate this annual tradition with environmental pollution, [scientists](#) have found that fireworks are responsible for high concentrations of airborne particles that are [more toxic](#) than from traffic sources. Moreover, fireworks pollution doesn’t just affect the atmosphere. As King’s College Lecturer [Gary Fuller](#) points out, ‘what goes up has to come down. Fireworks that fall to the ground contain residues of unburnt propellants and colourants, while particle pollution in the air eventually deposits on the ground or gets washed out by rain. Some of this finds its way into lakes and rivers, where percolate has been linked to thyroid problems, causing limits to be set for drinking water in some US states.’

Despite its environmental cost, fireworks pollution has attracted little media attention in the U.K. By contrast, fireworks bans have been underway in parts of the world where toxic smog is a daily struggle.

Despite its environmental cost, fireworks pollution has attracted little media attention in the U.K. By contrast, fireworks bans have been underway in parts of the world where toxic smog is a daily struggle. In Tianjin, China, [fireworks are forbidden](#) from 1 January 2018 amid China’s efforts to fight air pollution in the Beijing-Tianjin-Hebei (BTH) region.

Last year, India's Supreme Court [reinstated a ban](#) on the sale of fireworks in New Delhi and its nearby regions when air pollution reached a breaking point after the Diwali celebrations in 2016. In the tech world, growing awareness of fireworks pollution has prompted Intel to develop new technologies like the [drone light shows](#), which could be used to replace today's toxic fireworks.

While 'detoxing' fireworks may seem a strange idea for most people, many of us have heard of the idea of a 'new year's detox'—a widely marketised health ritual that claims to flush out toxins from the body through the consumption of certain foods and supplements. The underlying assumption of this marketing strategy is that our bodies can accumulate toxins from various sources on a daily basis and the New Year provides a great incentive to 'unload' such 'toxic burden'.

What I find most interesting about these two new year's rituals is the complex process in which toxins are understood and made visible by the wider public—a theme that my colleagues and I are going to explore in our upcoming workshop in May 15-16, 2018. Relevant to this is the notion of '[chemical intimacies](#)'—a theoretical and methodological framework that [Jaworski](#) uses to make sense of people's experience and narratives of chemical (in)sensitivities amid subtle 'chemical background noise' ([Shapiro 2015](#)). Research that traces chemical intimacies ask how feelings, sensations, reasoning, and relatedness figure in the process and the politics of recognising toxic exposure. How important are each of them? Although fireworks pollution is backed by a number of scientific studies, its toxic effect seems to be offset by the exhilaration that fireworks afford us. Its ephemeral nature also makes the problem appears as less serious because the pollution that fireworks generate is considered as only temporary, thus less closely related to our everyday life. In contrast, the idea that our bodies are exposed to toxins on a daily basis resonates with our common experience, even though it is unclear what these toxins are, common sense tells us that repeated exposure to poisonous substances—whether it is by ingestion or by inhalation—has far more serious consequence than temporary exposure. As these two examples make clear, what counts as an exposure and how toxins are recognized determine our actions, or lack thereof.

In our first issue in 2018, we present three articles on the experience of toxic exposure in Greater China. [Paul Jobin, Hsin-hsing Chen, and Yi-ping Lin](#) bring us a detailed report on a recent verdict on a toxic-tort class action in Taiwan, followed by a discussion of the challenges and reward of 'translating toxic exposure' as STS scholars. Next we have [Rowan Alcock](#), who argues that a new 'down to the countryside movement' might help reduce China's over-reliance on chemical fertilizer, which obviously has adverse environmental impact. Finally, [Fangfang Li](#) explores the social and cultural meanings of air pollution and calls for a social and humanitarian response.

Following the publication of our [first translation](#) in the previous issue, we are delighted to publish the Chinese translation of [Jobin, Chen, and Lin's report in this issue](#). In doing so we hope *Toxic News* would reach out to a more diverse readership in the future. Speaking of impact and outreach, I am pleased to announce that the animation about our Toxic Expertise project is now live and you can view the video via [this link](#)!



In front of the Taipei High Court, 27 October 2017. On the banners: “Another victory [for the plaintiffs]! Now pay compensation!” “Regrets” [for victims already deceased]

Translating Toxic Exposure: Taiwan RCA

Paul Jobin, Hsin-hsing Chen, Yi-ping Lin

Paul Jobin is Associate Research Fellow at the Institute of Sociology, Academia Sinica, Taiwan. jobin@sinica.edu.tw

Hsin-hsing Chen is Professor at the Graduate Institute for Social Transformation Studies of Shih-Hsin University, Taiwan. dkchen10@gmail.com

Yi-Ping Lin is Associate Professor and Chairperson of the Institute of Science, Technology and Society at National Yang Ming University, Taiwan. yplin3@ym.edu.tw

In her last [editorial](#) in Toxic News, Alice Mah raised the importance of translation in issues of environmental justice. We would like to follow on that intuition using our experience in the class action of the former workers of Taiwan RCA (Radio Corporation of America), a mobilization that started in 1998 and recently won a victory in court. As social scientists with a background in science and technology studies (STS), we have been involved with the plaintiffs and their lawyers for around a decade, gathering together different experts in the mobilization (epidemiologists, toxicologists, environmental engineers, etc.), collecting data from various countries, contributing to translation work (strictly speaking-- from English, French and Japanese to Chinese) and helping the workers to translate their experience and medical evidence into legal causation.

A Groundbreaking Verdict for the Victims of Toxic Exposure

On October 27, 2017, the Taiwan High Court handed down a landmark verdict on this toxic-tort class action opposing the former workers of Taiwan RCA—most of them women—against their employer and its parent companies. After nineteen years of collective struggle, the workers have obtained a solid and groundbreaking decision that

could set legal precedents in similar cases of toxic-torts class actions and inspire other victims of environmental injustices around the world. Several issues that hitherto prevented such victims from getting the justice they deserve are addressed, like the complex causation of chemical exposure and the “corporate veil” draped over our age of globalized capital.



The authors congratulating the plaintiffs and their lawyers, at the Taipei High Court, 27 October 2017 (from left to right: Yi-ping Lin, Hsin-hsing Chen, Paul Jobin). Photo: Jung-lung Chang

The Court found four defendant companies liable for workers’ impaired health and emotional distress caused by exposure to dozens of chemical toxicants while working at the factories of RCA Taiwan, which produced television sets for the US market from 1970 to 1992. The four companies include RCA, Taiwan and its successive parent companies, General Electric of the US and Thomson Consumer Electronics (later Technicolor SA) of France, as well as Thomson’s Bermuda subsidiary. The defendants have been ordered to pay a total sum of 718.4 million Taiwan dollars (approximately US\$ 23.7 million) in compensation to 486 of the 513 plaintiffs, all former employees of RCA Taiwan.



Joseph Lin, head of the plaintiffs group of lawyers, translating into plain Mandarin the main points of the verdict, at the Taipei High Court, 27 October 2017. Photo: Jung-lung Chang

As is common in most occupational-disease and pollution controversies, the victims in the Taiwan RCA case were exposed to a mixture of a wide range of hazardous chemicals, 31 of which are covered in the Court's decision, including substances classified by the WHO's International Agency for Research on Cancer as known human carcinogens, such as trichloroethylene and benzene. In countless toxic-tort cases, courts have adopted a "one-chemical-one-disease" view of causation, enabling companies that have unlawfully exposed people to a mix of hazardous chemicals to avoid any liability, as the causal links are so complex. In the U.S., the *Daubert* standards have made it incredibly difficult for the victims of toxic torts to prove even relatively simple causation (Jasanoff 1995, Cranor 2016). In this case, however, the Court ruled that, because RCA violated several laws and regulations at the time of its operations and failed to provide adequate protection for workers, it is responsible for the damage to their health, which has been scientifically recognized as likely caused by exposure to one or more chemicals. That damage includes cancers, miscarriages and other reproductive disorders, as well as other serious illnesses. This is a major breakthrough.



Emotion runs high when Tsu-ping Ch'in evokes her sister Tsu-hwei, who was a key member of the mobilization and who died before she could hear the verdict.

The judges of the Taiwan High Court also awarded damages to those who have not yet been diagnosed with serious health conditions, but are emotionally distressed from witnessing numerous former co-workers fall ill and die from cancer and other illnesses. The defendants argued that "mere worries" do not warrant compensation. The judges, however, rejected that claim, since plaintiffs do also suffer from elevated health risks caused by exposure to toxic chemicals. And even when exposure has not yet yielded perceptible symptoms, carcinogens, particularly the "genotoxic," start to alter genes in human cells at the time of contact. This approach hinges on a much more sophisticated scientific understanding of the various pathways and mechanisms through which toxic chemicals cause disease in humans.

A common feature of toxic-tort cases is for victims' claims against the perpetrators of industrial crime to be thrown out by the court, because the statute of limitations has passed. This happens time and again, since latency periods render the chronic diseases caused by toxic exposure hard to diagnose in a timely fashion, making it difficult for both

victims and scientific researchers to discover the collective pattern of the diseases. In contrast, in the RCA Taiwan verdict, the Court found that, because the difficulty for victims to discover the truth was, in fact, caused by the company's withholding of information, the company could not use the statute of limitations as a legitimate defense.

Another major obstacle for the victims is the well-named “corporate veil.” In 1986, GE bought RCA and its subsidiaries. Two years later, GE sold RCA to the French firm Thomson Consumer Electronics. Four years later, Thomson closed the RCA Taiwan plants, moving production to China. Thomson also sold the land and buildings of the Taiwan plants to a third party, and remitted US\$ 150 million abroad. In 1998, after RCA's persistent pollution was disclosed and the former workers realized that they were stricken with cancers, another US\$ 100 million was transferred to a French bank account. The Taiwanese judges considered these actions as constituting malicious evasion of debt and obligations by RCA and its parent companies, so that the US principle of “piercing the corporate veil” would apply in this case: GE, Technicolor, and Thomson (Bermuda) thus are *jointly and severally responsible* for the tort liability incurred by RCA on the workers. This point will surely inspire many of those struggling against similar crimes around the world, such as those who have fallen ill from exposure to Monsanto's pesticides.

The case is now pending in the Supreme Court for the five hundred plaintiffs, and another file has already started at the District Court for another group of one thousand plaintiffs. But this verdict has already paved the way for other cases in Taiwan, and could certainly inspire the mobilizations of other victims of toxic “slow violence” in other countries.



First court hearing for the second group of plaintiffs, at Taipei District Court, 21 December 2017. Photo: Jung-lung Chang

The Defendants Experts: Lost in Translation

In December 2016, at a crucial juncture during the appeal trial, RCA's lawyers called a Harvard Law professor to testify in court in Taiwan for them (in English with Chinese translation). After providing the court with theories of why RCA should be allowed to walk away, the professor stated that his rate for such service is US\$ 750 per hour. Before his work for RCA in Taiwan, the professor was paid US\$ 250,000 by British Petroleum (BP) for a 50-page report on the Deepwater Horizon oil spill, discouraging residents from suing BP for economic loss. “It is the normal rate for this kind of consultation by a law professor in the US,” he commented to the Court in Taipei. The judges and the audience were wide-eyed in amazement. This law professor is just one among many high-priced experts RCA retained from the US, China, Japan and France in their defense. Finally, on top of lawyers' fees for the long legal battle, and translation fees for those foreign experts

who could not speak Chinese, all of these high-priced experts were ultimately of no avail to the defendants.



Harvard School of Law Professor John Goldberg testifies

Was the translation defective? Indeed, although it was conducted by well-trained lawyers, sometimes important elements were lost in translation. The defendants could also recruit some Chinese or Chinese-American epidemiologists who could present their argument in plain Mandarin: a perfect rhetoric of negation, so as to minimize the effects of exposure to the toxic chemicals and the significant increase in risk cancer found by Taiwanese researchers.

So, what made the plaintiffs’ testimonies more convincing? As one of the plaintiffs’ lawyers summarized: “If you want to get the best translator for your case, go to the STS department!” This lawyer is not familiar with Latour, Callon and other ‘[sociologists of translation](#),’ but his understanding of what translating implies was largely ‘contaminated’ by his regular interaction with social scientists with a STS background.

The Plaintiffs and STS’ translating skills¹

Members of Taiwan’s STS community have played significant roles in the mobilization of the former workers both in and outside of court, and their translation skills were probably a key factor in their collaboration with workers, activists, lawyers, public-health professionals, and many volunteers students.

First of all, as suggested above, there were a lot of translations in the ordinary meaning of the word: from English—as well as from Japanese and French—into Chinese, and vice versa, from Chinese into English (or to French or Japanese), when we needed advice from our contacts abroad. The court sessions and all the documents were

¹ This part is borrowed from Yi-ping Lin, “Reconstructing Genba: RCA Groundwater Pollution, Research and Lawsuit in Taiwan, 1970-2014.” *Positions* (Forthcoming).

in Chinese, so the many documents and scientific research papers written in English had to be translated into Chinese before being presented to the judges in court. While the defendant lawyers' foreign advisers and clients were accompanied by their (no doubt well-paid) professional interpreters in all the court sessions, the plaintiffs counted on student volunteers. There were a group of medical students and STS graduate students who actively participated in the translation efforts. Full texts of the nine RCA research papers were translated into Chinese, and sessions of English site-investigation reports, and the abstracts of many scientific reports discussed in the next two sessions were also translated before they were presented to the court by the expert witness or lawyers



One of the numerous group meetings (of nearly one hundred) with a core group of workers, their lawyers and advisors, after the first verdict in July 2015. Photo: Jung-lung Chang

The second type of translation was to transform the RCA employees' working and bodily experience into numbers, texts, tables and figures. Since there were more than 500 plaintiffs in the collective lawsuit, the judges ordered each plaintiff to complete a questionnaire to provide his/her working history, life styles, pregnancy, child birth, symptoms and diseases. The questionnaire was negotiated between the plaintiffs' and the defendants' lawyers before it was finalized. In 2011, with the help of social scientists, hundreds of lawyers, students, documentary filmmakers, and others collaborated in interviewing the plaintiffs. Information in the questionnaires was later summarized and calculated by the lawyers and volunteers in many different forms. A small group of student volunteers, under the supervision of sociologists, took further steps to collect and edit the oral history of 11 workers into an award-winning book entitled "Voices Not to Be Forgotten," which was published in 2013 by the Taiwan Association for the Victims of Occupational Injuries (a labor NGO that has helped RCA workers since the very beginning of their mobilization in 1998).



Book cover of the award-winning Voices not to be Forgotten

The third kind of translation, and the most difficult one, was from science to law. Both science and law have their own cultures and languages. During the RCA trials in the district court and the appeal court, a total of eleven expert witnesses testified in court; six called by the plaintiffs and five called by the defendants. With the exception of the law professor mentioned above, virtually all of them are college professors with doctoral degrees in medicine or natural science. They were used to teaching classes of students with science backgrounds or presenting their findings to colleagues at conferences; many of them were testifying in court for the first time in their careers. There has been considerable discussion about the competence of lay juries to evaluate such scientific and technical evidence in the common-law system.

Though Taiwanese judges were not lay juries, they had very little training in science and technology. Presenting scientific findings or technical evidence to the judges, and being asked and challenged by the lawyers during cross-examination, were brand new experiences to these college professors. For instance, expert witnesses Pau-Chung Chen and Tzue-Huei Ueng spent hours explaining to the judges how toxicological and epidemiological evidence was considered in the classification of carcinogenic and non-carcinogenic chemicals by the International Agency for Research on Cancer (IARC) and the U.S. Environmental Protection Agency (USEPA). Ueng had to describe in details how the experimental male and female mice were marked (on their tails), caged (in fives), and fed (with CA mixtures) in the laboratory. Bloody pictures of enlarged livers, ovaries, and uteri of mice exposed to organic solvents were projected in a slide presentation in the courtroom. Before the court hearings, this translation from animal to human, from toxicology to epidemiology, was discussed during brain-storming discussions with the lawyers, the workers and the STS-trained scholars. The latter worked as translators between the scientists, the workers and the lawyers.

During this nearly twenty-year-of long battle for justice, various works were therefore required to translate toxic exposure into a full recognition of the tort. Translating is often a shadow work. But through this endeavor, the victims and their supporters shared a common goal and kept faith that their efforts would not be in vain.



Hundreds of volunteer lawyers and students conduct a questionnaire survey for each plaintiff. Legislative Yuan, Taipei, 17 July 2011. Photo: Jung-lung Chang

References

Cranor, Carl. 2016 (2006). *Toxic Torts. Science, Law and the Possibility of Justice*. Cambridge University Press.

Chen, Hsin-hsing. 2011. “[Field Report: Professionals, Students, and Activists in Taiwan Mobilize for an Unprecedented Collective-Action Lawsuit against a Former Top American Electronics Company](#).” *East Asian Science, Technology and Society: An International Journal*, 5, 555–565.

Chen, Hsin-Hsing. 2014. “Culture of Visibility and the Shape of Social Controversies in the Global High-Tech Industry.” In Daniel Lee Kelinman and Kelly Moore (eds.) *Routledge Handbook of Science, Technology and Society*. London and New York: Routledge. 124-139.

Jasanoff, Sheila. 1995. *Science at the Bar. Law, Science and Technology in America*. Harvard University Press.

Jobin, Paul, Pascal Marichalar. 2015. “[À Taiwan, une victoire pour les victimes de l'électronique globalisée](#)” *Terrains de lutttes*.

Jobin, Paul and Tseng, Yu-hwei. 2014. “[Guinea Pigs Go to Court: Epidemiology and Class Actions in Taiwan](#)”, editor(s): Soraya Boudia, Nathalie Jas, *Powerless Science? Science and Politics in a Toxic World*, pp. 170-191, Oxford, New-York: Berghahn Books.

Jobin, Paul. 2010. “[Les cobayes portent plainte: usages de l'épidémiologie dans deux affaires de maladies industrielles à Taiwan](#)”, *Politix*, 23, 53-75.

Lin, Yiping. Forthcoming. “Reconstructing Genba: RCA Groundwater Pollution, Research and Lawsuit in Taiwan, 1970-2014.” *Positions*.

The Chinese Government Should Support Small Scale Agriculture for a Green China

Rowan Alcock, DPhil candidate in Politics, University of Oxford



If China truly wants to be the leader in the global effort to avoid the worst effects of climate change, it needs to once again look at the rural as the place for revolutionary answers. China's rapid growth has, to a large extent, been sustained and powered by the rural. First by extracting surplus wealth from the rural to invest in urban industrialisation during the state socialist era (Chan, 2009, 199; Chan, 1992), and, more recently, through large scale rural-to-urban migration (Chan, 2010, 516; Pun & Chan, 2013, 180). Rural 'hukou'² (household registration) holders, who would have once been expected to till the fields to supply China's population with food, have moved to the cities to become factory workers and builders. While rural 'hukou' holders' incomes increase due to this migration, significant negatives also occur. As Yan and Chen note, 'the aging and feminization of rural producers, fragmentation of familial life³, estrangement of social relations within villages, [and] growing rural disparity' (Yan & Chen, 2013, 964). There is also an environmental cost due to this mass migration of the relatively young. As the rural population becomes older on average, their physical ability to labour the fields decreases. As such, they have resorted to chemical pesticides, herbicides, and fertilizers as labour saving devices (Lora-Wainright, 2009, 68; Ebenstein *et al.*, 2011). The environmental and health effects of excessive chemical inputs is well documented. Excessive chemical inputs are found to be harmful to pollinators and organisms that create healthy soils, reduce biodiversity (Carrington, 2014), and pose health risks such as acute poisoning of agricultural workers and adverse developmental abnormalities in children (UN, 2017, 5-8).

² The 'hukou' system is an internal resident permit which allocates state services at place of residence. It is difficult - although not impossible - to change 'hukou' residency. For more information on the 'hukou' system see Chan (2009).

³ For information on 'left behind' children see Zhou *et al.* (2014)

In China an estimated 26 million hectares of farmland is said to be dangerously tainted by containments including pesticides (Zhang & Zhou, 2016).

Overuse of fertiliser is another environmental issue. China's fertilizer consumption per hectare of arable land, for example, far outstrips India, the USA and Brazil combined [Table 1]. This overuse of fertilizers is responsible for a large percent of China's CO2 emissions, water pollution, and less responsive land (Ebenstein *et al.*, 2011). The use of fertiliser in China is highly inefficient. It is estimated that 'it would be possible to decrease the nitrogen application rate by 30-60% while maintaining the same crop yield' (Ebenstein *et al.* 2011). However, Ebenstein *et al.* (2011) argue that fertilizer use is increasing due to labour shortages. One potential solution therefore is for migrants to return to the land.

Whilst China has only 7% of the world's arable land to feed one fifth of the world's population (Wu, 2011), what it has in abundance is a skilled and knowledgeable army of rural farmers armed with the knowledge of environmentally sustainable farming techniques (Schneider, 2015, 332; Cook, 2015). The frequently deployed counter-argument put forward against small scale agriculture is that it can't feed the world, yet the evidence is that 'There is an inverse relationship between the size of farms and the amount of crops they produce per hectare. The smaller they are, the greater the yield' (Monbiot, 2008). A further benefit of sustainable agriculture is climate change mitigation. Abandoning intensive industrialised agricultural practices such as mono-cropping and the blanket use of pesticides and fertilizers could create an agricultural environment that has the potential to sequester up to 2.6 gigatons of carbon per year or perhaps even more (Leslie, 2017; Hickel, 2016). Biodiversity would likely improve too (Vidal, 2016; Marshall, 2016). As China searches for 'green' jobs for its transition to an 'ecological civilization', an army of 'carbon farmers' (Simmons, 2016) could be the next Chinese rural revolution the world desperately needs.

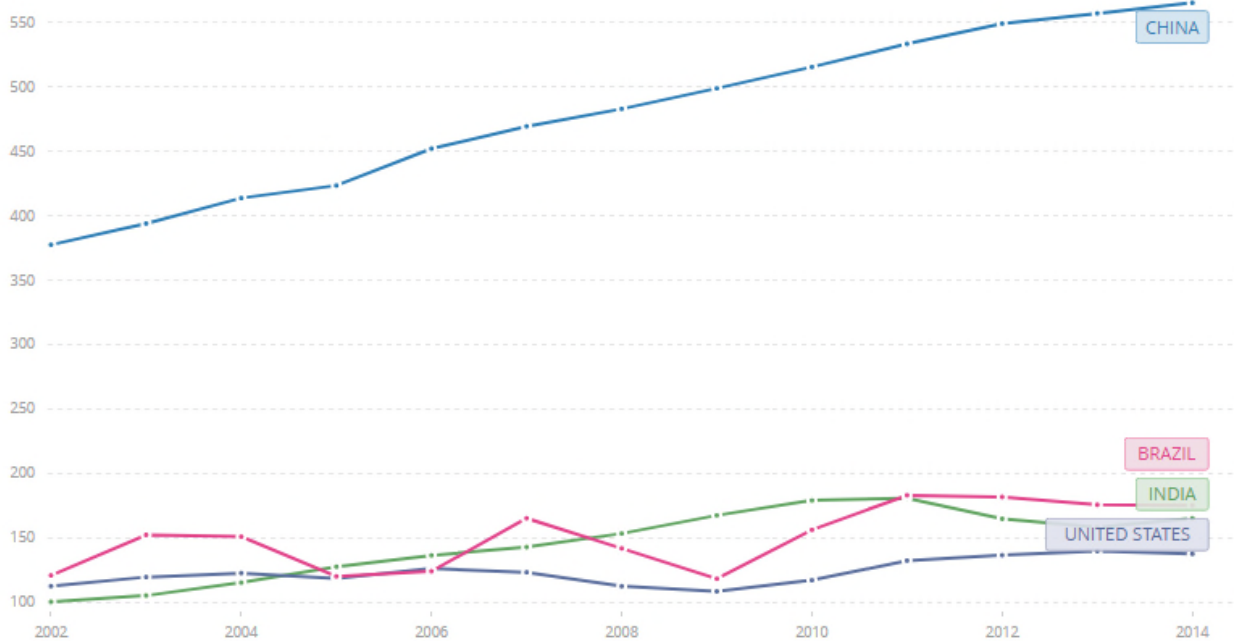


Table 1 Overuse of fertiliser is another environmental issue. China's fertilizer consumption per hectare of arable land, for example, far outstrips India, the USA and Brazil combined [World Bank Data]

This is not pie in the sky thinking. The ‘return to the countryside’ movement to develop sustainable agriculture has been happening in China on a small scale in peri-urban locations (Shi *et. al*, 2018; Cheng, 2014). An expansion of such citizen initiatives would need large scale state support. Of course this transition is not going to be easy. Significant push and pull factors mean migrants chose urban life and urban work. Incomes from farming would likely have to rise to attract people to return to the countryside, but this could be achieved by farmers directly selling organic standard products, which demand a price premium, to consumers and/or the state paying farmers to increase biodiversity and carbon sequestration. The lack of high quality health care and education in rural areas is another important factor for China’s rural-to-urban migration. But these public institutions could be strengthened with innovative ideas such as ‘education stations’ (Yan, 2016) and government support.

It is clear that the future of agriculture needs to change. As the Report of the Special Rapporteur argued, we should ‘move away from industrial agriculture’, ‘reduce pesticide use worldwide’, ‘develop a framework for the banning and phasing-out of highly hazardous pesticides’ and ‘promote agroecology’ (UN, 2017, 22). The over-use of fossil fuel derived fertilizer is unsustainable (Horton, 2017). Changes are needed in order to reduce the polluting of rivers and seas and to reduce GHG emissions (Wolfe *et al.*, 2011). The development of smaller sustainable farming businesses should be a major part of this transition (Horton, 2017; UN, 2017). China has the history, the labour power, and the expertise in sustainable agriculture to create a new, science-led, rural revolution of modern small-scale agroecological farming.

References

Carrington, Damian (2014) Insecticides put world food supplies at risk, say scientists, *The Guardian* <https://www.theguardian.com/environment/2014/jun/24/insecticides-world-food-supplies-risk> (Accessed 17/12/17)

Chan, Kam Wing (2010) A China Paradox: Migrant Labor Shortage amidst Rural Labor Supply Abundance, *Eurasian Geography and Economics*, 51:4, 513-530

Chan, Kam Wing (2009) The Chinese Hukou System at 50, *Eurasian Geography and Economics*, 50:2, 197-221

Chan, Kam Wing, (1992) Economic Growth Strategy and Urbanization Policies in China, 1949–82, *International Journal of Urban and Regional Research*, 16, 2:275–305.

Cheng, Cunwang & Shi, Yan (2014) Food Safety Concerns Encourage Urban Organic Farming, Chapter 9, in; Chinese Research Perspectives on the Environment: Public Action and Government Accountability, edited by Liu Jianqiang, *BRILL*

Cook, Seth (2015) Sustainable agriculture in China: then and now, IIED, <https://www.iied.org/sustainable-agriculture-china-then-now> (Accessed 14/01/18)

Ebenstein, Avraham; Zhang, Jian, McMillan, Margaret S., Chen, Kevin (2011) Chemical Fertilizer and Migration in China, NBER Working Paper No. 17245

Yan, Hairong and Chen, Yiyuan (2013) Debating the rural cooperative movement in China, the past and the present, *The Journal of Peasant Studies*, 40:6, 955-981

Hickel, Jason (2016) Our best shot at cooling the planet might be right under our feet, *The Guardian*. <https://www.theguardian.com/global-development-professionals-network/2016/sep/10/soil-our-best-shot-at-cooling-the-planet-might-be-right-under-our-feet> (Accessed 16/12/17)

Horton, Peter (2017) We need a radical change in how we produce and consume food, *Food Security*

Leslie, Jaques (2017) Soil Power! The Dirty Way to a Green Planet, *New York Times* <https://www.nytimes.com/2017/12/02/opinion/sunday/soil-power-the-dirty-way-to-a-green-planet.html?action=click&pgtype=Homepage&clickSource=story-heading&module=opinion-c-col-right-region®ion=opinion-c-col-right-region&WT.nav=opinion-c-col-right-region> (Accessed 16/12/17)

Lora-Wainwright, Anna (2009) Of farming chemicals and cancer deaths: The politics of health in contemporary rural China, *Social Anthropology*

Marshall, Claire (2016) Nature loss linked to farming intensity, *The BBC* <http://www.bbc.co.uk/news/science-environment-37298485> (Accessed 16/12/17)

Monbiot, George (2008), Small Is Bountiful, <http://www.monbiot.com/2008/06/10/small-is-bountiful/> (Accessed 16/12/17)

Pun, Ngai & Chan, Jenny (2013), The Spatial Politics of Labor in China: Life, Labor, and a New Generation of Migrant Workers, *South Atlantic Quarterly*

Schneider, Mindi (2015) What, then, is a Chinese peasant? Nongmin discourses and agroindustrialization in contemporary China, *Agriculture and Human Values*

Shi, Yan; Merrifield, Caroline; Alcock, Rowan; Cheng, Cunwang & Bi, Jieying, (Forthcoming), Exploring Innovative Ways for Modern Agriculture towards Rural and Urban coordinated development in China: A Participatory Study of Shared Harvest CSA and Little Donkey Farm.

Simmons, Daisy (2016) Carbon farming: What is it, and how can it help the climate?, *Yale Climate Connections* <https://www.yaleclimateconnections.org/2016/10/could-carbon-farming-help-the-climate/> (Accessed 16/12/17)

UN, (2017), Report of the Special Rapporteur on the right to food, *United Nations General Assembly*. <https://documents-dds-ny.un.org/doc/UNDOC/GEN/G17/017/85/pdf/G1701785.pdf?OpenElement> (Accessed 16/12/17)

Vidal, John, (2016) A switch to ecological farming will benefit health and environment – report, *The Guardian* <https://www.theguardian.com/environment/2016/jun/02/a-switch-to-ecological-farming-will-benefit-health-and-environment-report> (Accessed 16/12/17)

Wolfe, David; Beem-Miller, Jeff; Chatrchyan, Allison; & Chambliss, Lauren, (2011), Farm, Energy, Carbon and Greenhouse Gasses, *Cornell University*
http://climatechange.cornell.edu/wp-content/uploads/2013/03/farm_energy.pdf
(Accessed 14/01/18)

Wu, Yanrui, (2011) Chemical fertilizer use efficiency and its determinants in China's farming sector. *China Agricultural Economic Review*.

Yan, Haijun (2016) Sparrow Schools: The Empty Shells of China's Countryside, *Sixth Tone*
<http://www.sixthtone.com/news/626/sparrow-schools-the-%3Cspan-class%3D%22highlight%22%3Eempty%3C%2Fspan%3E-shells-of-chinas-countryside>
(Accessed 16/12/17)

Zhang, Yan & Zhou, Chen (2016) China's tainted soil initiative lacks pay plan, *China Dialogue*, <https://www.chinadialogue.net/article/show/single/en/9028-China-s-tainted-soil-initiative-lacks-pay-plan> (Accessed, 14/01/18)

Zhou, Minhui; Murphy, Rachel; Tao, Ran (2014) Effects of Parents' Migration on the Education of Children Left Behind in Rural China, *Population and Development Review*, Vol.40(2), pp.273-292

Revisiting the Air Pollution Crisis in China – a lesson on toxicity, sociality and humanity

Fangfang Li

Universiteit van Amsterdam, Department of Anthropology
United Nations University, International Institute for Global Health



Image Courtesy: Nicolò Lazzati (www.flickr.com/photos/the-niki/4331676192/in/photolist-7A...), Licensed under the Creative Commons Attribution 2.0 Generic | Flickr

A Toxic Smog Crisis

In 2017, China faced a renewed **smog crisis**, even worse than similar situations in past years. Most of the country was affected, including southern regions previously considered 'safe' from air pollution (e.g., Guangzhou). Smog consists of a mixture of tiny but highly toxic particles, of which fine particulate matter (PM_{2.5}) is the most hazardous to human health. While coal consumption can yield the energy and light that are important for everyday life, **research** has shown that coal is responsible for the majority of PM_{2.5} emissions, which carry significant consequences for health. In China, more than **one third of lives lost** are attributable to PM_{2.5} pollution. During days of heavy smog, hospital admissions due to respiratory emergencies, stroke, heart attack, **cognitive impairment** and some non-communicable diseases (NCDs) spike, **affecting millions of people**, particularly in densely populated urban areas.

A Socio-cultural Problem

Despite biomedical, epidemiological, and pharmaceutical evidence on the effects of toxic air, its social and cultural meanings are still being constructed. Beyond the stark realities of scientific evidence, the smog crisis profoundly transforms our everyday lives, both personally and in relation to others. In addition to the direct harm to our bodies and **brains**, these invisible but highly toxic particles can have broad indirect effects. For example, they can **disrupt our eco-agricultural system** and influence which places we build, live in and travel to. Through these and other relationships, the phenomenon of smog mediates our own behaviors and values and reshapes our relationships with others. Most importantly, as we begin to understand these complex chains of consequences, our imagined vision of the nexus of poverty, vulnerability, inequality, humanity and sustainability becomes yet further complicated.

Expanding the discussion around the smog crisis to encompass a larger socio-cultural realm that reconciles the living experiences of as many individuals as possible might lead us to more creative and productive solutions. Rather than providing an authoritative analysis, this short piece should be seen as an exploration of socio-cultural aspects of the air pollution crisis and some potentially productive courses of action.

Approaching the Smog Crisis through a Social Lens

Local, provincial and state governments in China have all strived to limit exposure to harmful toxins by—among other actions—closing coal mining fields and power plants and investing in **clean-energy innovations**, yet much work remains, both short- and long-term, if we are to fulfill the UN goal of ‘**leaving no one behind**’ as we strive to achieve a healthier environment.

First, in considering responses to the air pollution crisis, the focus should be on those who are most vulnerable to its toxic effects – such as **children, elderly, coal miners, low-income households** and **those suffering from chronic diseases** – these groups also often have low capacity to reduce their exposure or respond to threats. Among needed actions are policies to ensure an adequate supply of health service personnel and facilities to treat those who fall ill during episodes of smog. Subsidies should be promptly provided to individuals and households suffering from air pollution-induced illnesses to help ease their financial burdens and reduced labor productivity. Also, our public health system must be accountable to all, regardless of their ‘**hukou**’ status (*hukou* is a household registration system in China based on place of birth), so that both urban residents and migrants receive equitable treatment. These are just a few of the many actions that would flow from a focus on those most in need.

Second, in interpreting the role of ‘place’ in constructing an experience of ‘toxic living,’ we should be aware of not only geographic but also socio-cultural spaces, where

toxic environments and human well-being can be interlinked. For instance, the smog crisis is likely to reduce our level of outdoor activity (and thus our interactions with others); change our consumption behaviors from offline to online, and increase market demand for [air-cleaning products](#) (e.g., anti-dust masks and indoor air purifiers). It can disrupt our travel routines due to unexpected flight cancellation and closure of public services. More profoundly, it can affect our food options and dietary habits by damaging our soil and farming systems; reducing food production; and [increasing vegetable prices](#). All of these patterns force us to reimagine our smog-related health risks in relation to the social and cultural aspects of where we choose to live, work, eat, exercise and build relationships.

Third, managing complex problems such as air pollution requires considering cascades of social consequences to avoid [system failure](#) (Chapman, 2004), where solving one problem can potentially lead to creating more. For example, in China's aggressive determination to reduce emissions of toxic pollutants, the government closed or curtailed a large amount of coal mining activities virtually overnight, leaving countless miners unemployed and their dependents with drastically reduced incomes and hopes. To make it worse, given their less privileged educational background and lack of experience outside of the coal industry, miners often have no option but to move to other mines for jobs. For those not lucky enough to be able to relocate, futures are more uncertain. Job training and financial remedies should be offered to help workers survive difficult transitions like these, reducing their suffering to a minimum. More broadly, though, it is clear that a more systematic approach to the smog crisis that accounts for cascading consequences and feedback relationships will contribute to better outcomes.

Lastly, alleviating smog requires a [transdisciplinary approach](#) that allows us to engage with various stakeholders and work across disciplines to promote greater understanding of the complexity of the challenge and our options for action. Lab-based scientific evidence should be considered alongside our findings from social reality to inform better decision-making. For instance, while we need epidemiologists to educate us about the harms of toxins in the atmosphere, we also need demographers to alert us to the characteristics of populations that might put them at risk; and sociologists to help us illuminate peoples' needs and motivations with respects to pollution in their environment. With better knowledge in hand, we can look to the emergence of strong leadership and partnerships at all levels to work out the best solutions. To curb this toxic crisis, we need concerted global actions, and the sooner the better.

Conclusion

This article calls for a reconsideration of the impact of the smog crisis from a social and humanitarian perspective, an inquiry into how the organization of our everyday lives and work is affected by the pollution we experience, and vice versa. We must begin to identify the limits and blind spots in our knowledge; to explore alternative approaches;

and eventually to work out a greater understanding of the complexity and nuance of the crisis within a broad socio-cultural framework. Only when we remove the barriers inherent in our current paradigms for knowledge and actions can we develop better solutions to this persistent toxic crisis.

Reference

Chapman, J. (2004). *System failure: why governments must learn to think differently*. London: Demos.

About the Author

Fangfang Li is an anthropology and global health doctoral candidate from the Amsterdam Institute for Social Science Research, University of Amsterdam and the The Barcelona Institute for Global Health (ISGlobal). Her current research focuses on food inequality amongst hypermobile youths in Malaysia, Singapore and Taiwan. She is currently based at the United Nations University International Institute for Global Health (UNU-IIGH) in Kuala Lumpur, where she has been awarded a PhD fellowship to complete her thesis writing.