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LI,Y., J.F.M. KOPPENJAN, AND S. VERWEIJ, (2016). GOVERNING ENVIRONMENTAL CONFLICTS IN CHINA: UNDER WHAT CONDITIONS DO LOCAL GOVERNMENT COMPROMISE? PUBLIC ADMINISTRATION, DOI: 10.1111/PADM.12263.

GOVERNING ENVIRONMENTAL CONFLICTS IN CHINA: UNDER WHAT CONDITIONS DO LOCAL GOVERNMENTS COMPROMISE?

Abstract

In recent years, governing environmental conflicts concerning the planning, construction, and operation of urban facilities has increasingly become a challenge for Chinese local governments. Chinese governments seek adequate responses to deal with these conflicts, for instance by ignoring criticism and sticking to initial decisions, by suppressing protests, or by compromising. In this article, by analysing 10 conflict cases in China using crisp-set qualitative comparative analysis (csQCA), we aim to investigate which combinations of diverse conditions lead to changes in local governments' decisions. Four contextualized paths to explain both the presence and the absence of these changes are identified. These findings increase our understanding of the mechanisms underlying the governance of environmental conflicts in China and may inform Chinese governments and non-state actors seeking ways to deal adequately with them.

1. Introduction

China has made great economic progress in the past 30 years. However, one of the by-products of its economic achievements is becoming ever more apparent: an increasing number of environmental conflicts. It is reported that, since 1997, environmental conflicts in China have increased by an average of 25% annually (Hou and Zhang 2009). The environmental

conflicts studied in this article concern disputes among diverse actors – such as government officials, local residents, experts, environmental NGOs, and activists – over the planning, construction, and operation of urban industrial facilities that have potentially negative environmental implications. These conflicts are characterized by the mobilization of opposition to these facilities, resulting in public protests that sometimes involve the use of violence.

These types of conflicts are also found in Western democracies over facilities like dams, nuclear power plants, airports, waste disposal facilities, and chemical plants (Kraft and Clary 1991; Wolsink 1994). Various international scholars on environmental conflict resolution and governance (Amy 1987; Glasbergen 1995; Pierre and Peters 2000; Van Bueren *et al*. 2003) have discussed how environmental conflicts should be governed. Their findings suggest that governments should resolve environmental conflicts by negotiation and consensus building, looking for a win-win solution that does justice to the various interests involved, thus transforming environmental conflicts from zero-sum into zero-plus games (Anonymized reference B).

China can be characterized as a fragmented authoritarian country. Laws and policies are drafted primarily in Beijing, but local governments are the main implementers, enjoying high discretion to govern local affairs (O'Brien and Li 2006). It is, therefore, relevant to focus our attention on Chinese local governments, exploring how they deal with environmental conflicts that fall within their jurisdictions: do they stick to their initial plans or are they prepared to compromise, taking the considerations of protesters into account? And more specifically: what conditions influence the occurrence of either of these responses? In this contribution, we therefore examine the question: *under what conditions do Chinese local governments change their initial decisions regarding the construction and operation of urban industrial facilities during environmental conflicts?* To this purpose, 10 cases of environmental conflicts about

Chinese urban projects are analysed with crisp-set qualitative comparative analysis (csQCA) (Ragin 1987). The use of csQCA enables us to identify under what (combinations of) conditions local governments may change or not change their decisions about the debated industrial projects.

The structure of the article is as follows. First, the conceptual framework is presented (Section 2). In Section 3, the csQCA method is briefly introduced. The empirical information about the cases and data calibration is elaborated in Section 4. The analysis and results are presented in Section 5. The final section concludes and discusses the findings.

2. Conceptual framework

In this section, two main issues are discussed: the definition of changes in government decisions and the explanation of governments' decisions in governing environmental conflicts.

2.1 Defining changes in government decisions in environmental conflicts

Various scholars have studied how Chinese government officials, and more specifically Chinese local governments, deal with social conflicts, including conflicts over environmental issues (Shi and Cai 2006; Cai 2008a, 2008b; Li and O'Brien 1996; O'Brien and Li 2006). Some of these studies have shown that the Chinese government is learning to shape, and to respond to, complex problems. It is moving away from the traditional authoritarian way of controlling society and towards a more sophisticated approach. This newly accepted, explanatory model of governance in China is coined *responsive authoritarianism*, implying that the Chinese state is responsive to the demands of citizens but maintains social control (Van Rooij *et al*. 2014). The Chinese government is increasingly adjusting its strategies

depending on the situation at hand. Cai (2010) found that local governments in China adopt four different responses to cope with social conflicts, namely, ignoring, repressing, compromising with discipline (meeting some of the demands of citizens and punishing some citizens), and compromising by meeting all the demands of citizens. The former two responses imply that local governments stick to their initial decisions, whereas with the latter two they change them by either small or radical compromises. In this article, we seek to find out what government responses to environmental protest can be found – in terms of changing the initial decision regarding the realization or operation of a facility by making compromises, or not – and we also seek to explain these responses. During environmental conflicts, local governments are confronted with contradictory pressures that compel them to choose between economic interests (realizing or maintaining the facilities) and environmental and social values (reducing negative environmental impacts; keeping social order) (Deng and Yang 2013; Lang and Xu 2013; Mertha 2009). Various conditions could contribute to a specific balance between these contradictory pressures or a change in this balance, making Chinese governments decide to either stick to their original decisions and let economic interests prevail, or make compromises and seek to balance these interests.

2.2 The explanation of the changes in government decisions in governing environmental conflicts

The literature on governance and environmental conflict resolution as developed in Western countries does not tell us much about the conditions under which governments change their policies aimed at the realization and operation of industrial facilities. At the macro level, the governance literature suggests that the increasing complexities of problems and societies make governments more aware of their dependencies upon other societal parties. This results in a shift from traditional top-down practices to governance, which implies negotiation, consensus seeking, and compromise (Koppenjan and Klijn 2004; Pierre and Peters 2000).

Institutional theory would add that the mechanism of isomorphism would enhance the spread of these new practices worldwide (Lodge and Wegrich 2005). The shift in government strategies in specific conflicts at the meso or the micro level is not explicitly addressed in these literatures however. Case studies published in these traditions provide us implicitly with information on what makes governments – mainly in Western democracies – change their strategies from ignoring or rejecting protesters' demands against the construction or operation of projects to entering into dialogue and compromising. Scholars suggest a number of factors that influence these shifts: the pressure of mass media supporting the protest, political changes due to the electoral cycle or to shifts in preferences by politicians fearing electoral losses, the economic cost of ongoing protests, or the occurrence of external events that impact upon the perceptions of the contending parties (Glasbergen 1995; Koppenjan and Klijn 2004; McAdam and Boudet 2012; Van Bueren *et al*. 2003). As most of these studies are on cases in a Western context, the question arises as to whether similar conditions will be at work in China. Therefore, we now turn to literature on social conflicts in China.

Studies on social conflict resolution in China provide us with possible explanations for changes in government decisions in the Chinese context. In this literature, we identified seven conditions: the scale of protests, the form of protests, the position of the higher-level government, the position of national mass media, the cost of accommodating protesters' demands, the involvement of activists, and the occurrence of events (Li 2016). The nature of protests (referring to the number of protesters and whether violence occurred or not) influences government decisions during environmental conflicts, given the potential outcome of social unrest caused by the protests. Chinese local governments are sensitive to social unrest, and, when they find that social unrest may emerge, they tend to change their initial decisions (O'Brien and Li 2006). In China, local governments are responsible to their higher-level governments; the positions of the higher-level governments thus matter in influencing

local governments' decisions (Cai 2010). The position adopted by national mass media signifies the attitude of the key central government leaders. It therefore plays an important role in shaping the decisions of local governments during environmental conflicts (Johnson 2014). The costs involved in resolving citizens' demands exert an influence on government decisions during environmental conflicts. If the costs of acceding to such demands are very high for local governments, they tend to stick to their initial decisions. Activists are sometimes involved in environmental conflicts, and they coordinate the actions of local citizens to influence government decisions. Local governments have to treat the involvement of activists seriously given the activists' ability to mobilize various resources (such as social media, personal networks, or reputation) to exert pressure on local governments (Shi and Cai 2006). The occurrence of events matters to local governments in environmental conflicts because they will attract explosive attention around China. Local governments, in turn, have to be prudent in applying strategies in order to avoid any social disturbances (Cai 2004).

In a comparative study, Anonymized reference (A) used the most similar system design (MSSD), which follows a quasi-experimental logic to seek for covariation between the dependent variable and the independent variables (or conditions). Normally, the conditions that co-vary with the dependent variables are relatively important in explaining the differences between the cases. Four of the seven conditions – the position of higher-level governments, the stage of the projects, the position of the national mass media, and the form of protests – are found to be relatively important conditions in explaining the strategies of local governments in governing environmental conflicts. In this article, we follow the conclusions drawn from Li (2016) that these four conditions are important in explaining both the occurrence and the non-occurrence of government compromises during environmental conflicts.

However, we have made two adjustments to the selection of these four conditions. First,

two conditions, namely, the position of the national mass media and the position of higher-level governments, are merged into one condition: the position of the Chinese central government. The reason for this is that the Chinese national mass media, such as Xinhua News Agency, Renmin Daily, and China Central Television, are government agencies affiliated to the Chinese central government (Li et al, 2015). Second, through the iterative use of QCA, we have included a fourth condition: the scale of protests. In this article, we aim to further explore how these four conditions work in a combined way to produce changes in government decisions.

1. ***The scale of protests***. Cai (2004) has found that the scale of protests is one of the most important conditions in shaping the decisions of local governments in social conflicts. Normally, the smaller the protest's scale, the less likely it is to succeed. Large-scale protests imply 'big trouble' for local governments, and this may pressurize them to such an extent that they change their initial decisions regarding the policy or project that evoked the protests (Cai 2008a; McAdam and Boudet 2012). However, some exceptions may occur. In one study by Lang and Xu (2013), it was found that small-scale protests can be successful if the protesters are able to use various network resources (such as journalists, editors, environmental NGOs, or experts).
2. ***The form of protests, more particularly the occurrence of violence***. Maintaining social stability is an important 'hard target' for Chinese local governments (O'Brien and Li 2006). The use of violence, either by protesters or by local governments, is likely to be viewed by the Chinese state as a threat to social stability that demonstrates the inability of lower governments to keep the situation under control. Therefore, lower governments may go to great lengths to prevent or contain violent protests. Some scholars (e.g., McAdam 1983; Tarrow 1994) conclude that the use of violence increases the protesters' chances of reaching their goals. We argue that, if protests include the use of violence,

there is a high chance that local governments will change their initial decisions in an attempt to prevent escalation.

3. ***The position of the national government***. As a single-party, non-democratic authoritarian regime, the Chinese central government grants local governments 'conditional autonomy' (Charron and Lapuente 2011). This means that local governments typically have significant discretion to cope with social conflicts, but that the Chinese state government will intervene when local governments fail (O'Brien and Li 2006). In addition, local government officials are appointed by their higher-level governments, and they therefore feel that they are primarily accountable to them. As a result, they are less responsive to the demands and needs of citizens. This implies that local governments, when making their decisions about resolving environmental conflicts, are inclined to follow directly the central government's orders or to figure out its implicit intentions. So, if a local government has the impression that the central government does not support its decisions, it is inclined to adapt these.

4. ***The costs of meeting the demands of citizens***. Social conflict resolution involves costs for local governments (O'Brien and Li 2006). Studies have found that, when local governments consider it too costly to meet the demands of citizens, they will ignore these demands or resort to repression (Cai 2008b). Cai (2010) additionally concluded that local residents are most likely to succeed in their protests when their demands do not bear high costs for local governments. The environmental conflicts studied in this article concern the planning, construction, and operation of urban industrial facilities, which are in different stages and thus carry with them different costs for local governments. Local governments consider these costs when deciding how to respond to protests. Kemberling and Roberts (2009) found that fighting the siting of new facilities is more likely to be successful than fighting existing facilities. When projects are in

their early stages, costs of change are low, and local governments will be more likely to adapt their decisions. Conversely, they may tend to stick to their initial decisions when the projects are in their later stages and the costs of change are higher.

As stated, various authors have identified conditions influencing government responses to conflicts in China. However, these studies did not clarify how these conditions combine to affect government decisions. This is important though, because, in actual conflicts, conditions sort an effect conjunctively. Qualitative comparative analysis (QCA) allows for determining which combinations of conditions are necessary and/or sufficient to result in local governments changing their decisions during environmental conflicts. In the next section, the fundamentals of csQCA, a specific form of QCA, are briefly introduced.

3. Method

QCA combines the richness of in-depth case knowledge with the ambition to identify patterns across cases (Ragin 1987). Consequently, it is becoming increasingly popular in social science research (Rihoux *et al*. 2013; Verweij et al 2014). QCA is a set-theoretic method, which means that it studies the necessity and/or sufficiency of conditions – in our study: the four explanations discussed above – to produce a certain outcome of interest (Schneider and Wagemann 2012), in our study: decision changing by Chinese local governments. A condition X is necessary if the outcome cannot be produced without it. After analysing necessary conditions, one analyses the sufficiency of conditions (see Schneider and Wagemann 2010). Sufficiency means that, if a specific condition occurs, the outcome will follow. Often, conditions are not singularly necessary and/or sufficient, but rather combine to form necessary or sufficient configurations. Additionally, there are often multiple configurations, or ‘paths’,

associated with an outcome. This highlights the equifinal nature of QCA.

Two measures are used in QCA to assess the strength of causal relationships between conditions and outcomes (see Thomann 2015; Ragin 2006). The consistency of a necessary or sufficient condition/configuration gauges the *theoretical strength* of the relationship. The coverage measure gauges the *empirical relevance* of a condition, i.e., the portion of cases that exhibit the relationship (Ragin 2008; Schneider and Wagemann 2010, 2012).

QCA involves several steps. First, the data are collected. The data collection for the cases in this article comprised two stages. In the first stage from 2009 to 2013, secondary information and data were collected from news reports, government documents, national laws, and documents of environmental NGOs. From March to June 2014, empirical fieldwork was conducted in four Chinese cities: Nanjing, Beijing, Shanghai, and Guangzhou. Thirty-two semi-structured interviews were conducted, including government officials, activists, experts, environmental NGOs, journalists, and local citizens, averagely lasting about one hour. Also, the first author of this article participated in two workshops in Shanghai and Guangzhou. During the fieldwork, the interviewed respondents talked about the case in this article with which they were familiar. Second, a data matrix is constructed. This involves calibration: the transformation of the raw, coded data into crisp-set data. CsQCA works with dichotomous conditions. We opted for this because of the richness of the available data; data are often secondary, limiting the possibilities of calibrating conditions and outcomes into multi-value or fuzzy sets. In addition, the limited number of cases (i.e., 10) makes csQCA a better option. Calibration is a crucial step in the QCA process, and it needs to be reported in detail (Schneider and Wagemann 2010). This is done in the next section.

The third step is to reorganize the cases from the data matrix into a truth table. This table is the key tool for the analysis of sufficiency. In a truth table, each row represents a logically possible configuration. In our study, there are 2^4, i.e., sixteen, possible configurations. On

the basis of the coded case data, it is then decided what outcome (i.e., 0 or 1) is associated with each configuration. The truth table also shows which cases cover which configurations. Logically possible configurations not covered by any cases (i.e., empty truth table rows) are coined *logical remainders*. These may be used as counterfactuals to produce more generalized patterns.

The fourth step is the pairwise comparison of configurations from the truth table that agree on the outcome and differ in only one of the causal conditions (Ragin 1987). This produces the results of the analysis, also called *solution formulas*. Three types of solution formulas can be produced: the conservative solution, the parsimonious solution, and the intermediate solution (Schneider and Wagemann 2012). For the conservative solution, no logical remainders are used as counterfactuals. For the parsimonious solution, logical remainders are assumed to produce the outcome (i.e., 1) and are therefore included in the pairwise comparison. The intermediate solution incorporates only the counterfactuals that are in line with both empirical evidence and directional expectations. These are coined *easy counterfactuals*. We work with the conservative solution, because this does not require us to make assumptions about logical remainders for which we do not have empirical support (Ragin 2008).

CsQCA uses Boolean algebra to analyse cases. In Boolean algebra, the following notational conventions apply: an uppercase letter represents the [1] value for a given binary condition, and a lowercase letter represents the [0] value for a given binary condition. Two basic operators are employed in csQCA, namely: logical-AND, connoted by the [*] (multiplication) symbol, and logical-OR, connoted by the [+] (addition) symbol. The connection symbol [→] that links conditions and the outcome expresses the sufficiency of a causal relationship. The connection symbol [←] that links conditions and the outcome expresses the necessity of causal relationships.

The next section reports on the calibration, followed by the analysis and results in Section 5, and the interpretation of the results in the final section.

4. Calibration and empirical data

The occurrence of the Xiamen PX protest in 2007, in which thousands of local Xiamen residents took to the streets to oppose to the construction of a paraxylene (PX) plant, signalled the beginning of a series of a relatively new type of environmental conflict (Ansfield 2013). Since then, similar conflicts have occurred in several other cities, such as Beijing, Shanghai, Guangzhou, Ningbo, and Dalian. These conflicts, especially anti-PX and anti-waste incineration protests, are characterized by public gatherings of residents protesting against potential pollution (Johnson 2014). Currently, these protests receive a lot of media attention in China.

In this article, 10 cases concerning the planning, construction, and operation of waste incineration power plants or PX plants in different urban regions in China are studied. They cover the most intensively reported cases that occurred from 2007 to 2013. Some cases that occurred between 2007 and 2013, such as the PX case in Jiujiang in 2013, are not studied here because of a lack of empirical information. In addition, environmental conflicts that occurred after 2013, such as the Yuhang waste incineration power plant case in Hangzhou in 2014, the Maoming PX case in Guangzhou in 2014, the Longgang waste incineration power plant project in Shenzhen in 2014, and Luoding waste incineration power plant project in Guangzhou in 2015, are not studied in this article either, as they occurred after the collection of data. Table 1 summarizes the 10 cases of environmental conflicts.

TABLE 1 *The 10 cases and their key characteristics*

Case	Abbr.	Period	Brief description of the case
Ningbo PX	NB	2012.10 – 2012.10	When local residents realized that a PX plant was to be constructed, they took to the streets to protest against it. Over three protests, maximally involving about 1,000 local residents, occurred. The local government eventually abandoned the project.
Xiamen PX	XM	2006.11 – 2007.11	A peaceful protest occurred, involving 8,000 to 10,000 participants, initiated by local residents to oppose the construction of a PX plant. The State Environmental Protection Administration (SEPA) advised Xiamen Municipality to reconsider its decision. The planned project was finally relocated to Zhangzhou, another city in Fujian province.
Dalian PX	DL	2011.08 – 2012.12	After an explosion, about 12,000 local residents held a peaceful protest against the Dalian PX plant. The mayor of Dalian Municipality promised to relocate it. However, after an initial closure of the plant, operation was resumed.
Kunming PX	KM	2013.04 – 2013.09	Two protests against the construction of a PX plant occurred, initiated by local residents, both involving over 2,000 participants. The PX plant was part of a mega project. The mayor promised that the project would be cancelled, but later the planning of the project was resumed anyway.
Pengzhou PX	PZ	2013.05 – 2013.10	In Pengzhou, as a part of a mega project including the PX plant, a refinery was constructed. Following an earthquake, local residents realized the safety risks involved and hence planned to organize a protest. The planned protest was prevented by the local

			government. Reportedly, the PX plant was finally advanced secretly.
Panyu incineration power plant	PY	2009.12 – 2012.06	Some activists used social media to attract public attention and to pressurize local governments in Guangzhou. This resulted in a peaceful protest involving about 500 participants. Eventually, the planned waste incineration power plant was relocated.
Liulitun incineration power plant	LLT	2006.12 – 2009.09	National mass media extensively reported on the debate about the Liulitun waste incineration power plant in Beijing. In response, the national government ordered local governments to reconsider the project. About 1,000 participants gathered in a peaceful protest, eventually resulting in the relocation of the plant.
Tianjingwa incineration power plant	TJW	2008.09 – 2011.11	When about a hundred local residents went to the local government to express their discontent with the construction of a waste incineration power plant, they were attacked by anonymous people. Finally, the proposed plant was relocated.
Songjiang incineration power plant	SJ	2012.05 – 2012.08	Local governments decided to construct a waste incineration power plant, leading to strong opposition from local residents. About 600 residents took to the streets to express their opposition. A small-scale violent confrontation occurred between the local residents and governments. In the end, the originally planned project was relocated.
Wuxi incineration power plant	WX	2011.03 – 2012.05	Local governments planned to build a waste incineration power plant in Wuxi to resolve the waste problem. The local residents were unaware of this until the plant started its trial operation. A large-scale protest involving about 10,000 local residents occurred, initiated by local citizens. Local governments promised

	to temporarily halt the project. Afterwards, when some residents gathered to protest, local governments used state force to disperse them, resulting in a very violent confrontation involving about 4,000 anti-riot police officers. Finally, the constructed plant was dismantled.

An overview of the calibration of the outcome and the four conditions is presented in Table 2. The calibration procedures are elaborated in detail (Schneider and Wagemann 2010). The calibrated data can be found in Appendix 1.

TABLE 2 *Overview of the calibration*

	Set	Indicator	Case	Score
Outcome	The occurrence of compromises	Project relocation	LLT, TJW, SJ, PY, XM	1
		Project cancellation	WX, NB	
	The absence of compromises	Project continuation	DL, PZ, KM	0
The scale of protests	Large-scale protests	Protests with more than 5,000 participants	XM, DL, WX	1
	Small-scale protests	Protests with fewer than 5,000 participants	NB, PY, LLT, SJ, PZ, TJW, KM	0
The form of protests	The presence of violent protest	The occurrence of casualties or injuries	NB, WX	1
	The absence of violent protest	No casualties or injuries	DL, PZ, LLT, PY, XM, KM, SJ,	0

			TJW	
The stage of protests	Early stage	Planning	NB, PY, LLT, TJW, SJ	1
		Initial construction	XM	
	Late stage	Before operation / trial operation / substantial investment	PZ, WX, KM	0
		Formal operation	DL	
The position of national government	The presence of support	Support	DL, PZ, KM	1
	The absence of support	Silence / contradiction / opposition	NB, PY, SJ, WX, TJW, XM, LLT	0

In the following, we provide detailed information about the calibration of the outcome and the four conditions studied in this article.

Outcome: The occurrence of decision changes by Chinese local governments during environmental conflicts

The substantive outcome of the debated projects is the indicator used for calibrating the outcome condition. Three substantive outcomes are identified: project relocation, project cancellation, and project continuation. They are calibrated into the occurrence of decision changes and the absence of decision changes. Cases scored ‘1’ are indicated by project relocation or project cancellation, and cases scored ‘0’ are indicated by project continuation.

Condition 1: The scale of protests

The scale of protests is measured by the number of participants. In some cases, more than one protest occurred. In this article, we take the protest with the largest number of participants as indicative. The number of participants refers to the number of participants mentioned in the mass media. Note that the empirical data used for this is approximated since it is primarily derived from media. The Chinese central government is sensitive to large-scale mass protests, and it has ruled that the number of participants in petitions should not exceed five. Hence, Shenzhen Municipality, for example, classifies occurrences with over 1,000 participants as major mass protests. However, due to the sensitivity of the Chinese state to the number of participants in protests, the number of participants reported by the Chinese mass media tends to be inaccurate.

The number of 5,000 is chosen as the cross-over point to dichotomize cases' membership scores in the set: large-scale protests versus small-scale protests. This cross-over point depends on the data distribution regarding the number of participants (see Appendix 1): we observe a big gap in the cases between the numbers 2,000 and 8,000. Second, cluster analysis using the Tosmana QCA software (Cronqvist 2011) identified 5,000 as the cross-over point. For the Xiamen case, the reported numbers of participants range from 8,000 to 10,000. We use 8,000 as the number of participants in the protest in Xiamen. The cases' scores are robust: the value of 10,000 participants indicates the number of 6,000 as the cross-over point, but this does not influence the calibration.

Condition 2: The form of protests

The set is calibrated into the presence of violent protests and the absence of violent protests. The occurrence of casualties or injuries indicates violent protests (calibrated as '1'), and their

non-occurrence indicates non-violent protests (calibrated as ‘0’).

Condition 3: The stage of projects

Four project stages are identified: planning, early construction, final construction, and formal operation (see Table 2). The first two stages involve limited monetary investments. The latter two involve large investments, and this complicates making compromises. Cases are calibrated into projects in the early stage and projects in the late stage. The former are scored ‘1’ and the latter ‘0’.

Condition 4: The position of the Chinese central government

Four positions held by the Chinese central government in the debated projects during environmental conflicts are identified: silence, support, contradiction, and opposition. *Support* means that the Chinese central government attempts to legitimize the advancement of the debated project. *Silence* implies that it does not publicly show its position. *Contradiction* implies that several government agencies manifest different positions about the debated projects. *Opposition* means that the Chinese central government advises or orders local governments to reconsider the debated projects. The cases are divided into the presence of support and the absence of support. It should be noted that the Chinese central government may hold different positions during a case. In the analysis, we took its position after the occurrence of protests as indicative for the calibration. The attitude of the Chinese central government at that time often represents its real positions, which is an important reference for local governments to orient themselves.

The positions of the State Council’s ministries, or of the Chinese national mass media (most notably the People’s Daily, China Central Television, and the Xinhua News Agency),

are used to calibrate the condition. A case calibrated as ‘1’ signals that the ministries or the national mass media support the advancement of the project; cases calibrated as ‘0’ denote the absence of support. Calibration of the conditions and the outcome are presented in Table 3.

TABLE 3 *Data matrix*

		Conditions				Outcome
Row	Case	L	V	E	S	C
1	NB	0	1	1	0	1
2	XM	1	0	1	0	1
3	DL	1	0	0	1	0
4	KM	0	0	0	1	0
5	PZ	0	0	0	1	0
6	PY	0	0	1	0	1
7	LLT	0	0	1	0	1
8	TJW	0	0	1	0	1
9	SJ	0	0	1	0	1
10	WX	1	1	0	0	1

Notes: L = scale of protests, V = form of protests, E = stage of projects, S = position of the national government, C = occurrence of decision changes by local governments.

5. Analysis and results

The objective of this article is to explain the *occurrence* or *non-occurrence* of decision changes by Chinese local governments. The two outcomes are separately analysed in Sections

5.1 and 5.2, using the fs/QCA software (Ragin and Davey 2014).

TABLE 4 *Truth table*

Row	Conditions				Outcome	Case
	L	V	E	S	C	
1	0	1	1	0	1	NB
2	1	0	1	0	1	XM
3	0	0	1	0	1	PY, LLT, TJW, SJ
4	1	1	0	0	1	WX
5	1	0	0	1	0	DL
6	0	0	0	1	0	PZ, KM

5.1 Explaining why local government changed their decisions during environmental conflicts

For the analysis of necessity, the recommended consistency threshold of 1 is used, as this means that contradictory configurations are not included in the minimization of the truth table (Schneider and Wagemann 2012). The results of the necessity analysis, provided in Table 5, show that the absence of support from the national government has a consistency of 1, implying that, when local governments change their original decisions, they always do so in the absence of support from the national government. The other conditions have a low consistency ranging from 0.14 to 0.86.

TABLE 5 *Analysis of necessary conditions for decision changes by local governments during environmental conflicts*

Conditions	Consistency	Coverage
LARGE	0.29	0.67
large	0.71	0.71
EARLY	0.86	1.00
early	0.14	0.25
SUPPORT	0.00	0.00
support	1.00	1.00
VIOLENT	0.29	1.00
violent	0.71	0.63

The sufficiency of conditions is analysed with the truth table analysis. We focus on the conservative solution formula because the parsimonious solution was unrealistically simple and the intermediate solution makes the distinction between theory and the empirical analysis unclear (Schneider and Wagemann 2012). The conservative solution formula was s*E*l + v*E*s + V*e*s*L → C, and the parsimonious solution formula is s → C. The conservative solution formula, provided in Table 6, includes three paths, i.e., three configurations that are sufficient for decision changes. The perfect consistency score (i.e., 1) indicates the absence of contradictions in the data. In what follows, the three paths and their corresponding cases are elaborated in detail.

TABLE 6 *Conservative solution formula for decision changes by local governments during environmental conflicts*

Path	V*e*s*L	v*E*s	s*E*l
Case	WX	XM, SJ, TJW, PY, LLT	PY, LLT, NB, SJ, TJW
Raw coverage	0.14	0.71	0.71

Unique coverage	0.14	0.14	0.14
Solution coverage	1		
Solution consistency	1		

Notes: Raw coverage indicates the proportion of the case outcomes covered by a single path (Ragin 2008). Unique coverage indicates the proportion that is uniquely covered by a single path (Schneider and Wagemann 2012). Solution coverage measures the proportion of the cases with the outcome that are explained by the entire solution (Ragin 2008). Solution consistency indicates the degree to which the solution contains contradictory truth table rows.

Path 1: The combination of the presence of large-scale (L) and strong violent protests (V), late stage of the project (e), and absence of support from the Chinese central government (s) leads to the occurrence of compromises by local governments during environmental conflicts.

This path identified three *insufficient* but *non-redundant* conditions that are part of an *unnecessary* but *sufficient* (INUS) configuration (Mackie 1980), namely, the presence of violent protests (V), large-scale protests (L), and late stage of the project (e). Recall that (s) is not an INUS condition, but a necessary condition (see Table 5). Without (s), the decision change will not occur. This path covers the Wuxi case. The waste incineration power plant had finished its trial operation. Abandoning it would be very costly for local governments. It was reported that over 4,000 anti-riot police were dispatched by local governments in Wuxi to suppress local citizens. As already discussed, the Chinese state is sensitive to the occurrence of large-scale violent confrontations. If they occur, the tension between local residents and local governments is very high. In the Wuxi case, after the large-scale violent confrontation, relevant information about it was censored by the Chinese state. Large-scale violent confrontation between local governments and citizens is a political taboo, after which the state normally tends to keep silent; and discussion about the Wuxi case was inhibited. As argued by

a coordinator working in a Beijing-based environmental NGO (respondent 9), if the waste incineration power plant had been further advanced, then the violent confrontation in Wuxi might have become widely discussed across China. This would significantly damage state legitimacy. To avoid this, local governments in Wuxi preferred to change their decisions even though this was costly.

Path 2: The combination of early stage of the project (E), absence of violence (v), and absence of support from the central government (s) results in the occurrence of government compromises during environmental conflicts.

The second path identified two INUS conditions: early stage of the project (E) and absence of violent protests (v). Five cases are covered by this path: the Panyu case, the Songjiang case, the Xiamen case, the Tianjingwa case, and the Liulitun case. In these cases, no strong violent protests occurred. In addition, the central government did not publicly show its support for these debated projects after protests. During the Songjiang case, the central government kept silent after the occurrence of the protest. In the Panyu case, after the occurrence of the protest, China Central Television reported citizens' concerns about the construction of the Panyu waste incineration power plant, as explained by an activist (respondent 17) interviewed in Guangzhou. In the Xiamen case, the State Environmental Protection Administration (SEPA) advised Xiamen Municipality to make a comprehensive environmental impact assessment for the whole Haicang region. In the Liulitun case, an activist (respondent 11) interviewed in Beijing, who was involved in the whole Liulitun case, claimed that the central government showed its opposition to the Liulitun waste incineration power plant twice. This was important in explaining the relocation of the project. In the Tianjingwa case, both the Ministry of Environmental Protection and the Ministry of Housing and Urban-Rural Development were involved. The former supported the continuation of the Tianjingwa waste incineration power

plant, whereas the latter investigated the project but did not show its position. In short, no violent protests occurred in the five cases, and the absence of support from the central government in the five cases gave local governments little confidence to further advance the debated projects. In addition, all five projects were in their early stage, implying that abandoning or relocating them was not that costly for local governments. As a result, they relocated or cancelled them.

Path 3: The combination of absence of support from the central government (s), early stage of the project (E), and absence of large-scale protests (l) results in the occurrence of government compromises during environmental conflicts.

This path identified two INUS conditions: the absence of large-scale protests (l) and the early stage of the project (E). This path covers five cases: the Panyu case, the Tianjingwa case, the Ningbo case, the Songjiang case, and the Liulitun case. All five cases were in their early stage, and the national government did not show its support for their continuation. Furthermore, no large-scale protests occurred in these cases. About 600 local citizens expressed their opposition to the construction of the waste incineration power plant in Songjiang. In the Liulitun case, about 1,000 participants went to SEPA to express their opposition to the construction of the Liulitun waste incineration power plant, as agued by an activist (respondent 11) interviewed in Beijing. In the Panyu case, hundreds of local residents went to Guangzhou Municipality to show their opposition to the construction of the Panyu waste incineration power plant. In the Tianjingwa case, about 100 local residents assembled in front of the Jiangsu Provincial Environmental Protection Department, demanding a conversation with its key leaders. In the Ningbo case, about 1,000 local residents participated in the protest. In sum, the combination of small-scale peaceful protests and the absence of support from the national government resulted in changes in government decisions during

environmental conflicts.

5.2 Explaining why local governments did not change their decisions during environmental conflicts

The analysis of the non-occurrence of decision changes by local governments follows the same procedures as in the previous section. Table 7 reports that the presence of support from the national government (S), late stage of the projects (e), or the absence of violent protests (v) are necessary conditions for the absence of decision changes. They have a consistency score of 1.00.

TABLE 7 *Analysis of necessary conditions for the absence of decision changes by local governments during environmental conflicts*

Condition	Consistency	Coverage
LARGE	0.33	0.33
large	0.67	0.29
EARLY	0.00	0.00
early	1.00	0.75
SUPPORT	1.00	1.00
support	0.00	0.00
VIOLENT	0.00	0.00
violent	1.00	0.38

The conservative solution formula of the analysis for sufficiency is v*S*e → c, and the parsimonious solution formula is S → c. The conservative solution can be expressed as follows:

Support from the Chinese central government (S) and the absence of violent protests (v) combined with the late stage of the projects (e) results in the absence of decision changes by local governments.

In the Dalian case, the National Development and Reform Commission framed the occurrence of the protest as a result of the unsafe production of PX. For the Pengzhou and Kunming cases, the national newspaper People's Daily and China Central Television propagated the harmlessness of the PX project and the necessity of the refinery projects. This implies that the Chinese central government supported the continuation of the Pengzhou and Kunming plants. In addition, a large-scale protest occurred in the Dalian case. This was confirmed by a policeman (respondent 25) interviewed in Dalian, who argued that the protest in the Dalian PX case was peaceful and the protesters were self-controlled. Two respondents (respondent 21 and respondent 22) interviewed in Dalian also confirmed the peaceful nature of the Dalian protest. The protest in the Kunming case was small, and the protest in the Pengzhou case was suppressed. In short, the protests in the three cases were all peaceful, implying that the relationship between local governments and local residents was not that hostile to start with. Finally, in the three cases, it was expensive to remove the PX plants or to cancel the projects. The Dalian PX plant had operated in Dalian for several years. A port expert (respondent 29) interviewed in Dalian doubted that the Dalian PX plant would be removed because of the financial implications. An expert at a university (respondent 26) interviewed in Dalian argued that no actor would like to assume such costs. In addition, the mega plant in Pengzhou was in its late stage, and also in the case of the mega plant in Kunming large investments had been made. This means that relocation or cancellation would also have been costly. To sum up, when there is support from the central government, combined with the late stage of the debated projects and the absence of violent protests, it is economically costly to change earlier decisions and politically safe to advance the debated projects. Thus, local governments tend to

stick to their earlier decisions.

6 Conclusions and reflections

In this contribution, using csQCA, we aimed to explain under what conditions Chinese local governments change their initial decisions on urban industrial facilities during environmental conflicts. We identified one necessary condition and three sufficient paths that explain the occurrence of decision changes. The necessary condition was the absence of support from the national government. We also identified one sufficient path that explains its non-occurrence, and in doing so three necessary conditions: the support of national government, the absence of violent protests, and high costs of accommodating protesters' demands. If we examine the findings of the analyses for the occurrence and non-occurrence of the outcome, in particular the support of the national government seems important: its absence is needed for local governments to change decisions, and its presence is needed for the absence of decision changes. This shows that the Chinese national government's influence is significant in governing local environmental conflicts in China. The symmetric nature of this finding strengthens the validity of the results of the respective analyses for the occurrence and non-occurrence of the outcome (see Van der Heijden 2015).

As regards the combinations of conditions, this article has found that especially the combination of the absence of central government support and the early stage of the projects is important in explaining decision changes by local governments in environmental conflicts. This combination explains six of the seven cases that resulted in changes in government decisions. Another important combination is the presence of central government support, the absence of violent protest, and the late stage of projects, resulting in governments not changing their decisions. Three of the cases studied showed this combination. By specifying

the conditions under which local governments in China are prepared to change their decisions regarding industrial facilities and engage in compromise, our research findings contribute to the existing literature. Many scholars agree that, when local governments find that social order is in danger, they tend to make compromises (see Deng and Yang 2013; Lang and Xu 2013; Mertha 2009). Our study identifies the causal patterns that result in these outcomes. These findings may inform Chinese governments and also non-state actors seeking for ways to deal adequately with environmental conflicts.

Our findings with regard to the occurrence of decision changes and compromises themselves also provide interesting insights. To date, most studies on environmental conflicts have been undertaken by scholars in Western democracies, indicating that best practices imply negotiation, mediation, and compromise, resulting in win-win outcomes (Fischer and Forester 1993). We might expect an authoritarian regime to simply impose its plans and suppress protests. However, in seven of the 10 cases, we see that local governments changed their initial decisions regarding the realization and operation of the industrial facilities, resulting in compromises (relocation) and even the complete abandonment of plans. Local governments even relinquish economic interests for social stability (the Wuxi case), and the Chinese central government sometimes publicly encourages local governments to take a pro-social and pro-environment direction (the Liulitun case). This is in line with ideas on responsive authoritarianism as recently proposed by Van Rooij and colleagues (2014). However, in many of our cases, we saw local governments making compromises meeting all the demands of citizens rather than compromises with discipline. These comprised the relocation or the abandonment of projects altogether. Certainly, the latter outcomes mean high costs or missed opportunities for governments.

An interesting and relevant question for further study therefore is whether and under what conditions the Chinese government may succeed in arriving at compromises that more

effectively balance contradictory economic, environmental, and social interests. This requires a research design more specifically focused on differences between compromises that reconcile interests versus other governance responses, with implications for the selection of cases and conditions.

Future research could also aim at increasing the number of cases because, although our analysis has produced results with a high consistency, the ratio between the number of cases and the number of conditions can be considered suboptimal. That is, 10 cases are an acceptable number in QCA, but with four conditions the number of observed configurations is limited. In particular, our analysis of the non-occurrence of government compromises builds on just three empirical observations. Further studies could aim to strengthen the generalizability of our research. All 10 cases studied in this article are about waste incineration power plants and PX plants, and the question remains as to whether other policy areas would yield different findings.

Last but not least, future research could consider applying different variants of QCA. Although some scholars argue that the elegance of simplicity is an advantage of csQCA (Marx *et al*. 2014), we experienced the restricted number of conditions that could be taken into account, and the dichotomization of conditions and outcomes, as limitations, also making their calibration challenging. For instance, we experienced difficulties in calibrating for the position of the national government. In Chinese practice, it is not easy to clearly judge the position of the central government, as its silence might also be interpreted by local governments as implicit support. In the future, it is worth exploring other variants of QCA, such as multi-value QCA (mvQCA) or fuzzy set QCA (fsQCA), to study decision changes by Chinese local governments on the basis of more granular data.

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APPENDIX 1 *Raw data matrix of the 10 environmental conflicts in China*

Case	Stage of the project	Form of protest	Scale of protest	Position of the central government	Outcome
NB	Planning stage	Strong violence	1,000	Silence	Project cancellation
XM	Initial construction stage	Peaceful	8,000–10,000	Opposition	Project cancellation
DL	Operation stage	Peaceful	12,000	Support[1]	Project continuation
KM	Planning stage / substantial investments	Peaceful	2,000	Support	Project continuation
PZ	Before operation	Peaceful	0	Support	Project continuation
PY	Planning stage	Peaceful	500	Silence	Project relocation
LLT	Planning stage	Peaceful	1,000	Opposition	Project relocation
TJW	Planning stage	Violent[2]	100	Contradiction	Project relocation
SJ	Planning stage	Peaceful	600	Silence	Project relocation
WX	Trial operation	Strong violence	10,000	Silence	Project cancellation

[1] In the Dalian case, the National Development and Reform Commission publicly framed the occurrence of the protest as the result of unsafe PX production, implicitly showing its support for the continuation of the project.

[2] It should be noted that a violent protest occurred in the Tianjingwa case, in which some persons from the Environmental Protection Department of the Jiangsu provincial government used violent force to suppress local residents. However, the influence of this violent protest on the application of local governments' strategies in Nanjing was limited. Consequently, the Tianjingwa case was calibrated as 0.