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Expulsion by pollution: the political economy of land grab for industrial parks in rural China

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ABSTRACT

This paper aims to broaden the analysis of the social-ecological impact of land grab. It does so by examining a hidden form of dispossession – expulsion by pollution within the context of industrial transfer inside China. Expulsion by pollution is different from the land dispossession described in most land grab studies as it involves expelling people from their land by reducing its use value through pollution, rather than taking the land away. Based on a case study in China, this paper explores the dynamics, mechanisms and impacts of expulsion by pollution. It finds that the alliance of developmentalist government and private capital has not only provided political space for pollution to occur but also limited the space for local villagers to resist its environmental impacts. The poor bear the heaviest brunt of the negative impact of pollution and in the most vulnerable situations.

KEYWORDS

Industrial transfer; expulsion by pollution; environmental struggle

1. Introduction

In the current literature on land grab, land dispossession is often represented as the process through which peasants are separated from their land by extra-economic coercion or economic means and involves a shift in control over land from the hands of peasants to more powerful actors (Andreas & Zhan, 2016; Hall, 2013; Harvey, 2003; Levien, 2013; Marx, 1887; Mehta, Veldwisch, & Franco, 2012; Xu, 2018). However, in this paper we argue that this framing of land dispossession is problematic in two aspects. Firstly, it obscures an invisible form of land dispossession in which people still maintain control of their land but its use value is damaged by pollution. This kind of indirect land dispossession could lead to expulsion, not due to the direct loss of control over land but by it being rendered useless by pollution. Secondly, this framing mainly focuses on changes in control relations that occur around grabbed land and overlooks how the use of grabbed land affects relationships between people and agroecosystems, which further shapes land dispossession beyond direct land grabbing, both spatially and temporally (Schneider, 2014). This neglect can easily lead to an underestimation of the scale and consequences of land grabbing. Since the environmental impact of land grabs may extend beyond the issue of land tenure, it is necessary to incorporate socio-ecological impacts into our understanding of how land grabs are constituted and their effects.

To broaden the discussion on land dispossession and to better understand how land grab affects people's lives, this paper focuses on an invisible form of dispossession – expulsion by pollution. Expulsions are 'made' while their character and content vary in different contexts (Sassen, 2014).

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In this paper, expulsion by pollution occurs after the transfer of land from agricultural to industrial use and refers to a hidden form of dispossession which does not result in people's direct loss of control over the land and water, but driving people away from their land and homes as a result of pollution through reducing the use value of land and water. By introducing the topic of expulsion by pollution, this paper highlights the need for more investigations into how grabbed land use exerts environmental impacts on people beyond the scale of grabbed land *per se* and after the land acquisition, how affected villagers respond to the environmental impacts and the implications for rural transformation.

This article uses a case study from G Village in B Township of Y County in J Province[1] of China to illustrate the dynamics, mechanisms and impacts of expulsion by pollution. The analysis is based on an extensive set of primary data collected from fieldwork during July and August of 2016, including 13 in-depth interviews with villagers, including village heads and left-behind children and elderly[2] in G Village and officials at both township and county levels. The interviews with local officials loosely followed three main topics: land appropriation for an industrial park, the development planning of the industrial park and the impact of industrial pollution on the local community. Interviews with village heads and villagers concentrated on how they perceive the land appropriation for the industrial park and how they have responded to the problems caused by industrial pollution. Observations drawn from the fieldwork and secondary data (collected reports, official statistics and academic articles) are employed to strengthen the analysis.

The remainder of this paper is organized as follows: the next section introduces the background of industrial transfer inside China and land grab for industrial parks, which provides the context of expulsion by pollution; the third section focuses on the dynamics of expulsion by pollution (how villagers resist industrial pollution and how pollution triggers expulsion); the fourth section explores the mechanisms and impacts of expulsion by pollution. We conclude with a summary and some policy and research recommendations.

2. Background: industrial transfer and land grab for industrial parks

This section introduces a brief background to industrial transfer inside China and examines how it has shaped land use and environmental change in Y County, thus providing the context of how expulsion by pollution emerges.

2.1. Industrial transfer within China

Industrial transfer inside China is the result of the migration of capital and investment from the wealthy coastal region into poorer central and western regions, which has been happening since the early 2000s (Ang, 2018). The industries that shift are mostly 'backward', 'low-end', and 'polluting' industries that are being expelled by the coastal areas (Ang, 2018; Luo, 2010). Since the early 2000s there has been a rapid growth in interregional industrial transfers. It is estimated that the value of interregional investment in the five central provinces of Jiangxi, Henan, Hunan, Hubei and Anhui increased from 836 billion yuan in 2008 to 3760 billion yuan[3] in 2015 (Ang, 2018).

There are two main drivers behind this massive industrial transfer. The first is governmental support. At a national level, industrial transfer is seen as a way of reducing disparities between the coastal and central regions, which have widened since market reform (Yu, 2014). To promote economic growth in the central and western regions, the Chinese government introduced 'The Western Development Program' in 1999 and the 'Rise of Central China Plan' in 2004. In 2010, with the issue

of 'Guiding Principles on Industrial Transfer to the Central and Western Regions' by the State Council, industrial transfer became a national development strategy. Local governments, from the provincial level to the county level in inland regions, embrace industrial transfer as a way of enhancing local economic development and generating new sources of tax revenue (the later especially after the tax reform in 1994 and the abolishment of agricultural tax in 2006). In addition, local growth in GDP is an important criterion for civil servants to advance their official careers, and this means that local officials at a lower level can face pressure from those at a higher level in the bureaucratic structure, especially when investment attraction is assigned as a 'political task' (Andreas & Zhan, 2016). To attract investors, local governments often provide favourable relocation packages, including subsidies, tax breaks, bank loans, access to land and loose regulations.

The second driver is the search of capital based in the coastal region, under cost and policy pressures, for new spaces for accumulation. Confronted with increases in the cost of land and labour and intense market competition, relocating to inland regions where land and labour costs are much lower than that in coastal regions is attractive for investors. At the same time, in order to promote economic restructuring, many coastal governments have implemented policies to expel low-end and polluting industries, using both economic and extra-economic means, to exert policy pressure especially to 'low-end' manufacturers (Ang, 2018).

These industrial transfers and relocations have triggered land use changes and environmental problems in central and western regions. One prominent feature of this is the rise of industrial parks. In the following section we look at the example of Y County in J Province to illustrate how land is acquired for industrial parks and the environmental impacts of this.

2.2. The scale and pace of the development of industrial parks: the case of Y County in J Province

J Province is located in the central region of China. Until 2003 the agricultural sector was the main pillar of J's economy. To promote industrial development, during the 11th Provincial Congress of the Communist Party in 2001, the J government initiated a strategic planning called 'Three Bases and One Garden' (*san ge ji di, yi ge hou hua yuan*). 'The Three Bases' refers to: (i) an industrial base built up through receiving industries that have transferred from the coastal areas; (ii) a high-quality agricultural products base; and (iii) a base for migrant labour to the coastal regions. 'One Garden' refers to the development of a tourist industry. Facilitated by government support, the industrial sector has grown very quickly and in 2003 its output exceeded that of the agricultural sector for the first time, thus becoming the major engine for J's economic growth (Zhang, 2006). Industrial parks, which are special zones designated and planned by government for receiving investments, have played a major role in this. From 2001 to 2008, the industrial value-added output of industrial parks realized about a 27-fold increase (Song, 2012). The fast pace of industrial development in J Province has attracted widespread attention in China.

Y County is in central J Province. The planning of industrial parks in Y County can be traced back to 1997. To date, three industrial parks have been built, one each in the northern, southern and western parts of Y County. By 2013, there were 165 private companies located in these industrial parks, two of which have been listed in Hong Kong and South Korea respectively. In 2013, the total revenue generated on these three industrial parks amounted to 18.3 billion yuan and contributed 0.92 billion yuan in tax revenue for the Y government. The main industries in the industrial parks are the production of calcium carbonate, nonferrous metals, pharmaceuticals, and processed

food. The first two of these are the main pillars, accounting for 57.69% of the total business income of industrial parks in 2015.

In 2006 industrial parks in Y County occupied 253.33 ha of land, which almost doubled to 427.39 ha in 2015. Government plans (the Development Planning of Industrial Parks in Y County 2014–2020) envisage a further more than doubling of the size of industrial parks by 2020 to 1033 ha, most of which will be converted farmland and forestland.[4]

To look in more detail at one of these industrial parks: the Western Industrial Park was built in 2008 and is mainly home to nonferrous metals industries that produce zinc, lead, copper and aluminum through recycling electrical waste. The planned area for Western Industrial Park was 128 ha, about 100 ha of which were appropriated from G Village. By August of 2016, 66 ha of this land had already been put into use and five companies had started production, three of which transferred from Zhejiang Province which is on the east coast of China.

2.3. Land grab for industrial parks

There are three mechanisms that define and drive land grab for industrial parks in Y County. Firstly, it is a government-led land acquisition scheme for private investors. It is the local government that appropriates land from villagers for the construction of industrial parks and rents the land to investors with subsidies.[5] The process of land appropriation for the Western Industrial Park was mainly negotiated between the Y government and the village heads of G Village in 2007, with compensation being provided for the appropriated land. Because the land in question was mainly collectively-owned forestland[6], all the compensation was kept by the village committee and invested in constructing a new bridge for the village. Secondly, this land acquisition didn't result in dispossession *per se*. Since the land appropriated for the industrial park was collectively-owned forestland, the villagers still maintained their control over their farmland and their ability to generate an agricultural income. Thus, the transfer of land did not separate villagers from their land. Finally, and worth noting, there was no resistance against the transfer of land. The villagers looked forward to the construction of the industrial park, expecting it to generate off-farm job opportunities, which is especially important as farming on the small patches of land that households own does not generate enough income to support peasant households in an increasingly commodified economy since market reform (Bernstein, 2010). One former village head recalled most people were quite happy about the industrial park and thought *it was a good thing*.[7] Yet at the same time, no one had a clear idea about what kind of factories would come and what they would produce until the investors actually arrived.

According to a local official of township government[8], nonferrous metal production was supposed to be confined to the Southern Industrial Park. But this is close to many newly-built residential communities and to minimize the population affected by industrial pollution, it was considered to *better to put polluting industries in a sparsely populated area*.[9] This led the plan to relocate the nonferrous metals producers to the Western Industrial Park, where *there are only several rural households around*.[10] In reality there are three villages close to the Western Industrial Park. G Village which has 426 households is the closest, just 800 m away from the Park, with the nearest villagers' houses being less than 500 m away from the factories. The transfer of the nonferrous metal industries to the Western Industrial Park actually is the *second* transfer of pollution from urban to rural areas, with G Village now seriously adversely affected by industrial pollution.

Although land acquisition for the industrial park has not resulted in land dispossession, the factories in the industrial park have had an impact on local people and local ecosystems that extends far

beyond the scope of appropriated land, mostly through gaseous and aquatic emissions. According to the Development Planning for Western Industrial Park (2014–2020) (hereafter The Planning) made by Y government, all four non-ferrous metal factories in the Western Industrial Park emit sulfur dioxide, a combined total of 310 tons per year[11], which not only has exceeded local environmental capacity but also triggered the withering of surrounding trees and crops. Besides, not all of the factories have been able to implement industrial waste water recycling as noted in The Planning. Since non-ferrous metal factories mainly produce zinc, lead, copper and aluminum through recycling electrical waste, the waste water discharged by factories without treatment might contain heavy metals which could pose a severe threat to local ecosystem. It was not possible during the fieldwork to collect data about the scale or severity of industrial waste water discharges but anecdotally many villagers we interviewed reported observing industrial waste water leaking into their field. This issue is also noted in The Planning which records the existence of 'a waste water leakage problem due to the mismanagement of certain factories'.

The following section focuses on how villagers have responded to the pollution, the problems it causes and how this is leading to expulsion by pollution.

3. The dynamics of expulsion by pollution: resistance against industrial pollution

Expulsion by pollution is not the direct result of pollution but is embedded in a hidden dispossession process that is full of conflicts and struggles against the pollution. This section explores the dynamics of expulsion by pollution, how the villagers have attempted to resist industrial pollution and the outcomes of this resistance.

Awareness of pollution is the starting point for environment struggle and closely influences whether those affected will choose to resist, and against whom (Zhu, 2012). For the villagers in G Village, they only became aware of pollution after experiencing its negative effects (Zhang, 2010). Their lack of prior knowledge hindered them from taking preemptive action to stop pollution and reinforced their vulnerable position.

The villagers in G Village did not anticipate any problem with pollution from the nearby non-ferrous metal industries until they found their rice crops withering under the impact of industrial pollution. One villager recalled that in June of 2009, a large area of rice crops in the village suddenly became withered, *the crops looked like they had been sprayed with herbicides. Lots of black spots appeared on the leaves. We had not seen this before.*[12] Concerned villagers consulted technicians based in the township's agro-technical station but they could find no reasons. Later on villagers found more withered crops in the fields close to the factories and noticed that the withering of crops was more severe on rainy and foggy days and less when the factories stopped production. Based on those observations, villagers began to suspect the waste water flowing to their fields and the waste gases emitted by factories might be the main reasons, which further aroused villagers' grievances against factories. Village heads reported the problem to the township government which assigned several agricultural technicians to research the problem. They did some experiments which showed that the factories' waste water did adversely affect rice crops. To ease villagers' grievances, the factories started to provide compensation to villagers according to their yield loss and promised to avoid discharging waste water into their fields in the future.

Nonetheless in the next rice cropping season, three months later, villagers again found their rice crops withered. Several villagers went to the Western Industrial Park and asked the factories to stop production, but their request was ignored. This failure of negotiation inflamed the villagers. What followed was villagers' collective sabotage of the factories. A villager recalled, *one night, almost all*

the villagers went into the industrial park, gathered before the biggest factory and smashed everything in its six-floor office building.[13] The struggle was ended when the police were dispatched to the Western Industrial Park to restore order. Civil servants in local government with social networks in G Village were also asked to go to the scene to persuade their relatives or friends to stop the sabotage. Under the combined pressure of coercive force and relational repression (Deng & O'Brien, 2013), the villagers soon left Western Industrial Park. At the end of September, several villagers who led the sabotage were taken away by the police and detained for several months. Out of the fear of being detained, villagers stopped their struggle through violent means. Soon afterwards the factories, through the mediation of the local government, offered compensation to G Village including 200,000 yuan and a donation of sports and exercise facilities. However, the pollution persisted.

Villagers' grievances against pollution were reinforced when they found that their children's health and their groundwater were both under threat by the pollution. Later in the same year many parents in G Village noticed their children losing their appetite. Physical checks revealed that many children in the village had an elevated blood lead level. According to a test report kept by a villager, 295 children from G Village took the test in 2009 and among these there were 18 with blood lead levels that exceeded 100 μg/L, while the highest reaching 241.2 μg/L.[14] Meanwhile, one villager who was worried about the possibility of the village's drinking water being polluted took a groundwater sample for testing to a laboratory in the capital city of J Province. The villager said the test result showed the local groundwater to be polluted and undrinkable.[15] Thus it triggered a further wave of complaints from the villagers. To ease villagers' concerns, the Y government offered free annual blood lead test for children under 16 years old and free milk for children with a high blood lead level. Although the test are free, villagers have shown no trust in the test results, with some suspecting that the results are falsified. To assuage villagers' complaints and grievances, the local government and the factories offered further compensation to appease the villagers but the pollution still continued.

In China, when villagers lose trust in local government to resolve their problems, they turn to petitioning central government as a last resort (O'Brien & Li, 2006). To stop the pollution caused by the Western Industrial Park, the villagers of G Village have made two petitions. The first petition was in November of 2009. To avoid the attention of local government, just four villagers went to Beijing with documents including pictures of withered crops, reports of children's blood lead level and the water quality test result. After their arrival in Beijing, several local officials from Y County appeared and tried to persuade them to go home. The villagers persisted and finally succeeded in submitting their documents to the State Bureau for Letters and Visits. However, when they returned home, the younger of the four villagers were educated by local officials and required not to make petition again. To attract public support, one elder villager turned to the media for help and contacted a television station. In October 2010 the station broadcast an episode of Social Watch (a documentary), containing a report about the pollution caused by industrial parks. Later that year the villagers received a phone call from Beijing saying that the State Bureau for Letters and Visit had sent instructions to local government to resolve the pollution problem. Shortly afterwards, the Environment Protection Department of Y County organized a meeting with villagers and granted 100,000 yuan to G Village for developing rural infrastructure. In addition, the Y government promised villagers to solve the pollution problem within two years and circulated a printed promise letter in G Village.

In the following two years, industrial pollution was reduced to a certain degree but it still continued. Meanwhile, villagers found that the factories had adjusted their strategy and chose to discharge their waste gases in the middle night. Although the Department of Environment Protection in Y County claimed they were monitoring pollution, the villagers claimed to have witnessed waste gas

being released between 1 am and 3 am. Rice crops in G Village have withered every year since 2009 as a result of the pollution. With grievances against the pollution still fermenting, the villagers organized a second petition in 2013, with each village household donating money to fund the trip to Beijing to deliver the petition. To avoid being noticed by local officials, only elderly villagers, around 60–70 years old, went on the trip. To appease the villagers, the Y government granted another 260,000 yuan to G Village for 'Beautiful Countryside Construction' in 2014. In addition, it has also organized a coordination group to mediate disputes between the factories and the villagers. In a nutshell, the villagers' second petition once again ended with the village receiving compensation but no end to the pollution.

The villagers' ongoing struggle against pollution reveals that they are not passive victims. The village has a strong 'clan culture', with more than 90% of villagers sharing the same family name (Jing, 2009; Tong, 2011) and this has facilitated the villagers' collective mobilization in confronting the polluters. At the same time the villagers have been resourceful in adjusting and switching their resistance strategies to adapt to the socio-political structure in which they are embedded, rather than following a single line of resistance. Finding that the factories were not receptive to changing their behaviour through customary mediation, the villagers first chose violence, then to making petitions to central government and calling in investigative journalists. During the petition process, the weapons of age and attracting media attention were smartly used to improve the chances of success.

In spite of these flexible tactics, structural factors remain a constraint and the chances of the villagers winning their environmental struggle are slim. While the petitions about environmental pollution are heard by central government, the problem is mostly sent back to local government to resolve. Since the interests of the local government and private investors are closely related, this makes it far harder to arrive at an acceptable solution to the problem. This is a major structural obstacle that has thwarted the villagers' environmental struggles and meant that they have met with little success (Zhu, 2013).

4. The mechanisms and impacts of expulsion by pollution

The villagers' failure to stop pollution from the factories has meant that the combined effects of pollution on their water and land create powerful driving forces that are pushing them away from their land and making staying on their land and in their village more expensive and hazardous. In this section we explore three such driving forces: (i) the progressive abandonment of farming; (ii) the transfer of the village's children to safer places to live and study; and (iii) the contamination of groundwater and villagers' diverse strategies for dealing with this.

4.1. The abandonment of farming

Farming in G Village has been badly affected by the gaseous and waste water emissions from the Western Industrial Park. Since 2009, the rice yield in G Village has decreased from 450 to 250 kg/mu. To counteract the yield losses from pollution, villagers have tried using various kinds of fertilizers and pesticides in far greater quantities than before. One villager said helplessly, *since the soil has been contaminated by pollution, we have to save the yield by management (which means the use of more pesticide and fertilizer). Otherwise, the yield does not even reach 250 kg/mu.*[16] Under the double pressure of deteriorating land productivity and the high cost of purchasing agricultural inputs, more and more villagers have abandoned their farmland. During the fieldwork, we found that 10 mu farmland immediately next to the industrial park have been left uncultivated for

several years. Another villager complained, *because of the pollution, we cannot make ends meet by farming. The cost of agricultural inputs is higher but the yield gets less and less. All we can do is to escape and migrate to cities to be labourers.*[17] Before the appearance of the Western Industrial Park, most young people from the village migrated to cities to work as labourers, while the elderly, women and children were left behind at home. Although farming was not enough to sustain a family livelihood, it could provide food, a relatively steady income and a reserve for labourers who could not find stable jobs or settle down in cities (Andreas & Zhan, 2016). However, the pollution has put migrant workers and left-behind families in a more precarious situation by reducing the productivity of the farmland. It further pushes villagers into a process of proletarianization. Even though they still maintain control over the land, the land is less and less useful.

When the land was appropriated for the industrial park, the villagers had expected to get off-farm jobs in the factories. Yet, they have not benefited much from the factories' presence. When the construction of Western Industrial Park started, many young migrant workers in G Village were attracted back, hoping to work close to home and be with their families. However, they soon realized that working inside the polluting factories posed a threat to their health and went back to working in faraway cities. Only a few villagers were involved in the construction of infrastructure for the industrial park and these were short-term jobs. The factories prefer to employ migrant workers from other provinces, to avoid coming into conflict with local villagers, especially after the sabotage in Western Industrial Park.

Without alternative job opportunities from the industrial park, there is now more pressure on villagers to migrate to cities for labouring work, especially as local farming is badly affected by pollution. However, not all villagers in G Village are able to go to a city to look for a job, especially for the elderly. Villagers who have no alternative income source have to continue farming on polluted land to reduce the cost of purchasing food from the market. A 65-year-old villager said,

> Although pollution reduces the rice yield, it is better than nothing. I cannot let farmland remain uncultivated. I have two grandchildren. Their parents are labour workers in cities and do not earn much money. I have to take care of them and send them to school. All those things need money. Farming on polluted land at least saves money for buying rice. I am getting older and older. It is not easy for us to make money.[18]

In short, pollution in G Village is driving the separation between villagers and their land by affecting the productivity of the land and its use value. The ones who have left the land become more locked into commodity relations, with their livelihood depending more on the market, while those who remain have no choice but struggle to grow food on polluted land and are pushed into an ever more vulnerable situation in which both their livelihood and their health are threatened. Many villagers dare not eat the rice that they produce on their polluted land and choose to sell their rice at a lower price and buy rice at a higher price from the market. Thus, the market circulation of rice produced on polluted lands poses a potential health threat that extends to people far beyond G Village.

4.2. Escaping from pollution

When it was found that industrial pollution was leading to high blood lead levels among children and that the pollution couldn't be stopped in the short term, many villagers chose to send their children to schools in Y city[19] or to their relatives' places to escape from the pollution. These children are mostly 'left-behind children' from 2 to 12 years old, under the care of grandparents or relatives.

They used to attend a school in G Village, but according to a retired teacher in G Village only 20 students remained at the village school in 2010–11, and about 100 households had taken their children to schools at Y city. Even in the township's primary school, the number of enrolled students dropped from 1100 to 600 in 2010 as many parents think it is too close to the Western Industrial Park.

Sending children to schools outside G Village is one way to avoid pollution, but not all villagers can afford the cost. The poorer have no choice but to stay and bear the pollution. One left-behind child commented, *only the rich can move to Y city*.[20] There are two ways to get enrolled in public schools at Y city. One is to pay the high 'temporary' schooling fee, an extra charge for non-residents of Y city. Another way is to become an urban household through purchasing an apartment at Y city. In 2016, the cost of buying a house in Y city was around 5000 yuan/m^2 while the average monthly income for migrant workers is around 3359 yuan.[21] Only a few villagers in G Village could afford apartments at Y city. Most villagers have chosen to pay the high temporary schooling fee and rent houses there in order to take care of their children as most public schools at Y city are day schools. This has triggered a second split of left-behind families, with the grandmothers taking care of children in Y city, while the grandfathers are left behind in the village to look after their homes and fields.

Staying in the city to escape from pollution significantly increases the economic burden for most families. During the interview, we often heard people say that *if there was no pollution, no one would send their children to the county school*.[22] Since 2013, many villagers have begun to bring their children back to the village school because the cost of living in Y city is prohibitively expensive. When the interviews were conducted, only 50 households were still staying at Y city and the others had returned to G Village. A 53-year-old grandmother, who was taking care of her two grandchildren in Y city, couldn't help complaining:

> Life there is so hard. Living in Y city needs at least 20,000 yuan for one year. If there was no pollution, we needn't spend so much money. Everything in the city costs money, not to mention the house rent, electricity, water and food. My son and daughter-in-law are just migrant workers and they do not earn much money. We are getting old and can't make money neither.[23]

In addition, the children also have to adapt to a new environment after migrating to Y city. An 8-year-old boy who is attending a county primary school said that he is the only student from the countryside in his class and none of his classmates want to play with him. He often feels lonely at school and plays by himself. His educational performance at the village school was quite good but has become worse at the county school. He said that when he is grown-up he doesn't want to be a peasant (*wo zhang da le bu xiang dang nong min*).[24]

4.3. The replacement of polluted groundwater with bottled water

Groundwater is the main water source in G Village. Almost every household has a well in their yard. In 2009, one villager made a water quality test and said the result showed that the local groundwater was no longer drinkable. He expressed his grievance, *living in the village is like taking poison*.[25] Out of health concerns, villagers dare not drink groundwater and have replaced it with bottled water. Yet, as one villager complained, no one can afford bottled water for all household water demand.[26] Villagers only use bottled water for drinking and still use groundwater for cleaning and cooking. On average a household has to pay at least 20 yuan per month for bottled water. Pollution has created a market space for commodified water in G Village, locking villagers into the necessity of purchasing bottled

water. And the option of buying bottled water to avoid drinking contaminated water is not open to all. Some can afford this 'luxury' but others cannot. During the field visit the authors observed many villagers still drinking groundwater as they could not afford bottled water. Undoubtedly, when faced with pollution, the poor bear the highest health risk.

Although the land appropriation for the Western Industrial Park only directly affected G Village, the fluidity of polluted water, air and to a lesser extent agricultural products mean that the industrial park exerts a negative impact on people's livelihood and health beyond G Village (Arduino, Colombo, Ocampo, & Panzeri, 2012). There are two villages downstream of G Village. Although no land from these two villages was appropriated for the Western Industrial Park, their rice yields have also dropped due to the water and air pollution caused by the factories. Villagers from these two village have complained and claimed compensation for yield loss but have been ignored by the factories, which have argued that they have not used these villages' land. Yet these two downstream villages are bearing the externalities of changed land use for the Western Industrial Park in G Village.

Farming abandonment, sending children away from the village to avoid pollution and purchasing bottled water might at first glance seem like active and voluntary choices made by villagers to have a better cash income, better education for their children or a better quality of drinking water. But a closer look discloses that these are reactions to pollution that is not produced by them. The factories at Western Industrial Park, need land, water and a loosely-regulated spatial environment in order to accumulate capital at a low cost. The industrial pollution released by the factories has become a hidden force of dispossession that expels villagers from their land, water and living environment by reducing their use value. The poor bear most of the negative impacts of pollution and are the most vulnerable as they do not have the resources to protect themselves from these externalities.

5. Conclusions

This paper explores a hidden form of dispossession – expulsion by pollution – as 'another' form of land grab that is happening around industrial parks in the context of industrial transfer inside China. Although land grabbing for industrial parks has not led to a full separation of villagers and their land, the transferred industries are driving villagers away from their land and traditional livelihoods through a combination of air and water pollution. The industrial pollution released from the grabbed land exerts adverse impacts on local communities and reaches far further than the actual loss of land. By raising the issue of expulsion by pollution, this paper calls for more attention to be paid to how grabbed land is used and how it reshapes the relations between people and the agroecosystems on which they depend, relationships that are detrimentally changed beyond the scale of grabbed land, and long after the land deal.

The case of G Village is not isolated and is a microcosm of many other villages that are suffering from industrial pollution in China. Expulsion by pollution is made and embedded in the power interplay between local government, capital and villagers, with the main engine for the rise of industrial parks being economic-centered developmentalist ideology. Although incoming capital makes a contribution to local economic growth, it is at the cost of the livelihoods and the health of local communities. While capital has the ability to look for other new spaces to accumulate profits, it is quite difficult to run away from pollution, especially for the poor. While the villagers are not passive victims and have adopted various resistance strategies, the space for them to struggle and achieve success is confined and shaped by the existing power asymmetry in which local villagers, capital and local government are embedded. If the unequal power structure cannot be altered, the failure of villagers' environmental struggle will be repeated and expulsion by pollution will be reproduced.

List of interviews

1. Interview with GH, a villager in G Village, July 28 and August 1, 2016, Y County.
2. Interview with XK, a villager in G Village, July 29, 2016, Y County.
3. Interview with YH, a villager in G Village, July 29, 2016, Y County.
4. Interview with LX, a villager in G Village, July 29, 2016, Y County.
5. Interview with ZR, a villager in G Village, July 30, 2016, Y County.
6. Interview with SY, a villager in G Village, July 30, 2016, Y County.
7. Interview with DM, a villager in G Village, July 31, 2016, Y County.
8. Interview with ZH, a former village head of G Village, July 31 and August 1, 2016, Y County.
9. Interview with H, an official of B township government, August 1, 2016, Y County.
10. Interview with FX, a villager in G Village, August 1, 2016, Y County.
11. Interview with F, a villager in G Village, August 1, 2016, Y County.
12. Interview with S, a director in Education Bureau of Y County, August 2, 2016, Y County.
13. Interview with W, a director of Industrial Park Administration Committee, August 3, 2016, Y County.

Notes

1. For the privacy of interviewees, the authors replace the real names of the village, township, county and province where the fieldwork was conducted with G Village, B Township, Y County and J Province.
2. The 'left-behind' people refers to the family members (mainly children, women and the elderly) of migrant workers who remain in their rural communities to perform farm labour and look after their homes and remaining family members that is one of the consequences of the massive internal rural-urban migration that has occurred in China since 1980s (Ye, 2011; Ye et al., 2013).
3. At the time of writing 1 Yuan = 0.14 US dollars or 0.13 Euro.
4. Forestland here does not refer to natural forest but land used for tree cultivation. Both the forestland and farmland are collectively owned but the forestland was not contracted to rural households under the Household Responsibility System in the 1980s. Until the Forestland Reform in 2008, the user rights of collectively forestland were formally distributed and verified (Xu, 2018).
5. The cost of renting land in the industrial parks is 64,000 yuan per mu but investors can get a subsidy of up to 44,000 yuan per mu for fixed asset investment. 1 ha is 15 mu. At the time of writing 1 Yuan = 0.14 US dollars or 0.13 Euro.
6. Before the industrial park, forestland in G Village were planted with trees mainly for ecological ends rather than for the market. Villagers did not economically benefit much from collectively-owned forestland. The compensation standard of appropriating forestland was also much lower than that of farmland, so local government preferred to appropriate forestland from surrounding villages. The land transfer did reduce the space and possibility for villagers to diversify their livelihoods by using forestland.
7. Interview with ZH, a former village head of G Village, August 1, 2016, Y County.
8. Interview with H, an official of B township government, August 1, 2016, Y County.
9. Interview with H, an official of B township government, August 1, 2016, Y County.
10. Interview with H, an official of B township government, August 1, 2016, Y County.
11. Based on the assumption of 300 working days per year.
12. Interview with GH, a villager in G Village, July 28, 2016, Y County.
13. Interview with DM, a villager in G Village, July 31, 2016, Y County.
14. In the test report offered by a public hospital in Y County, blood lead level less than 100 μg/L remains in normal range. According to World Health Organization [WHO] (2018), 'even blood lead concentrations as low as 5 μg/dL, once thought to be a "safe level", may be associated with decreased intelligence in children, behavioral difficulties and learning problems'.
15. Interview with GH, a villager in G Village, August 1, 2016, Y County. The test result was not available during the interview.

16. Interview with XK, a villager in G Village, July 29, 2016, Y County.
17. Interview with ZR, a villager in G Village, July 30, 2016, Y County.
18. Interview with ZR, a villager in G Village, July 30, 2016, Y County.
19. Y city refers to the place where the Y County government is located.
20. Interview with YH, a villager in G Village, July 29, 2016, Y County.
21. https://society.people.com.cn/n1/2016/0428/c1008-28311721.html.
22. Interview with SY, a villager in G Village, July 30, 2016, Y County.
23. Interview with LX, a villager in G Village, July 29, 2016, Y County.
24. Interview with ZH, a former village head of G Village, July 31, 2016, Y County.
25. Interview with GH, a villager in G Village, July 28, 2016, Y County.
26. Interview with XK, a villager in G Village, July 29, 2016, Y County.

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