

Air Pollution and Grassroots Echoes of “Ecological Civilization” in Rural China

Mette Halskov Hansen* and Zhaohui Liu†

Abstract

This article places the study of rural environmental activism in the wider context of the Chinese government’s promotion of Ecological Civilization (*shengtai wenming* 生态文明). Ecological Civilization is, we argue, a top-down imaginary of China’s future that opens up space for environmental agency while setting authoritative standards for how to frame protests in a logic of science and social stability. The article compares how residents in a small cluster of villages in Zhejiang province dealt with different sources of air pollution over a span of ten years: how, when and why they chose to negotiate with local officials and industrial managers to prevent or reduce air pollution, and what the outcome was. We found that in addition to a consciousness of the right to protest, villagers had come to regard the ability to evoke science in negotiations with officials and industrial managers as crucial for success. We suggest that the forms of environmental activism we observed were in effect “containable protests” that befit the state-initiated national imaginary of an ecologically civilized world.

Keywords: rural protests; air pollution; environmental consciousness; Ecological Civilization; socio-technical imaginaries; popular perceptions of science

This article explores how the nationally growing awareness in China of the dangers of air pollution has manifested itself in villages where both household cooking and industrial production cause emissions of greenhouse gases and pollutants. Based on rural fieldwork, we place villagers’ experiments with air pollution activism within the broader context of the state-guided initiative to structurally reform China to become “ecologically civilized.” Ecological Civilization (*shengtai wenming* 生态文明), fully embraced by the Xi Jinping administration in 2013,¹ is envisioned as the ultimate amalgamation of socialism, harmonious society, welfare,

* University of Oslo. Email: m.h.hansen@ikos.uio.no.

† Zhejiang University. Email: 651147892@qq.com (corresponding author). The authors contributed equally to the research and share lead authorship.

1 See Schmitt 2016, chapter 3 for an overview of the history of Ecological Civilization and how it became part of CCP ideology.

development, and a sustainable approach to environmental resources.² It has been promoted as an ideological framework for guiding the future of Chinese politics and society and for setting more specific goals concerning environmental education, technological innovations, energy use, recycling, emission reduction, and local environmental performance of officials through, for instance, revised cadre evaluation.³ Where science in the field of climate change points to non-linear and unpredictable changes of the earth system, Ecological Civilization offers anthropocentric surety that a sustainable and clean future for China will be achieved under the leadership of the Communist Party.⁴

Ecological Civilization is a top-down imaginary that may seem far removed from the rural people who are the focus of this article. However, the explosion of traditional and social media's coverage of environmental issues, not least air pollution,⁵ combined with the new requirements for local officials to improve the environment,⁶ have ensured that its main message of the need to integrate environmental protection and pollution control into the governance of China is not lost on ordinary citizens. Within a remarkably short time and largely as a result of exceptionally heavy smog over northern cities in the winter of 2012/13, terms such as "sulphur dioxide" (*eryanghualiu* 二氧化硫), "carbon dioxide" (*eryanghuatan* 二氧化碳), "PM_{2.5}" (*PM erdianwu* PM 二点五), and "PM₁₀" (*PM shi* PM 十) have become household terms in urban areas, and in many rural areas. People may not use the term "Ecological Civilization" in their daily conversations, but words such as "ecological" (生态 *shengtai*), "environmental protection" (环保 *huanbao*), "green" (绿色 *lüse*) and "environment" (环境 *huanjing*) are now used in a plethora of contexts to account for what is considered right and wrong, civilized and uncivilized, outdated or prescient behaviour. This is also to some extent the case in villages, although they are rarely the centre of attention when the problem of air pollution is debated. In our interviews, villagers frequently explained to us how the state's new environmental policies and the media attention on air pollution influenced their own perceptions: "When the state (*guojia* 国家) started to deal with environmental protection (*gao huanbao* 搞环保) there was suddenly a lot more on TV about it, and we also started to understand that it is actually a big problem also for us here," one man explained. Another elderly woman simply declared that "thanks to TV our [environmental] consciousness has risen!"

Anthropological studies have long contested the widespread assumption that people in rural China have an especially weak environmental consciousness due to low levels of education. Anna Lora-Wainwright and her colleagues, for instance, have shown how rural inhabitants, who are well aware of pollution's negative impact on their health, may deliberately choose to accept this risk when there are no viable alternative options, or when they receive sufficient

2 Ministry of Environmental Protection 2015a.

3 Ahlers and Shen 2017 (this issue); Wang 2013.

4 Ministry of Environmental Protection 2015c.

5 Li and Svarverud 2017 (this issue); Yang 2016.

6 Ahlers and Shen 2017 (this issue); Grano 2016; Xie 2016; Johnson 2014.

economic compensation.⁷ Bryan Tilt has demonstrated how industrial workers may be willing to tolerate pollution, not because they are unaware of its hazardous health consequences, but because protesting against it would threaten their economic livelihoods.⁸ And Yanhua Deng and Guobin Yang have revealed how villagers take into account local community relationships in addition to economic considerations when deciding whether or not to protest against polluting industry.⁹ What we still need to explore and better understand is how, when and why people choose to respond to air pollution caused by different sources (including, notably, household air pollution), and how local reactions, in the form of protest, acceptance, as well as denial, connect to larger national and global policies and campaigns.

In this article we explore the history of how and why residents in a small cluster of Chinese villages in the course of a decade choose different strategies to deal with air pollution coming from different major polluting sources, such as brick factories, plastics factories, incinerators, and their own use of wood for cooking. We further argue that villagers have come to embrace the imaginary of Ecological Civilization as projected through massive media coverage and government campaigns. Villagers used the authorized language of the state to express their grievances, as protesters have done consistently in the PRC,¹⁰ and the environmental language of the state is now expressed, for instance, by means of the imaginary of a future Ecological Civilization. Villagers and local cadres have translated this language of scientific reasoning and social harmony into attempts to negotiate with authorities while searching for scientific arguments and containing environmental activism within a small local area limited to a smaller group of people. Thus, before zooming into the villages that are the focus of our study, we take a view from above, discussing in some more detail our suggestion of approaching Ecological Civilization as a socio-technical imaginary of China's (and ultimately the world's) future.¹¹

An Imaginary of a Sustainable, Developed and Socially Stable China

The adoption of the phrase Ecological Civilization as Party ideology in 2007 was a sign of the government's acknowledgement that China was paying a very high price for its "economic miracle" – a price that more and more citizens were also beginning to question. With Ecological Civilization, the authorities have finally elevated environmental protection to close to the level of priority that has hitherto been reserved for economic development and social stability. Ecological Civilization drew on previous socialist civilization (*wenming* 文明) campaigns

7 Lora-Wainwright et al. 2012.

8 Tilt 2006, 2013.

9 Deng and Yang 2013. See also Jing 2000; Hathaway 2013; Lora-Wainwright 2009, 2013; Steinhardt and Wu 2016; O'Brien and Deng 2015; Zhong and Hwang 2016.

10 Perry 2009, 18.

11 Jasanoff 2009.

aimed at strengthening civil morality and adherence to Party ideology, for instance, the campaign for spiritual civilization (*jingshen wenming* 精神文明) that began in the early 1980s and was revitalized after 1989 as a response to the Tiananmen demonstrations. Ecological Civilization also co-opted prevalent slogans such as “a scientific outlook on development” (*kexue fazhan guan* 科学发展观), which was coined in 2003 by then president Hu Jintao in a call for a more science-based, sustainable form of development and a harmonious society (*hexie shehui* 和谐社会). Thus, Ecological Civilization fits into a larger pattern of consecutive efforts in the PRC to promote the status and use of science and technology in order to strengthen the country. Science campaigns from the 1950s through to the 1980s mainly targeted intellectuals and students who were encouraged to study science to strengthen the country,¹² and efforts to further popularize science (*kepu* 科普) were enhanced with the spread of internet use in China.¹³ With Ecological Civilization, the promotion of science has been integrated into a more holistic vision of a sustainable economically developed state and socially harmonious society, which is, at least in principle, intended to involve the entire population. After thirty years of rapid economic growth and a considerable raise in the general level of education, including the rural population, the state’s promotion of science increasingly accentuates not just China’s need to study and apply science, but also the need for China to take a lead in scientific and technological innovation¹⁴ (*zizhu chuangxin* 自主创新¹⁵).

The state-initiated imaginary of Ecological Civilization is a promise to the population that with the right technologies and policies, and the heightened environmental consciousness of all citizens, a turn towards green need not reduce economic growth. At the abstract level, it is a political imaginary that insists on transgressing what has been termed the most fundamental double bind of 21st-century global capitalism, namely the chronic tension between economic development and human sustainability.¹⁶ In China, this double bind is further tightened by the authorities’ reliance on rapid economic growth as a main guarantor for social stability and their own political legitimacy. In a 2016 interview about Ecological Civilization, Zhang Xinsheng, the newly elected president of the International Union for Conservation of Nature, and former Chinese vice-minister of education, underlined that Ecological Civilization is meant to be a global vision that it is built on the foundation of a culture of commerce. It is an imaginary aimed at transforming the world without changing the path of global capitalist economic development: “[Ecological Civilization] implies a transformation of civilizations that does not eliminate the commercial civilization

12 Zhou 2013 [1956]; Zhao 2003; Yang 2004.

13 See, for instance, the government’s “popular science net” <http://www.kepu.gov.cn/>. Accessed 1 November 2016.

14 E.g. Fan et al. 2013.

15 The term has been frequently used in the past ten years and has been translated as self-dependent or self-determined innovation.

16 Eriksen 2016, 7.

(*shangye wenming* 商业文明) because these two are mutually reinforcing. Ecological Civilization evolves from its base in the commercial civilization” (*Zai shangye wenming de jichu zhi shang shenghua wei shengtai wenming* 在商业文明的基础之上升华为生态文明).¹⁷

Ecological Civilization began as a top-down initiative with few concrete plans and little direction on how to reach the promised goals, but as an abstract imaginary it nevertheless helped to legitimize and revitalize China’s “green public sphere,”¹⁸ including the media’s expanding discourse on ecological and sustainable development.¹⁹ The political status of Ecological Civilization was further elevated and safeguarded in 2013 when President Xi Jinping decided to adopt it as a framework for the concrete technical, legal and social standards that are reflected in a range of new environmental laws and regulations, not least those regarding air pollution.²⁰ The main governmental documents produced in recent years on Ecological Civilization have arguably contributed to the emergence of a new Chinese paradigm on successful economic development now also being dependent on further progress in environmental safety and technology.²¹ Furthermore, due to Ecological Civilization’s emphasis on the need to heighten environmental consciousness and improve the environmental behaviour of all its citizens, it has also in practice opened new doors – while keeping others closed – for environmental activism.

This has not gone unnoticed among the population in rural China. Media, schools, local administrations, and environmental bureaus have been required to expand their attempts to promote “environmental consciousness” and “civilized” behaviour through posters, information on new laws and regulations, and the introduction of new supplementary teaching material about environmental protection and individual responsibility.²² The media covers environmental issues much more extensively than it did ten years ago; school children may be heard to lecture their parents about the need for recycling; and in villages, slogans requiring villagers to sort their garbage and keep the area green have been substituted for propaganda posters about birth control. Local administrations and cadres are under increased pressure to implement environmental regulations, and villagers are aware of this. In our survey of 200 urban and 100 rural households, 49 per cent of rural residents compared to 40 per cent of urban residents found that control of air pollution was now more important than economic development.²³

17 Pang et al. 2016.

18 Yang and Calhoun 2007.

19 For instance Stern 2013, 135. See also Oswald 2016; Geall 2015.

20 Note that some academics and activists are now also discussing how to make use of Ecological Civilization to change the course of research, journalism and education in China. See Sawyer 2015; Duara 2014.

21 Wang 2013.

22 E.g. teaching material for primary and junior secondary schools developed by Zhejiang and Hangzhou Environmental Protection Bureau.

23 See also Li and Tilt 2017 (this issue) who show that urban residents in Tangshan ranked environmental

Fieldwork and Local Air Pollution

Our field site since 2014 has been Quzhou city in Zhejiang province and one of its rural neighbourhoods made up by a cluster of three villages, here called J-village, W-village and H-village. These villages, 15 kilometres from Quzhou city centre, differed in some relevant aspects from field sites described in other comparable studies. First of all, the village area was not known to be especially polluted.²⁴ Also, prior to our fieldwork, there was no indication, either from official reports or from scholars we knew who were familiar with the area, that villagers were suffering from an especially high occurrence of diseases that could be directly related to pollution.²⁵ Pollution was not of the type that gained more notoriety through much publicity and attracted attention especially among middle-class inhabitants in cities, resulting in, for instance, PX and incinerator protests.²⁶ Finally, the villagers had no history of large-scale clashes with officials or systematically organized protests that had reached the media's attention or generated interest from NGOs. We chose this particular field site because our personal connections there ensured access, and because it fulfilled one major criterion set by the atmospheric scientists in our research team, namely that many families were still using solid fuel for cooking.

Soon after we arrived in the villages it became clear that what local people, or rather *some* local people during *certain* periods of time, were concerned with was the health and local environmental impact of industrial air pollution coming from factories in their immediate neighbourhood. Based on measurements of PM_{2.5} concentration, Quzhou city was ranked 103rd out of 378 cities where air pollution was measured in 2015 (first on the list being the cleanest city).²⁷ Thus, even though Quzhou was not known to be one of China's most polluted cities, there were enough indications that air pollution was threatening health both in the city, where air quality was actually measured, and in the rural areas, where there was both industry and household air pollution, the latter largely the result of the use of wood for cooking. Quzhou has the highest rural population among all 11 prefecture-level cities in Zhejiang province²⁸ and the lowest level of average education (together with Lishui).²⁹ It is a national hub for the chemical industry, and, at the same time, it has the highest percentage of household use of solid fuel (37 per cent).³⁰

footnote continued

protection higher than income and jobs but lower than, for instance, family harmony and children's education.

24 Unlike, e.g., Tilt 2006; Lora-Wainwright et al. 2012.

25 Unlike, e.g., Lora-Wainwright 2013; Tilt 2013.

26 Johnson 2013; Liu 2013.

27 Data downloaded from China National Environment Monitoring Center <http://106.37.208.233:20035/>. Accessed 1 November 2016.

28 Office for the Population Census of Zhejiang 2012a, 1: 52–52 and 292–97.

29 Zhejiang Statistics Bureau 2014, 190 and 200.

30 Calculation based on Office for the Population Census of Zhejiang (2012b, vol. 5, 3169–70).

Household air pollution has recently come under increased scrutiny as a major source of pollutants, and according to a 2014 World Health Organization (WHO) report, 3.4 million of the 7 million annual premature deaths in the world related to air pollution were the result of households using solid fuel, especially coal or wood, for cooking and heating.³¹ However, as is generally the case in China, none of Quzhou's 11 air pollution measuring stations was located at the centre of rural areas, making it impossible to determine precisely how much villagers had been exposed to air pollution from industry and households combined.³² For urban areas in Quzhou, on the other hand, official measurements were published daily on government websites and on its sponsored app "Love Environmental Protection" (*ai huanbao* 爱环保).³³ According to these figures, Quzhou's 2014 annual mean level of PM_{2.5} was 57 µm/m³.³⁴ On its worst days, the level of PM_{2.5} in Quzhou could reach several hundreds of µm/m³, but this was still far from the 1,000 µm/m³ or more registered on the worst days in northern cities such as Tangshan in the study by Li and Tilt 2017 (this issue). Regardless of these comparisons, Quzhou city's air pollution was well above the level known to cause serious health issues, and the annual average level was more than four times the 10 µm/m³ annual mean, the guideline limit set by WHO in 2005.³⁵

In spite of the lack of monitoring stations in the villages, it was not difficult for our research team to determine which sources of air pollution potentially affected villagers most. Less than three kilometres from the village cluster was the prestigious prefectural industrial park, with more than 50 factories producing tiles, bricks, cement, textiles and furniture. There was a coal-burning brick factory (brick factory B) on the main road of J-village very near the residential area, and furnaces burning unsorted garbage collected every morning from villagers' households were active in the vicinity of all the three villages. Until recently, there had also been other factories, including a previously collectively owned brick factory (brick factory A) and a plastics factory, which we return to below. Finally, all the villages were affected by household air pollution produced from the use of biomass for cooking. The vast majority of households in the villages had one or two gas cookers and an electric rice cooker that most families used on a daily basis. However, either within the kitchen or in a separate small building most families had a traditional oven, a *tuzao* 土灶, for cooking with

31 WHO 2014, "WHO: 7 million premature deaths annually linked to air pollution." <http://www.who.int/mediacentre/news/releases/2014/air-pollution/en/>. Accessed 15 March 2016. See also Aunan, Hansen and Wang 2017 (this issue).

32 Between 2015 and 2017, the *Airborne* project has made three rounds of measurements of personal exposure to PM_{2.5} over a 24-hour period among the main cooks in 12 rural and 12 urban families in Quzhou, and we have measured air pollution in 25 rural and 25 urban kitchens. In January 2017, we added measurements of ambient air pollution in the village cluster. See Aunan et al., work in progress.

33 Ahlers and Hansen 2017.

34 Zhejiang Environmental Protection Bureau (n.d.). http://www.zjepb.gov.cn/root14/xxgk/zfwj/zh/201501/t20150126_319617.html. Accessed 14 March 2016.

35 See also Aunan, Wang and Hansen 2017 (this issue).

firewood. In our survey, 50 per cent of the 100 rural households said that they frequently used the *tuzao*, and we would often observe this during our fieldwork, especially among the elderly population and the poorest families. Several reasons exist why people continued to use these stoves. In W-village, inhabitants had a ready supply of free fuel in the form of pruned branches and trees from their orange groves – the main source of income for 80 per cent of the villagers. In addition, some villagers pointed out that the “food tasted better” when made on a *tuzao*, and the stove was considered convenient – even necessary – when cooking special dishes for larger groups of people in connection with New Year, weddings etc. On the other hand, coal-burning stoves, which had been quite popular up until the 1990s, since then had for quite some time been regarded by everyone as being dirty and inconvenient, and we observed them tucked away in many houses.

Our fieldwork in these villages was carried out in several rounds, mostly with both of the authors and several student assistants working together conducting interviews and surveys. In some periods of our fieldwork, we were working with atmospheric chemists who were measuring and analysing air pollution exposure. The authors of this article conducted a total of 109 in-depth interviews with inhabitants in Quzhou, including residents in the three villages and two urban communities, village cadres, officials from the local government and Environmental Bureaus, and immigrant workers from Guizhou living in brick factory B, in addition to carrying out the previously mentioned 300-household survey. The longer qualitative interviews and our observations constitute the main sources of data for the following sections that focus on villagers’ diverse ways of responding to the different sources of local air pollution.

Containable Protests: Science, Negotiation, and the Conscious Lack of Organization

When we initially asked villagers if they were willing to be interviewed and allow the atmospheric scientists in our team to measure the air quality of their homes, two types of responses were typical, providing insight into how residents made sense of air pollution in their community: First of all, people were happy to receive us because they regarded us as “scientists” (*kexuejia* 科学家) who possessed, or were able to produce, the scientific knowledge of local air pollution that they felt could be of help to them. They expressed a high level of confidence in science as a means of objectively determining the quality of their air, and they explicitly expressed expectations that our research would help bolster their own or fellow villagers’ protests against air pollution. Second, while all villagers we met with responded positively to having their own household air quality measured by the atmospheric scientists in our team, not one single interviewee considered household air pollution to be a problem. In fact, they dismissed the topic entirely, explaining that cooking

with the use of solid fuel was a longstanding tradition that to their knowledge had never caused health problems for them.³⁶

This is perhaps not so surprising considering the limited attention household air pollution receives in documents and reports related to Ecological Civilization, as well as in environmental policies and in the media. Our search through 18 national- and provincial-level documents, our interviews and media articles related to Ecological Civilization, rural development, and air pollution control, showed that household air pollution was rarely mentioned. One of the few exceptions was the Air Pollution Prevention and Control Action Plan from 2013 that mentioned residential coal use (not biomass), and called for a transition to cleaner energy supplies, especially natural gas.³⁷ The topic of household air pollution was also briefly evident in connection with general calls on villagers to take responsibility for saving household energy and become more environmentally conscious,³⁸ or in statements about the need to promote “stoves that are environmentally friendly and save energy.”³⁹ Practically everyone we talked to in the villages expressed surprise that among all the problems they experienced with pollution – affecting water, food, soil, air – it was *household* air that scientists had come to study. This confirmed other research showing that what “experts may regard as very serious pollution with potentially severe effects may, for local citizens, be an habitual situation posing distant risks that they choose to ignore.”⁴⁰

Nevertheless, in our case the very fact that scientists came to their villages to study air pollution and local people’s reactions to it confirmed villagers’ suspicion that air pollution was indeed a problem. Since 2007, groups of villagers and individuals had been involved in different types of activism directed towards what they identified as four major air polluting sources. However, this did not include air pollution produced by households or furnaces burning their own garbage. The study of villagers’ reactions over time to these four different sources of air pollution shows some interesting similarities with urban middle-class environmental activism, as discussed by Thomas Johnson.⁴¹ Quite similar to Johnson’s cases of urban protesters, village activists made a strategic “shift towards greater rationality,” and they portrayed themselves as “rational” (*lixing* 理性) actors searching for scientific data and facts, preferring negotiations over direct confrontation.⁴² The significant differences, on the other hand, grew out of the villagers’ more peripheral and less powerful status as mainly elderly peasants and with a relatively high proportion of female residents (because many men, though

36 We discuss this in more detail in another article co-authored with atmospheric scientists in our team (Aunan et al., work in progress).

37 Central Government of the People’s Republic of China, 2013, point 4.

38 Ministry of Environmental Protection 2015a, chap. 3 sec. 8.

39 Ibid. chap. 5 sec. 15.

40 van Rooij 2010, 60.

41 Johnson 2013.

42 Johnson 2013, 365.

formally registered in the villages, worked outside of them). Villagers had to rely largely on themselves and to some extent their village cadres, and, unlike the urban activists, they received no NGO attention or support in their search for scientific arguments. They operated – and consciously so – without leadership or organization, as we shall see in the cases discussed below.

The plastics factory: governance and clans

A plastics factory in the vicinity of the three villages was planned in 2009 and opened in 2010 after a call from the township government for the establishment of a greater amount of private industry. The manager from another province along with local officials had reassured the inhabitants of the three villages closest to the site (W-village, J-village and H-village) and their village cadres that the factory would not have any serious polluting effects. However it quickly became apparent to everybody that it was, in fact, producing thick, foul-smelling smoke that blew directly into, especially, W-village and to some extent also into J-village.

Studies from around the world have shown that people who want to complain about local pollution tend first to contact the person or institution they directly blame for their grievances.⁴³ The villagers in our study were no different. Over a prolonged period of time, a group of men from W-village approached the factory manager and tried to negotiate, but to no avail. As the villagers recalled, their arguments were weak and subjective, and it was easy for the manager to argue that he was following regulations and had the backing of the local government. More powerful ammunition was needed, and five men from W-village, with strong backing from the local population, prepared official complaints, developing basic scientific arguments against the air-polluting plastics factory, partly with the help of a younger man from W-village who was studying chemistry in a university. They wrote a number of formal letters of complaint (*gao-zhuangxin* 告状信), but in order to avoid documentation that might harm them in the future, they gradually altered their strategy to one of only making telephone calls to officials, or turning up in person at offices. More than 70 phone calls were made, and at some point a group of more than ten villagers approached the manager with the intent to negotiate once again. By this time, too, they had also managed to get officials from the township involved in renewed negotiations because some of those officials had begun to worry that the situation might escalate, and, as the village cadres explained, those officials were already becoming exasperated by the number of phone calls they were receiving.

An important feature of the process was the villagers' intentional lack of clear leadership and rigid organization. One of the four influential brothers, all of whom were actively engaged in the protests, strongly emphasized that the protest

43 van Rooij 2010, 57.

must have no leaders and not be organized. It was crucial for them to present their activism as a form of sporadic complaint for which no individuals could be directly blamed for instigating disorder. It was, Mr W explained, a matter of arguing on the basis of reason (*julilizheng* 据理力争) and building scientific arguments. Mr W was in his early sixties, a peasant who had lived his entire life in the village and who had fewer than six years of education. He described what he and his brothers wrote in one of their letters of complaints:

This factory produces a kind of plastic shell (*suliao* 塑料壳) – the chemical term is 1,4-dioxine and the gas it produces causes cancer. It is a carcinogen (*zhizhaili* 致癌物质). When the common people (*laobai* 老百姓) carry out manual labour in its vicinity they can smell it, they become dizzy, they feel nauseated, and sometimes vomit. [...] Furthermore, the material used [to produce plastic] in this factory is [plastic] waste from the city that is brought into our village. We strongly urge the government and the environmental bureau to relocate this factory that negatively influences people's health and livelihood. (Reconstructed extract of letter originally sent to officials in 2011 and 2012.)

During years of escalating complaints, the factory owner occasionally sent groups of men to directly threaten the W brothers and their families, and government officials warned the brothers that they were “working against the unity [of the people]” and “against [social] stability.” These are, as we know from other cases of protests in China, serious allegations for any peasants engaged in protests, but due to Mr W's and his brothers' high personal status and considerable clan- and community-support, no further steps were taken by the government or the factory manager. It was too important that emotions and reactions be contained and mass incidents prevented. By 2013, it was clear that the factory was also polluting the local water reservoir to the extent that fish belonging to a recently opened contract fish farm were dying. The manager of this private fish farm happened to have a close relative in an important position in the local government, and thus he used his own informal channels to bring a complaint. Finally, in 2014 the government ordered the factory to relocate.

In sum, resistance to the plastics factory was a prolonged process of protesting through formal channels to higher levels of government combined with local negotiations with officials. It succeeded in the end, mainly because a private contractor with direct family connections in the local government eventually became involved. During the process of protesting, activists developed a competence in “rightful resistance,”⁴⁴ while consciously drawing on science and rationality to promote non-confrontational methods. Like the other three cases discussed below, the plastics factory protests show how multiple forms of dependence – such as workplace, homeplace identity, clan, and vertical relationships between residents and officials – produce particular practices and responses to pollution.⁴⁵

44 O'Brien and Li 2006.

45 See Lora-Wainwright et al. 2012, 113.

Brick factory A: shared vertical interests

Brick factory A was established during the Cultural Revolution in 1975 as a collective enterprise belonging to all the three villages of our study. Its managers up to the early 1990s had been locals, and workers had been also mainly local. At the height of its production in the 1980s, it had more than a hundred employees, and there were seemingly no public discussions or complaints at the time about air pollution from this (or any other) factories. In the early 1990s, business started to slow down and the collective land and factory were contracted (*chengbao* 承包) by four consecutive managers, all from Quzhou. Interviewees recalled that while they were aware of the air pollution from this factory, they choose to overlook this because it was started as a collective village enterprise, and even when it was later operated as a private enterprise, all three villages profited economically from rent of the land and income received by local workers. Moreover, it was only after 2009/2010 with the establishment of the plastics factory that villagers began seriously to worry about air pollution.

By 2010, villagers observed to their satisfaction, as several recounted, that the local government was required by new environmental regulations to close down small-scale (and technologically backward) coal burning factories. They did not need to put much effort into protesting against air pollution from brick factory A because the government, at this time, already had this in sight. Brick factory A had, for a long time, not been profitable, was technologically backward, and no longer had support from the locals, whose economy now made it possible for them not to need to work in such small and dirty factories. The interest of the government was shared by villagers, village cadres, and even to some extent by the factory contractors, who would in any case receive a certain amount of financial compensation for closing down an unprofitable business. Thus, the dismantling in 2014 of brick factory A was an environmentally friendly move that incited no public protest and helped fulfil the government's quota of small polluting factory shutdowns.

However, immediately following the closure of factory A, new plans for using the factory's land came under scrutiny, as villagers discovered that the local government was considering contracting it to a manager coming from "outside" to set up a stone-crushing enterprise. Again, the issue of scientific reasoning as a means of protesting came up, exemplified in a comment from one of the male villagers living close to the factory:

For sure, a factory producing even more dust will also have an even worse impact on people's health. But, really, what kind of impact? What exactly is the composition of this kind of dust? Does the law require an environmental assessment before starting this kind of factory? What should that be based on? We [the villagers] don't know! Could you please provide us with some scientific evidence (*kexue yiju* 科学依据) so when the time comes we can argue on the basis of reason? Then we can avoid causing the government unreasonable trouble while still pushing the manager out of here.

Pursuing scientific arguments and using them as a basis for reasoning and negotiating for a better environment was the tool some villagers preferred to work

with in order to avoid running into conflicts with the government. The villagers most active in the protest preferred to approach the local officials as allies, while being willing to more directly confront the managers of private enterprises, who they felt had nothing but pollution to offer the community.

Brick factory B: technological compromise

Brick factory B was started as a private enterprise in 2003 on the main road leading into J-village, but on land rented from all three villages. Its first three managers were from Fujian province. They hired local workers and engaged residents to transport bricks in private trucks. Thus, initially, the benefits from the factory outweighed the costs for the villagers. This gradually changed. By the time the third manager took over in 2009 there were no longer any local villagers interested in taking up the relatively dirty and poorly paid work in brick factory B, and only eight families continued to make a good income from private transportation for the factory. By this time, villagers from J-village had started to complain, and eventually they began protesting against the factory's air pollution. Smoke from the chimneys was blowing directly into the houses of J-village and on several occasions groups of villagers broke into the factory area throwing water onto the kilns to try to hamper production.

The village head (*cunzhang* 村长) eventually assisted villagers in going to the township government and complaining, because, as he explained to us, “making trouble (*naoshi* 闹事) wouldn't do, because in the end you anyway need the government to solve the problem.” According to the village head, there was a real risk that protests might develop into larger mass incidents. It was therefore a welcome change for local cadres and villagers alike when, in 2013, a new local manager from Quzhou took over factory B. The manager was familiar with the area and good at building connections (*gao guanxi* 搞关系); he agreed to negotiate with villagers and local township officials. They eventually agreed that the manager should invest, with some compensation from government, in higher chimneys and better technology. Although the factory was clearly still contributing to local air pollution, villagers were satisfied with the fact that their efforts had led to the introduction of new technologies and to chimneys that blew the smoke further away. Also, it should be added that the more than 30 immigrant workers who lived in the factory were not involved in these negotiations at all. They had migrated from poorer areas of Guizhou and had no contact at all with the local villagers. Because electricity was cheaper at night, they always worked in night shifts, and environmental bureaus only conducted emission inspections during the day. These workers emphasized that they found air pollution to be a problem only for permanent residents, not for themselves being migrants with no intention of settling permanently in the village.

In sum, brick factory B was an interesting case of confrontational protests that eventually evolved into negotiations. Villagers trusted technological

advancements as a main method to improve the air without compromising the government's ambition of promoting local industry. The factory continued to burn coal immediately adjacent to the village, but villagers refrained from further protests.

Industrial zone tile factory: a lost cause for protesters

Three kilometres from the three villages was the township industrial zone, with about 50 factories producing tiles, packaging material, textile, furniture, etc. This was a prestigious industrial zone managed by the township government that had begun investing heavily since 2007 in its establishment. The first factories started operating in 2009. In 2010, villagers started to protest against two major tile-producing factories, and they collected information about the ill effects they believed they were suffering because of the air pollution. Five years into the protests, we talked to a female peasant in her late fifties, who pointed out the chimney of one of the tile factories from her house, explaining:

Mrs A: This factory certainly does not live up to the required environmental standards!

Authors: But when it started up it was meeting those standards?

Mrs A: Yes for sure. If not, it would not have been allowed to open. [...] It was burning coke (*shao jiaotan* 烧焦炭) which does not create this kind of smoke.

Authors: What do you mean? Why is there less smoke from this factory when they use coke?

Mrs A: Coke has been refined (*tilianguo* 提炼过) so the sulphur dioxide (*eryanghualiu* 二氧化硫) has been removed. [...] The smoke still contains some sulphur but the density is much lower.

Authors: So now ...?

Mrs A: We suspect that they no longer use coke but "stone coal" (*shimei* 石煤)⁴⁶ and maybe even garbage. Because the smoke is black and really stinks. [...] So this factory probably has to improve its technology. It has to burn gas [...] that is, the kind of liquefied gas (*yehuaqi* 液化气) and natural gas (*tianranqi* 天然气) that we already have here.

Mr K from J-village was a key person in the protests against these factories. According to his wife and neighbours, he spent about 20,000 yuan making protest phone calls, procuring assistance to write convincing letters of complaint, and travelling to the seat of the provincial government and even to Beijing several times in 2011 and 2013 to formally submit his complaints on behalf of villagers. A number of villagers backed him in the initial phase when grievances against the two tile factories were numerous. However, although Mr K was a native of

46 The term "stone coal" was used by the interviewee (and other villagers) to describe coal that was not shining but looked like stone and was known to be more polluting. The common term for the kind of coal they suspected the factory used would be lignite or brown coal (*hemei*).

J-village and therefore “a local,” in the eyes of fellow villagers, he belonged to a small clan (*xiaoxing renjia* 小姓人家) and did not enjoy the clan status and social respect that the four brothers who had been leading protests against the plastics factory had. After years of complaining, officials started to describe Mr K as crazy (*shenjingbing* 神经病) and he received threats from thugs who were most likely hired by the factory managers. While some villagers talked about Mr K as a brave and sympathetic person, few if any were willing to follow him in his continued protests, and some argued that he even made it more difficult for others to formally, and rationally, complain and negotiate improvements. He was riding solo (*danqiangpima* 单枪匹马), and by 2015 he had come under such pressure from officials and factory managers that he had moved out of the province. His wife stayed on in the village but urged us, as a research team, to not contact him again.

This, however, did not stop other villagers from making phone calls to the environmental bureau each time heavy air pollution from the tile factories in the industrial zone was experienced. So by the Chinese New Year of 2015, the local government called a meeting for negotiation (*xietiaohui* 协调会) with village cadres, former village cadres, and managers of the polluting factories.⁴⁷ During the meeting, the managers eventually promised to make technological improvements and reduce the use of coal in their production. Eighteen months later, villagers insisted in interviews that nothing yet had happened.

Arguably, these individual and sporadic protests against pollution from the industrial park were doomed to fail because of the prestige of the government-sponsored industrial zone. On the other hand, officials recognized that there might be an illegal emission of pollutants, and promised that in due time the problem would be solved and factories would meet the required standards. Protests were successfully contained because the vast majority of villagers were unwilling to support an individual (Mr K) who was seen to overstep the invisible borders of what was considered to be a rational and therefore acceptable form of activism. Equally important, villagers realized that the target of these protests was protected by intertwined industrial and local government interests. Without substantial scientific evidence of illegal air pollution backing their protests, villagers concluded that “there was nothing they could do” (*mei banfa* 没办法).

Conclusion: Air Pollution and Local Interpretations of a National Imaginary

The case of the three villages discussed in this article shows how people do not react against threats of air pollution as such, but rather to threats of air pollution coming from certain sources and under certain conditions. There is hardly any

47 This meeting may be interpreted as a smaller (rural) but comparable version of the dialogue meetings discussed in the article by Ahlers and Shen 2017 (this issue).

doubt that women cooking on stoves using firewood might experience some discomfort from the smoke, or that neighbours to households emitting wood smoke out of a low chimney next to their windows, will be affected by it. Scientists have sufficient data to prove that air pollution from the use of biomass fuel in households is a major health concern,⁴⁸ and yet villagers in our study insisted that household air pollution was not a risk to them. They were not aware of the reality of household air pollution, probably because it plays a very peripheral role in the current discourse on air pollution in Chinese media and political documents; and they were not really interested in it either because they felt that much bigger issues beyond their control of air pollution from industrial sources were at stake. At the same time, ambient air pollution was clearly perceived as a major threat by villagers but, as shown to be the case in many other studies, a range of complex factors determined whether they would choose to react on it, passively ignore it, or actively accept it as one of many environmental risks they needed to live with.⁴⁹

We suggest that the cases of activism in the villages we studied can be seen as examples of “containable protests.” They were small-scale, localized and not of interest to media or non-governmental organizations (NGOs). They were characterized by a very loose form of organization with no clear or self-recognized leadership. Rather than being examples of actual resistance against government, they were diplomatic in form. Protesters searched for, and sometimes achieved, support from officials when confronting industry management. When that support was not available (as in the case of the industrial park), people retreated and refrained from collective protests. The people most engaged in protests were eager to employ what they saw as objective scientific arguments so that they and their actions would be seen as rational rather than emotional. However, had a larger and more unified group of villagers felt sufficiently threatened by air pollution and been unable to escape by simply moving away (as some decided to do), the protests could possibly have developed into forms of “isolated activism,” described as activism lacking any help from government or NGOs, with people unable to establish the legality of their claims, and sometimes, turning to violence.⁵⁰

The protests and reactions to sources of air pollution that we observed were, on the contrary, justified by the political imaginary of Ecological Civilization that aims at a heightened “environmental consciousness” (*huanbao yishi* 环保意识) of the whole population while stressing the need for promoting rational/legal and scientific approaches in a spirit of harmony and social stability. Groups of villagers, and sometimes individuals, turned against the form of air pollution that had received the most attention in media and policy documents, namely industrial air pollution, and put their efforts into protesting against those sources of air pollution that for social, economic and political reasons seemed most

48 E.g. Aunan, Hansen and Wang 2017 (this issue).

49 Lora-Wainwright et al. 2012.

50 van Rooij 2010, 76.

realistic to target. The interaction, and sometimes cooperation, between village officials, township officials and villagers with a high local social status played a key role in all the protests, and we suggest that this may be a characteristic of containable forms of environmental protests in rural areas of China. Compared to their urban counterparts, who are more likely to receive support and attention from environmental NGOs,⁵¹ villagers had to rely on the local cadres, and the most active protesters were often connected to these cadres through lineage or community relations. Finally, due to the state's intensification of the aim to promote a greener form of governance, projected through the imaginary of Ecological Civilization and translated into new concrete requirements on officials, villagers and officials seem to share more environmental interests now than they had done only five to ten years earlier. Patterns of activism in the villages we studied were complicit in the local government's aims,⁵² and both the local government and the villagers could now legitimize their environmental actions and responses within the stronger national urge to become "ecologically civilized" without disturbing social stability. The politically initiated imaginary of Ecological Civilization has arguably helped, whether intentionally or not, to further legitimize environmental activism in rural areas, as long as it is based in science, localized and limited to a small group of people.

Acknowledgement

Research for this article and the Airborne project was generously supported by the Research Council of Norway and the Centre for Advanced Studies, Norway.

Biographical notes

Mette Halskov Hansen is professor in modern Chinese society and politics at the University of Oslo, Norway. She has published on topics such as ethnic identity, colonization of border areas, and individualization in Chinese society. During years of fieldwork in rural China she became increasingly interested in how people understand and respond to risks of pollution, what they expect from government, and how they envision their future. Recent publications include the monograph *Educating the Chinese Individual* (University of Washington Press, 2015).

Zhaohui Liu is associate professor in anthropology at Zhejiang University, China. His research has mainly focused on grassroots protests, rural communities, cultural heritage, and local perceptions of environment. He is the main editor of a forthcoming Chinese anthology about the human dimensions of air pollution in China.

51 See, e.g., Johnson 2013.

52 Lora-Wainwright 2012, 122.

摘要: 这篇文章把乡村环保行动置于中国政府推进的“生态文明”建设的大背景下进行研究。我们认为,“生态文明”建设是一种自上而下的对未来中国发展的“国家想象”,它把环保抗争有效地纳入到科学发展和社会稳定的制度框架里,更重要的是,为环境保护行动打开了一个新的空间。文章从抗争方式、时间选择和原因诉求等方面,通过对浙江省多个村落的村民进行调查,比较研究他们十年来面对不同的空气污染源,与地方官员、工厂老板协商阻止和缓解空气污染的环保抗争及其行动结果。我们发现,除了“依权抗争”之外,在与官方和老板协商过程中,村民运用科学知识的能力成为他们成功的重要手段。我们建议,环保行动中的“包容抗争”方式可能更利于实现由国家发起的生态文明建设“国家想象”的愿景。

关键词: 关键词; 乡村抗争; 空气污染; 环境意识; 生态文明; 社会技术想象; 民众科学观

References

- Ahlers, Anna L., and Mette Halskov Hansen. 2017. “Air pollution: how will China win its self-declared war against it?” In Eva Sternfeld (ed.), *Routledge Handbook of China's Environmental Policy*. London: Routledge.
- Ahlers, Anna, and Yongdong Shen. 2017. “Breathe easy? Local nuances of authoritarian environmentalism in China's battle against air pollution.” *The China Quarterly*, special section “Human dimensions of air pollution in China.”
- Aunan, Kristin, Mette Halskov Hansen and Shuxiao Wang. 2017. “Introduction: air pollution in China.” *The China Quarterly*, special section “Human dimensions of air pollution in China.”
- Bonneuil, Christophe, and Jean-Baptiste Fressoz. 2016. *The Shock of the Anthropocene: The Earth, History and Us*. London: Verso.
- Central Government of the People's Republic of China. 2013. *Daqi wuran fangzhi xingdong jihua* (Action plan on prevention and control of air pollution). http://www.gov.cn/zhengce/content/2013-09/13/content_4561.htm. Accessed 1 November 2016. English translation: www.cleanairchina.org/file/loadFile/27.html. Accessed 1 November 2016.
- Deng, Yanhua, and Guobin Yang. 2013. “Pollution and protest in China: environmental mobilization in context.” *The China Quarterly* 214, 321–336.
- Duara, Prasenjit. 2014. *The Crisis of Global Modernity: Asian Traditions and a Sustainable Future*. Cambridge, MA: Cambridge University Press.
- Eriksen, Thomas Hylland. 2016. *Overheating: An Anthropology of Accelerated Change*. London: Pluto Press.
- Fan, Bainai, Duan Zhongxian and Jiang Lei. 2013. “Zhongguo zizhu chuangxin zhengce: yanjin, xiaoying yu youhua” (China's policy of self-determined innovation: The developments, effects, and improvements). *Zhongguo keji luntan* 9, 5–12.
- Geall, Sam. 2015. “Interpreting ecological civilisation, parts 1–3.” *Chinadialogue* 7 June, <https://www.chinadialogue.net/article/show/single/en/8018-Interpreting-ecological-civilisation-part-one->. Accessed 15 March 2016.
- Grano, Simona. 2016. “China's changing environmental governance: enforcement, compliance and conflict resolution mechanisms for public participation.” *China Information* 30(2), 129–142.
- Hathaway, Michael J. 2013. *Environmental Winds Making the Global in Southwest China*. Los Angeles: University of California Press.
- Jasanoff, Sheila. 2015. “Future imperfect: science, technology, and the imaginations of modernity.” In Sheila Jasanoff and Sang-Hyun Kim (eds.), *Dreamscapes of Modernity: Sociotechnical Imaginaries and the Fabrication of Power*. Chicago: University of Chicago Press, 1–34.

- Jasanoff, Sheila, and Sang-Hyun Kim. 2009. "Containing the atom: sociotechnical imaginaries and nuclear power in the United States and South Korea." *Minerva* 47(2), 119–146.
- Jing, Jun. 2000. "Environmental protests in rural China." In Elizabeth J. Perry and Mark Selden (eds.), *Chinese Society: Change, Conflict and Resistance*. London: Routledge, 143–160.
- Johnson, Thomas. 2013. "The health factor in anti-waste incinerator campaigns in Beijing and Guangzhou." *The China Quarterly* 214, 356–375.
- Lelieveld, J., J.S. Evans, M. Fnais, D. Giannadaki and A. Pozzer. 2015. "The contribution of outdoor air pollution sources to premature mortality on a global scale." *Nature* 525(7569), 367–371.
- Liu, Jun. 2013. "Mobile communication, popular protests and citizenship in China." *Modern Asian Studies* 47(3), 995–1018.
- Li, Lianjiang. 2010. "Rights consciousness and rules consciousness in contemporary China." *The China Journal* 64, 47–68.
- Li, Hongtao, and Rune Svarverud. 2017. "When London Hit the Headlines: Historical Analogy and the Chinese Media Discourse on Air Pollution." *The China Quarterly*, special section "Human dimensions of air pollution in China."
- Li, Xiaoyue, and Bryan Tilt. 2017. "Perceptions of quality of life and pollution among China's urban middle class: the case of smog in Tangshan." *The China Quarterly*, special section "Human dimensions of air pollution in China."
- Lora-Wainwright, Anna. 2009. "Of farming chemicals and cancer deaths: the politics of health in contemporary rural China." *Social Anthropology* 17(1), 56–73.
- Lora-Wainwright, Anna. 2013. "Introduction. Dying for development: pollution, illness and the limits of citizens' agency in China." *The China Quarterly* 214, 243–254.
- Lora-Wainwright, Anna, Yiyun Zhang, Yunmei Wu and Benjamin Van Rooij. 2012. "Learning to live with pollution: the making of environmental subjects in a Chinese industrialized village." *The China Journal* 68(July), 106–124.
- Ministry of Environmental Protection. 2015a. "Guowuyuan bangongting guanyu jiakuai zhuanbian nongye fazhan fangshi de yijian" (Opinion of the State Council's General Office on how to accelerate the transformation of agricultural development) http://www.mep.gov.cn/ztbd/rdzl/gwy/wj/201508/t20150807_307890.html. Accessed 15 March 2016.
- Ministry of Environmental Protection. 2015b. "Guanyu shenru tuijin nongcun shehui jianshe shidian gongzuo de zhidao yijian" (Guiding views regarding the work to push forward pilot projects constructing countryside communities) http://news.xinhuanet.com/fortune/2015-05/31/c_1115463822_2.html. Accessed 15 October 2016.
- Ministry of Environmental Protection. 2015c. "Shengtai wenming tizhi gaige zongti fang'an" (The general scheme for the structural reform of Ecological Civilization) http://www.mep.gov.cn/zhxx/hjyw/201509/t20150922_310133.html. Accessed 15 March 2016.
- O'Brien, Kevin J., and Li Lianjiang. 2006. *Rightful Resistance in Rural China*. Cambridge, MA: Cambridge University Press.
- O'Brien, Kevin J., and Yanhua Deng. 2015. "Repression backfires: tactical radicalization and protest spectacle in rural China." *Journal of Contemporary China* 24(93), 457–470.
- Office for the Population Census of Zhejiang. 2012b. *Zhejiang sheng renkou pucha ziliao* (Tabulation on the 2010 Population Census of Zhejiang province) vol. 1, 5. Hangzhou: China Statistics Press.
- Oswald, James P.F. 2016. "What does eco-civilisation 生态文明 mean?" *The China Story Journal*. <http://www.thechinastory.org/2014/09/what-does-eco-civilisation-mean/>. Accessed 14 March 2016.
- Pang Qinghua, Pan Linlin and Zhao Yijing. 2016. "Shengtai wenmin linian ruhe zou xiang shijie – zhuanfang IUCN Zhang Xinsheng" ("How the idea of Ecological Civilization becomes global – an interview with Zhang Xinsheng from IUCN." *Zhongguo Wangshi* <http://xhpfm.mobile.zhongguowangshi.com:8091/v210/newshare/1177400?channel=>. Accessed 18 October 2016.
- Perry, Elizabeth J. 2009. "China since Tiananmen: a new rights consciousness?" *Journal of Democracy* 20(3), 17–20.
- Sawyer, Jon. 2015. *Ecological Civilization: Proceedings, International Conference on Ecological Civilization and Environmental Reporting*. Beijing: Yale Center Beijing.

- Schmitt, Edwin. 2016. "The Atmosphere of an Ecological Civilization: A Study of Ideology, Perception and Action in Chengdu, China." PhD diss., Chinese University of Hong Kong.
- Shapiro, Judith. 2012. *China's Environmental Challenges*. Cambridge, UK: Polity Press.
- Steinhardt, H. Christoph, and Fengshi Wu. 2016. "In the name of the public: environmental protest and the changing landscape of popular contention in China." *The China Journal* 75, 61–82.
- Stern, Rachel E. 2013. *Environmental Litigation in China: A Study in Political Ambivalence*. Cambridge: Cambridge University Press.
- Tilt, Bryan. 2006. "Perceptions of risk from industrial pollution in China: a comparison of occupational groups." *Human Organization* 65(2), 115–127.
- Tilt, Bryan. 2013. "Industrial pollution and environmental health in rural China: risk, uncertainty and individualization." *The China Quarterly* 214, 283–301.
- Tilt, Bryan. 2014. *Dams and Development in China: The Moral Economy of Water and Power*. New York: Columbia University Press.
- Van Rooij, Benjamin. 2010. "The people vs. pollution: understanding citizen action against pollution in China." *Journal of Contemporary China* 19(63), 55–77.
- Wang, Alex. 2013. "The search for sustainable legitimacy: environmental law and bureaucracy in China." *Harvard Environmental Law Review* 37(2), 365–440.
- Xie, Lei. 2016. "China's changing environmental governance: enforcement, compliance and conflict resolution mechanisms for public participation." *China Information* 30(2), 188–208.
- Yang, Baoguo. 2004. "Lun dang de di san dai lingdao jiti dui Deng Xiaoping kejiao xingguo zhanlüe sixiang de chuangxin yu shixian" (A discussion of the third generation Party leadership group's creations and practices related to Deng Xiaoping's strategic thoughts on "strengthening the state through science education"). *Journal of Jiangnan University* 3(6), 9–12.
- Yang, Fan. 2016. "Under the Dome: 'Chinese' smog as a viral media event." *Critical Studies in Media Communication*. <http://dx.doi.org/10.1080/15295036.2016.1170172>. Accessed 12 October 2016.
- Yang, Guobin, and Craig Calhoun. 2007. "Media, civil society, and the rise of a green public sphere in China." *China Information* 21(2), 211–236.
- Zhao, Changwei. 2003. "Deng Xiaoping kejiao xingguo sixiang yanjiu" (Research on Deng Xiaoping's thoughts on "strengthening the state through science education"). *Zhengzhi yanjiu* 2, 74–82.
- Zhejiang Statistics Bureau. 2014. *Zhejiang Statistical Yearbook 2014*. Hangzhou: China Statistics Press.
- Zhong, Yang, and Wonjae Hwang. 2016. "Pollution, institutions and street protests in urban China." *Journal of Contemporary China* 25(98), 216–232.
- Zhou, Enlai. 2013 [1956]: "Guanyu zhishifenzi wenti de baogao" (A report on issues regarding intellectuals). *Renmin ribao*, 30 January. <http://cul.qq.com/a/20130608/000499.htm>. Accessed 14 October 2016.