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A governance network perspective on environmental conflicts in China: findings from the Dalian paraxylene conflict

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ABSTRACT

Employing the Governance Network framework, this article presents an in-depth case study of the conflict that evolved from 2003 onwards over the construction and operation of a paraxylene plant in Dalian, China. The study explores the usefulness of this framework as an empirical tool to describe and make sense of policy processes and governance in multi-actor situations in China. The analysis shows the lack of anticipation and deliberation by Chinese governments, resulting in the buildup of citizens' concerns, mediated by social media beyond government control. This results in an outbreak of protest followed by uncoordinated governmental responses, with high costs for all parties. It is argued that, because of the underlying institutional causes, the challenges are even greater for Chinese governments to come to grips with the increasing need for internal coordination, deal with new social media, and balance economic and environmental values.

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Introduction

Chinese society is unquestionably changing. With the rise of the middle class and the growing impact of modern media, urban publics' increased receptivity to post-materialist values is leading to widespread concern about environmental degradation (Ho 2001; Liu and Diamond 2005). At the same time, local governments' competition for economic growth is resulting in huge investments in the petrochemical industry, nuclear power plants, and other industries that impact on the environment; and these developments are exacerbating concerns about environmental issues (Carter and Mol 2007). The serial protests against PX (paraxylene) projects in China in, respectively, the cities of Xiamen (2007), Dalian (2011), Ningbo (2012), Kunming (2013), and Pengzhou (2013) are examples of these environmental conflicts. PX is primarily used as a basic raw material in the manufacture of saturated polyester polymers, used in for instance clothing, food packaging, and soft drinks bottles (Maguin et al. 2006). Some studies argue that PX has no appreciable adverse non-cancer health risks for exposed populations (Li et al. 2014), but other research has found chronic toxicity effects on biological samples (Neuparth et al. 2014).

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This contribution aims to elucidate how these environmental conflicts evolve, and especially the way Chinese local governments respond to these conflicts. Using the Governance Network framework, this study examines this question by conducting an in-depth case study of the Dalian PX protest. This framework addresses the way interactions within a network of interdependent actors in highly fragmented, horizontal settings are coordinated or governed (Scharpf 1997; Mandell 2001; Sørensen and Torfing 2007). We define governance networks as the interaction patterns among autonomous but interdependent actors that evolve around a certain problem, policy, or policy program (van Bueren, Klijn, and Koppenjan 2003). Given these interdependencies, horizontal ways of policy-making and steering – governance – are needed to arrive at stable policies and solutions that do justice to the various interests involved. This does not imply that no hierarchical and market-based interventions will be found within networks. They will, but their effectiveness is limited since they will be counteracted by other actors' responses.

China, an authoritarian state, does not adopt the governance network approach developed within the context of western democracies. However, Chinese government nowadays is characterized by a high level of fragmentation and decentralization (Mertha 2009). The increasingly wicked nature of the problems with which it is confronted requires coordination among various actors: governmental agencies dispersed over various government levels and sectors, state-owned companies, private business, NGOs, citizens, and activists (Ho 2001; Weber and Khademian 2008; Li, Liu, and Li 2012). We therefore suggest that, despite cultural and institutional particularities, the Governance Network framework can be used as an empirical tool to analyze actions in multi-actor settings in China (see Zheng, De Jong, and Koppenjan 2010). We see the Governance Network framework as a framework in the sense in which Ostrom (2007) used this term. It does not provide hypotheses that predict and explain outcomes; rather, it is a 'rigorous means to organize inquiry' (Ostrom 2007, 25) by presenting a set of concepts, relationships, and assumptions to guide the analysis. In order to arrive at an explanation of the way the Dalian PX conflict evolved, we use the concepts offered by the Governance Network framework as tools to describe the process and its outcomes, and, to arrive at explanations, we use the factors that this framework suggests as guidelines to investigate relationships among variables.

Within the Western context, various studies have used the governance framework to analyze environmental conflicts (e.g. Glasbergen 1995; van Bueren, Klijn, and Koppenjan 2003). Compared to interpretative policy analyses that apply frames, framing, and discourses as central concepts, and deliberate democracy approaches that emphasize the role of stakeholder participation and exchange of arguments, the Governance Network framework provides a more comprehensive analysis by also incorporating strategic interactions and institutional factors (Rein and Schön 1993; Dryzek 2009; Fischer and Gottweis 2012). The Policy Advocacy framework (Sabatier and Jenkins-Smith 1993; Weible, Sabatier, and McQueen 2009) emphasizes competing policy coalitions, and does not see much room for cross-coalition learning. In contrast the Governance Network approach focuses – on interaction and negotiation to resolve conflicts, and on governance strategies to bridge differences between actors and enhance learning (Sørensen and Torfing 2007; Klijn and Koppenjan 2016). In this it is inspired by theories on environmental conflict resolution and integrative negotiation (Susskind 1987; Fisher, Ury, and Patton 1997). The Governance Network framework therefore can be seen as an empirical and normative framework.

We, however, use it primarily as an empirical tool, aimed at describing and explaining how the process regarding the environmental conflict evolved. As far as the normative implications of the model are concerned, we prudently ask the empirical question about the extent to which best practices – in terms of governance and conflict resolution – can be identified in a Chinese context and what contextual factors hinder or further this.

The Dalian PX case is an example of environmental conflicts as they increasingly occur with regard to the planning and operation of various industrial facilities in China. The case is even more interesting given the series of PX conflicts that have recently occurred in various large Chinese cities (Deng and Yang 2013). We do not have detailed information on the context of the various cases to establish the extent to which this case is representative. Therefore, we see the case as a revelatory case study (Yin 2009), allowing us, with the help of the theoretical framework, to identify the unique configuration of generic factors that constituted the specific involvement and the outcome of the Dalian case. In doing so, we aim not only to arrive at an explanation of the Dalian case, but also to strengthen the external generalizability of the case, since the identified configuration of factors can guide the comparative analysis of other, future case studies (Ragin 1992; Blatter and Haverland 2012). Data were collected from semi-structured interviews with civil servants, protesters, and experts conducted by the authors between August 2011 and September 2013 ($N = 12$),¹ and through analysis of official documents and news reports available on the internet. The collection of data for the case study was concluded in mid 2013. Since that time, no final decisions have yet been taken regarding the implementation of the solutions agreed upon.

Although various authors have been publishing on environmental conflicts in China (Cai 2004; Zhao 2004; Van Rooij 2010; Johnson 2013), in-depth case studies are scarce, given the difficulties associated with finding Chinese respondents and accessing official documents. This contribution provides such an in-depth study, since the research was carried out by an international team, bringing together access to data from Chinese language sources and skills to do an empirical qualitative case study.

The next section introduces the key concepts of the governance network framework. An overview of the involvement of the Dalian PX protest is given in the third section. The fourth section provides an analysis of the factors underlying the way the conflict evolved. The concluding section reflects on the implications of the findings.

The theoretical framework

In this section, the Governance Network framework is elaborated. First, concepts to analyze (environmental) conflicts in multi-actor settings are presented. Next, factors that explain interaction processes and their outcomes are discussed.

The interaction process regarding environmental conflicts

This contribution, using the governance network perspective, sees environmental conflicts as interactions among multiple actors with conflicting interests, perceptions, and strategies regarding the realization and operation of industrial facilities with perceived negative environmental impacts, for example, emissions with health risks, deterioration of the natural environment, noise nuisance (see Glasbergen 1995; van Bueren, Klijn, and

Koppenjan 2003). The Governance Network approach posits conflicts as a sequence of interactions among multiple actors aimed at influencing processes of public problem solving and public service delivery, involving various competing interests, perceptions, and values (Sørensen and Torfing 2007; Klijn and Koppenjan 2016). It introduces various concepts to analyze these interaction processes. Actors are individuals, groups, or (groups of) organizations from the public, semi-public, and/or private sectors that have the ability to act: to autonomously participate in interaction processes. They are dependent upon one another to accomplish their objectives because resources (e.g. money, personnel, information, skills, and authorities) are not concentrated in the hands of one actor, but dispersed over various actors (Scharpf 1997; Mandell 2001). Actors' actions are guided by their perceptions or frames: their subjective interpretations of the nature of the problem, the solutions and objectives to be pursued, the role and possible behaviors of other actors, and the nature of the wider environment (Rein and Schön 1993; Sabatier and Jenkins-Smith 1993; Klijn and Koppenjan 2016). On the basis of their perceptions, actors act by applying strategies: they invest their resources in order to influence the substance of the issues discussed, the course of the interaction process, and the perceptions and strategies of other actors. These strategies are not fixed, but are constantly adapted to the strategic moves of other actors (e.g. Mintzberg 1994). Actors interact in multiple arenas – places where actors enact their strategies and respond to the strategies of others. These arenas are not equally accessible to all actors (Ostrom 2007). As a result, interaction is not a linear process, but erratic and non-predetermined. This process can be described by distinguishing rounds: temporary configurations of actors in which these discuss and fight over specific issues and problem–solution combinations. Rounds start and end by changes in participation, shifts in issues or frames, or decisions being taken; or an external event influences actors' perceptions and strategies and triggers new issues (Teisman 2000). Building on theories of (environmental) conflict resolution and negotiation theory, network theory considers interaction processes successful if actors succeed in mutually adapting their strategies and arriving at joint solutions that can be qualified in game-theoretical terms as a win–win situation. Such a solution implies an improvement for all parties involved compared to the existing situation (Susskind 1987; Fisher, Ury, and Patton 1997; van Bueren, Klijn, and Koppenjan 2003; Dukes 2004).

Analyzing environmental conflicts requires reconstructing the rounds of interaction and their outcomes, by describing the actors involved, their perceptions, their strategies, and the way they interact.

Explaining the evolution and outcomes of environmental conflicts: five factors

The Governance Network framework suggests five clusters of factors: cognitive, social, institutional, managerial, and contextual, influencing the extent to which actors in network settings succeed in arriving, or fail to arrive, at (win–win) solutions (Klijn and Koppenjan 2016). These factors and propositions regarding the way they relate to outcomes are introduced in this section.

Cognitive factors. Cognitive factors relate to the diverging or conflicting perceptions of actors, which make it hard to arrive at joint solutions. The process of framing is important in this respect. Framing refers to actors' attempts to impose their perceptions of the problem

on others in order to influence the policy debate and the solutions that are considered (Rein and Schön 1993; Fischer and Gottweis 2012). Fights over problem definitions and solutions result in competing frames. The proposition based on this factor states that conflict resolution requires the emergence of consensus on a common frame, at least in some respect (see Susskind 1987; van Bueren, Klijn, and Koppenjan 2003; Dryzek 2009).

Social factors. Social factors refer to the characteristics of interaction – settings and locations (arenas) where actors meet and enact their strategies. Factors like the number, characteristics, and strategies of actors, the resulting collaborative or hostile game type, the time pressure and perceived risks result in a certain process dynamic that influences the capability of actors to align their strategies (Sabatier and Jenkins-Smith 1993; Ostrom 2007). The proposition based on this factor states that arriving at joint outcomes depends on the extent to which actors succeed in aligning, or fail to align, their strategies. If they do not, impasses or blockages may be the result. Or solutions may be reached that do not take important values or interests into account (Klijn and Koppenjan 2016).

Institutional factors. Institutions like organizational arrangements, rules, norms and values, and the level of trust, shape and constrain actors' behavior (Ostrom 2007). Networks can be seen as the formal and informal institutions that support the interactions among actors in a multi-actor setting (Blom-Hansen 1997). The proposition based on this factor assumes that, if networks and their institutions are strongly developed, it will be easier for actors to arrive at joint outcomes. If institutions are weakly developed, or actors from different networks have to collaborate, institutions may hinder interaction and conflict resolution.

Governance. Actors find it difficult to overcome conflicts of interest, uncertainty, and institutional barriers. Parties' strategies aimed at facilitation, mediation, and conflict resolution may contribute to preventing and overcoming conflicts and arriving at joint outcomes (Susskind 1987). The proposition based on this factor assumes that the presence or the absence of these types of governance strategies are important factors influencing processes and their outcomes (Mandell 2001; Sørensen and Torfing 2007).

External events. The processes of interactions and their outcomes in multi-actor settings may be influenced by external developments or events in their surroundings. The proposition based on this factor assumes that events, like incidents, disasters, affairs, economic or political crisis, and changes in political regimes, may support the achievement of joint outcomes by creating a shared sense of urgency among actors, or disturb these delicate processes of deliberation, negotiation, and consensus building (Kingdon 2002).

The propositions that the framework suggests are of a generic nature. The specific value taken by these factors in a specific case and the way they interact may vary. Therefore, we do not see them as hypotheses, but as heuristic tools. They indicate the direction in which to search for the conditions and the specific way in which they combine to produce specific process outcomes (Ragin 1992). The analysis therefore is aimed at identifying the configuration of factors that can explain the specific outcomes of the process in terms of conflict resolution.

The case of the Dalian PX conflict

Dalian is an international port city and a holiday destination in Liaoning Province, in northeast China, with nearly 6.7 million inhabitants in 2010 (National Bureau of Statistics

2012). The Fujia PX project, targeted in the 2011 protest, is sited inside Dagū Mountain Petrochemical Industrial Park, 20 km northeast of the city center (see Figure 1). Technically, Dalian met all conditions for a PX project with ports and oil refinery bases.

The network context of the Dalian PX case

As early as 2003, the National Revitalization Strategy of the Old Industrial Bases in Northeast China (State Council 2003) has already listed the petrochemical industry as a priority for the region's economic development. Dalian is part of that region. The Fujia PX plant was to produce over 100,000 tons of PX, implying that it had to obtain approval from the National Development and Reform Commission (NDRC), a macro-economic management agency under the Chinese State Council. In addition, before the formal construction of the Fujia PX plant, the project also had to be approved by the State Environmental Protection Ministry (State Environmental Protection Administration [SEPA] before 2008). According to the Law of the People's Republic of China on Appraising of Environment Impacts (Standing Committee of the National People's Congress 2002), prospective PX project developers need a pre-judgment from the NDRC before presenting an Environmental Impact Assessment (EIA) to the SEPA for administrative approval.

In addition to these actors and procedures at the central level, the network of actors in the Dalian case consists of the following local actors: *The Dalian State-owned Assets Supervision and Administration Commission (SASAC)* is a bureau of Dalian Municipality that is responsible for managing state-owned enterprises (SOEs) in the city, including appointing top executives and approving any mergers or sales of stock or assets. In September 2005, it signed a contract with Fujia Company, a private enterprise, to establish a new joint company, Fujia Dahua Petrochemical Co., with its subordinate SOE, Dalian Petrochemical Company, as the minority shareholder.



Figure 1. The location of Fujia PX plant in Dalian.

The *Dalian Municipal CPC Party Committee (DMC)* makes strategic decisions in general for the city. *Dalian Municipality* is the actual implementing body of such decisions. The top officer in DMC is the governor, who is responsible for the city's social stability. The mayor is the chief leader in the municipality and the second person in the DMC hierarchy mainly responsible for the city's economic development.

The *Fujia Dahua Petrochemical Company* owns the Fujia PX project, which produces 0.7 million tons of PX and contributes 0.9 billion RMB in tax annually. The chief executive was once a real estate business man. At the beginning of the project's planning phase, he had no experience in the chemical industry, but was reportedly trusted by top officers in Dalian (Larson 2011).

Three rounds of interaction in the Dalian PX case

Within the Dalian case, we distinguish three rounds of interactions. As indicated earlier, decisions or events that result in a major shift in participation or issues being discussed are used as criteria to distinguish rounds. Three important junctures can be identified as crucial events or decisions that demarcate the three rounds:

- (1) The 2003 decision of Dalian Municipality to initiate the PX project.
- (2) The Xiamen protest in 2007 that marks the start of the build-up of Dalian residents' concerns.
- (3) The outburst of protest by locals in 2011 and its aftermath.

Round one (2003–June 2007)

Since 2010, China has been the world's largest PX producer and consumer (*The Economist* 2014). In 2005, demand exceeded internal supply by 1.55 million tons and the deficit was met mainly by imports, 94.1% from Japan and Korea (Li 2011). The prospect of profit made Dalian Municipality eager to have a PX plant in its jurisdiction. The plan was initiated in 2003, with the SOE Dalian Petrochemical Company technically responsible for it. However, in 2004, the Decision on Reform of the Investment System (The State Council 2004) provided private enterprises the same investing opportunities as SOEs (Yuan 2004). This gave the Dalian SASAC the legitimacy to involve Fujia as main shareholder in the PX project in 2005.

The construction of the Fujia PX plant seemed very promising for industrial policy-makers in the NDRC. Not only could it enhance national self-sufficiency in PX, but also realize the national revitalization strategy for the old industrial bases in Northeast China as set by the State Council. 'Therefore in December 2005, the NDRC approved the Fujia PX project's construction. No public hearing was reported to have been held in Dalian in relation to the decision making on the Fujia PX project. Local media never mentioned the possible negative externalities of the PX plant either. Announcements on Dalian SASAC's website portrayed the project as another economic engine for Dalian (Dai 2009). This partly explains why the project did not get much attention from locals in this period.

Round two (June 2007–August 2011)

On 28 May 2006, the Xiamen municipal government announced its approval for a PX project in Haicang District, 7 km away from the city center. In December 2006, a professor

from Xiamen University, Zhao Yufen, with five other academics wrote a letter to the mayor of the city, stating that the PX plant should be at least 100 km away from residential areas. As a member of the National Committee of the Chinese People's Political Consultative Conference in national session, in March 2007 she submitted a proposal for the relocation of the Xiamen PX project, demanding enforcement of the rules and support from central bureaus, such as the NDRC and the SEPA. Xiamen Municipality did not respond to these concerns. Consequently, on 1 June 2007 more than 10,000 citizens gathered in front of the municipal hall to protest. Xiamen Municipality hastily halted the construction, and the project was relocated to another city in Fujian Province (Tu 2007).

The Xiamen PX protest made some Dalian citizens realize that a PX plant was being constructed no more than 20 km away from the city center. Social media spread the rumor that Dalian had accepted the project that Xiamen had previously rejected. PX became a hot topic in citizens' daily conversations. However, none of the Dalian municipal bureaus responded to the citizens' concerns, nor did they offer a credible refutation of PX's toxicity. In October 2007, the construction of the Fujia PX plant formally began, and Liaoning Province's official newspaper, *Liaoning Daily*, published an article celebrating the completion of the construction of the Fujia PX project in July 2009 (Liu and Yang 2009). Right after the plant went into full production, Dalian Municipality's official newspaper, *Dalian Daily*, publicly announced that from being an oil refining base, Dalian was now becoming a booming petrochemical base (Yun 2009). The SEPA and the NDRC did not react to Dalian citizens' concerns either. On March 2008, on the basis of recommendations from the environment protection department in Liaoning Province, as well as the NDRC's positive attitude, the SEPA publicly approved the EIA report on the Fujia PX project. It was stated that the plant would be located in the Petrochemical Industrial Park, in line with the urban plan and without negative effects on the environment.² In the same year, the NDRC authorized the inclusion of the Fujia Dahua Petrochemical Company in a national debt assistance scheme for a long-term low interest loan of 50 million RMB. This indicates that the Fujia PX plant was strongly supported by China's central government (Yan and Wang 2011). The attempts of the various governmental bureaus to frame the construction of the Fujia PX project in a positive way did not prevent or ease the social unrest. In 2009, Lu Renzi, a reporter from Dalian TV, published an open letter to top officials in Dalian online. On behalf of Dalian citizens, he suggested halting the Fujia PX project following the example of Xiamen Municipality. He also demanded the municipality to organize a press conference to answer citizens' questions. However, without an official response, activist Lu, who had a high profile in social media, ended up by resigning from his job, reportedly under pressure.

On 16 July 2010, there was an explosion in an oil storage depot belonging to China National Petroleum Corporation (CNPC), as a result of which 1500 tons of oil were spilled into the Yellow Sea (Southern Weekend 2013). There were quite a number of oil storage depots near the accident scene, and any further spread of the incident would have been a disaster for the residents living nearby. Terrified citizens fled from their homes, blocking the highways out of Dalian. Eventually, the fire was extinguished, but one firefighter died. A year later, on 16 July 2011, another explosion occurred on the CNPC site (Fenghuang News 2011). Although these accidents occurred in the CNPC plant and not in the PX plant, the citizens speculated in panic on the effects if the PX project exploded too.

On top of these events, on 8 August 2011, typhoon Muifa struck Dalian and breached one of the PX plant's protective dykes. Rumors spread in social media that the leakage from the PX storage tanks would flood the Yellow Sea with highly toxic PX. A CCTV news program intended to investigate this accident but failed to access the site because of resistance from the plant's executives (People News 2011). When they still intended to broadcast the story, the program director received a request to pull the segment and did so (Li 2011). Meanwhile, Dalian Municipality promised to take more administrative measures to avoid further accidents (Dalian Administration Bureau of Safety Working 2013). The Dalian Port Company, an SOE, echoed this request by immediately investing 100 million RMB in its emergency facilities. Thus far, there was still no official communication with citizens on the risks involved in the PX project.

Round three (August 2011–2013)

In this feverish context, on 14 August 2011, a message that spread through social media mobilized over 12,000 protesters in the city center, demanding that construction of the plant be halted and the plant relocated.³ The governor, who was barely two months in office, had a personal conversation with the protesters and promised to accede to their demands and to relocate the plant. That night, the DMC made a collective decision to confirm the governor's promise, which was echoed by Dalian Municipality on 16 August (Li 2011). The next day, every apartment in the city received a letter from the street-level bureaus of the municipality, in which the low risk of the PX plant was emphasized in an attempt to pacify citizens. (Interview with a public servant working in community, 30 September 2011; a policeman, 15 March 2012.)

One month later, responding to the Dalian PX protest, the NDRC's Industry Coordination Department co-signed with four concerned ministries an emergency notice to 'strengthen the security of sensitive products like PX', explaining to the public that the toxicity of PX was exaggerated and simultaneously raising the qualification standard for future PX projects. In August, the NDRC (2012) formulated a regulation to set a social stability risk assessment by local governments as a pre-condition for her approving large projects. Reflecting on the PX protests, the NDRC intended to establish an institutional frame for public participation before approving applications in order to avoid potential social unrest.

After the protest, PX became a sensitive word and was blocked from social media in Dalian.⁴ Over the next few months, Dalian Municipality, when asked about its future plans, consistently confirmed to reporters that the Fujia PX project would be relocated. At the same time, it emphasized that this process should be carefully evaluated and organized. In December, a commercial newspaper in Beijing reported on an official reply letter to the Dalian customs, implying the DMC's internal approval for the Fujia PX project to resume production (Chinese Management Network 2011). On 8 December, Dalian Municipality invited several petrochemical and environmental experts to a consultative meeting to discuss the possibility of relocating all the petrochemical factories, and not just the once-targeted Fujia PX project, from the Dagū Mountain Petrochemical Industrial Park to a newly built industrial park on Changxing Island (Wang 2012). This strategic change made the relocation even more complicated and costly.

The outcome of the Dalian PX case

The outcome of the Dalian PX case was a decision to stop the operation of the PX plant and to relocate it. In the meantime, operation has restarted, and the decision to reallocate it

has not been implemented. What is more, as the above description of the process shows, no open debate on the toxicity and the risks of the PX plant has taken place. The escalation of the conflict resulted in the municipal government agreeing to far-reaching compromises that, if implemented, would entail high economic costs, and if not implemented, would result in citizens having even less trust in the government. Also, the failure to establish a dialogue on the risks and a well-balanced decision on PX production in Dalian had spillover effects in other areas, creating additional costs, as in the case of later PX protests in Ningbo, Kunming, and Pengzhou (Interview expert, 27 April 2012). Overall, it can be stated that the outcome of the process was far from complying with best practices as theories on (environmental) conflict resolution, integrated negotiations, or governance networks suggest. Instead of realizing a win–win outcome, the process has resulted in a lose–lose outcome. Although eventually the plant resumed operation, the costs of the conflict were high for all actors involved.

Explaining the process and the outcomes of the PX conflict

In this section, we discuss how, in the light of the propositions formulated earlier, the five factors contribute to the explanation of the outcome of the process.

Cognitive factors: the framing of the issue

At the start of the project, the dominant framing was about the contribution of PX production to the revitalization of the economy in northeast China. The framing of PX as toxic emerged only after the Xiamen protest and the open letter from the Dalian TV reporter (Interview with two protesters, 25 August 2011; 30 August 2011, with a public servant in the DMC, 13 May 2013, and with a port expert, 30 May 2013). The explosions and dyke breach resulted in the framing of PX as threatening the health and lives of residents.

This PX frame was hardly challenged. The municipality did not engage in deliberation on the risks involved when this issues started to get debated in social media. As a result, it missed opportunities to actively influence the framing. The debates in social media evolved as a self-organizing process, with public opinion being framed by rumors, random opinions, and unconfirmed information. Only after the protest were letters from street-level bureaus delivered door-to-door, stressing the low risk of PX production. According to our respondents, this action can be seen as an effort by the municipality to calm down the social unrest (Interview with a public servant working in community, 30 September 2011). An interesting observation is that the explosion occurred in the state-owned petrochemical plant and not in the PX plant. So why did the framing target this plant? First of all, as a result of the Xiamen protest within ongoing debates in social media, frames were already available that stressed PX as a hazardous technology. Secondly, the image of the private CEO of the Fujia PX project – not being experienced in petrochemistry and having close relationships with local authorities – contributed to the perception that he was incompetent and interested in profits rather than in safety and that therefore the PX-plant was hazardous (Interview with a protester, 30 August 2011).

The first proposition, on cognitive factors, stated that conflict resolution requires the emergence of consensus. In the PX conflict, no consensus emerged regarding how actors perceived the problem and its solution. Insofar as perceptions changed, this

happened on the side of the municipality, which acknowledged the fears of the protesters. Its attempts to convince residents of the low risks of PX production after the protest, and the subsequent failure to relocate the plant, indicate that perceptions were still far from aligned.

Social factors: the interaction process

Decisions on the construction of the plant were taken by governmental actors, without the participation of residents. Only gradually did they become active. The role of new social media in this process provides an important explanation for the emergent framing of PX as dangerous and for the mobilization of residents (Huang and Yip 2012). The interactions of residents and activists using these new technologies were beyond the authorities' imagination. Since the latter did not participate in internet debates, virtual arenas emerged in an unrestricted, self-organizing way. In these arenas, connections with developments elsewhere, such as Xiamen, could be made, and activists and residents could freely express and interpret developments and events, thus influencing one another's frames. As the case description in the former sections shows, the virtual arenas of social media became the locus of the build-up of tension. In this context, an anonymous announcement of a mass meeting triggered a mass protest, in a flash-mob-like way, taking the authorities by surprise (compare Bekkers et al. 2011; Sullivan and Xie 2009). The protesters we interviewed said that there were no organizers and that they were activated by an anonymous announcement from social media (Interview with two protesters, 25 August 2011; 30 August 2011). This information was also confirmed by interviewees from the public security agency and the community agency (Interview with a policeman, 15 March 2012; a public servant working in community, 30 September 2011).

Once the mass protest occurred, local government was under pressure and had to find ways to calm people down. Because of the escalation of the conflict and the high level of distrust, drastic actions were required to accomplish this – hence the municipality's promise to stop the production of PX and to relocate the plant. This decision was 'easy and simple' to make, according to one of our interviewees (Interview with a policeman, 15 March 2012), but its feasibility was doubtful because of 'lack of financial resources' (Interview with a professor, 27 April 2012; a port expert, 30 May 2013; a public servant in the DMC, 13 May 2013; a public servant working for the office for petitions and appeals, 27 May 2013). The second proposition, on social factors, stated that, in order to resolve conflict, actors need to align their strategies. The analysis of the PX conflict shows that strategies were not aligned, but that the conflict escalated. As a result, it became hard to find a win-win solution. Instead, the municipality made drastic, but unfeasible, compromises to reduce tensions and restore social order.

Institutional factors: formal positions, fragmentation, and non-institutionalization

A number of institutional factors that influenced the process and its outcomes can be identified. First, the traditional way of closed decision making within a vertically coordinated multilevel network in which economic interests dominate provides an important explanation. Since government officials in China have formal obligations to their superiors

and not to citizens, they do not have much motivation to communicate with citizens on risks (Interview with a professor, 27 April 2012). SEPA's institutional position at that point was too weak to act as a countervailing, correcting power. This resulted in the decision to build the PX plant without involving or informing the public, although this was legally required, and without important risks being assessed. Second, the role of informal personal social networks, known as *Quanxi*, may have played an important role (compare Zheng, De Jong, and Koppenjan 2010). On the basis of our data, it is hard to assess) whether *Quanxi* contributed to opaque interest representation. However, in interviews, the protesters condemned the close relationships between the last governor and the Fujia entrepreneur and viewed this as the main reason why the risk assessment was not reliable (Interview with two protesters, 25 August 2011; 30 August 2011).

Thirdly, the formal positions of governmental actors and their legalist and hierarchical thinking are an important explanation for the absence of a response to worries, questions, and suggestions that residents and activists expressed in debates in the new social media. None of these governmental actors felt responsible for addressing these concerns. For the NDRC and the SEPA, the citizens' resentment was a local affair and they felt no responsibility for giving an explanation. The Dalian SASAC, as 'the leader of the program', thought that it had fulfilled its duties: the project was approved, the loan had been granted, and the economic aims were achieved (Interview with a public servant in the DMC, 10 June 2013.). Other regulating agencies, for instance the production safety supervision bureau, found it hard to take action, since the explosion in CNPC had no direct relation with the PX plant (Interview with a public servant in the DMC, 5 June 2013.). The DMC and Dalian Municipality focused mainly on the emergency management after the explosions and the dyke breach.

Fourthly, the fragmentation within the government apparatus hampered it from adequately dealing with the protest. Central government and some agencies within the municipality were strongly supportive of the PX plant, PX production being part of the national revitalization strategy. The governor who had to deal with the protest was not yet firmly nested in the network of actors involved in the planning and operation of the PX project. So, the failure to relocate the PX plant does not necessarily mean that the promise to relocate it was an insincere strategic move to reduce tensions in the short run; it may rather have been the result of uncoordinated action by various agencies at both the local and the central level of government.

A last institutional factor involves the nature of the protest and especially its lack of institutionalization (compare Yang 2005). No NGOs were involved. As one respondent indicated, the protest was an unorganized, spontaneous outbreak in response to anonymous summonses in the social media (Interview with two protestors, 25, 30 August 2011). This lack of organization and institutionalization made it hard to keep protesters mobilized, and to hold the municipality to its promises. One of our interviewees was wondering 'who will keep on with this protest? It is time consuming and nobody will be very enthusiastic about the task' (Interview with a public servant in the DMC, 5 June 2013). As a result, there was no institutional watchdog to hold the municipal government to its promises.

The proposition on the role of institutions stated that conflict resolution requires institutions that support interaction among actors. The analysis of the PX cases shows that various institutional conditions hindered the realization of a joint outcome that did justice to the interests and perceptions of the various parties involved.

The governance of the process

The way the involved governments at central and local level operated in the various rounds of the process had a major impact on the process and its outcome. When residents started to get worried about the risks to which they were exposed, no attempt was made to respond to their worries. Rather, attempts were made to prevent the crossover from internet debates to mass media, by forbidding publication and broadcasting. Once the protest broke out, rather than negotiating and looking for a win–win solution that would accommodate the various involved interests in an informed way, the governor and the DMC seem to have accepted the protesters' framing and simply conceded their claims. After the protest, the earlier information on social media was deleted, thus undermining conditions for the institutionalization of the protest (Interview with a port expert, 30 May 2013). Further activities by citizens regarding the PX plant were not considered legitimate since the municipality had made the relocation decision and fulfilled the protesters' requests. The citizens now had no legal excuses for further protest (Interview with a public servant working in community, 30 September 2011; a policeman, 15 March 2012).

The proposition on governance stated that negotiation, facilitation, and mediation strategies are needed to arrive at conflict resolution. The PX case study shows that the government's strategies lacked efforts at deliberation and negotiation, and were far from what the literature considers to be best practices for (environmental) conflict resolution or governance of multi-actor interaction processes (see Glasbergen 1995; van Bueren, Klijn, and Koppenjan 2003).

External events

As indicated above, a number of external events influenced the Dalian PX protest. The earlier successful protests in Xiamen contributed to Dalian residents' awareness of the risk of PX production and to the framing of the issue. As a result, the response to the fires in the petrochemical industry and the dyke breaches consequent to typhoon Muifa focused on the PX plant, ignoring the fact that the former incidents caused by risks present in other facilities within Dalian port. The proposition on the role of external events states that external events may influence the process of conflict resolution, without specifying the direction of this influence. This case, however, illustrates that these events, although influential, did not have a direct causal link with the protest, but were interpreted by actors in the debate.

Conclusion

In this contribution, we aimed to use the Governance Network framework to explain the process and outcome of the Dalian PX conflict. The application of the framework to the events surrounding the PX project in Dalian elucidates the difficulties that the relevant Chinese authorities experienced when dealing with environmental risks and conflicts. The way residents' concerns were handled did not prevent the escalation of the conflict, and the resolution of the conflict produced anything but a win–win solution; rather, it resulted in high costs for all parties involved. The analysis of the intermediate variable, the interaction process, shows the absence of dialogue and deliberation between residents and government. No attempts were made to actively influence the framing of the debate. First, residents were ignored and dissident voices were suppressed; later, the municipal

council simply accepted the residents' demands. Whether the concerns over the risks involved in PX production were justified remained unresolved. So, although eventually the PX production was resumed, it was done at considerable costs and in a way that did not benefit from the best practices suggested in the literature.

Guided by the propositions suggested by the framework, we have identified various factors and mechanisms that contributed to the explanation of the course and outcome of the process. These factors influenced and reinforced one another, resulting in a specific configuration of causal factors. In this case, the configuration was that of (1) the rise of a dominant unchallenged frame of the PX plant as highly risky; (2) the emergence of mass protest consequent to self-organizing debates in the virtual arenas of social media; (3) institutional factors resulting in procedures that do not allow for deliberation and participation, a division of responsibilities resulting in officials feeling not obliged to act, fragmentation resulting in uncoordinated government responses and the absence of NGOs; (4) a government engaged in suppression, or making unrealistic compromises, rather than governing deliberations and negotiations; and (5) unmediated triggering events. Identifying this configuration enhances the generalizability of this single case study, since it allows for comparison with the outcomes, processes, and configurations of casual factors in other cases, yet to be studied (see Ragin 1992).

This study has contributed to the further development of the Governance Network framework by demonstrating that it is helpful as an empirical tool to describe and explain policy processes and conflicts in a multi-actor situation in China. It has also identified factors – especially institutional factors – that are typical for the Chinese context. By introducing the idea of configurations of factors and specifying this configuration for the Dalian case, this study not only informs future studies in China, but also provides building blocks for international comparisons, contributing to the contextualization of the framework.

Of course, this study has its limitations. Especially the availability of data and data sources was limited. Although we succeeded in having interviews with actors within and outside government, the number of Chinese officials we were able to interview was limited, and we had no access to official internal documents. However, because we have supplemented our sources with documents, articles, and new reports available on the internet, we think that our empirical analysis is empirically well underpinned. Furthermore, given the scarcity of in-depth case studies of Chinese governance of environmental conflicts, it provides a relatively unique study of these practices.

From the analysis under the current framework, some observations can be made on the challenges that Chinese governments face. First of all, this study illustrates the relevance of multi-actor settings in the context of policy-making and governance in China. The institutional fragmentation that characterizes Chinese government calls for new ways to improve intergovernmental and intersectional coordination (compare Beeson 2010). In the absence of democracy and accountability to citizens, it is very hard to balance the increasing variety of values that the Chinese government has to accommodate. Although some authors suggest that involving residents in planning processes might be the Chinese pathway to balancing interests and gaining legitimacy (see e.g. Leonard 2008; He and Warren 2011), it remains to be seen which institutional incentives will encourage governmental officials to actually do so. Perhaps the further institutionalization of NGOs may be helpful to create institutional arenas for participation and to safeguard the implementation of negotiated outcomes. The growth of the Chinese middle class, with the accompanying shift towards concerns beyond economic prosperity, may enhance these developments. Furthermore, the growing importance

of the new social media, outsmarting the traditional control mechanisms that the Chinese government applies, may make it inevitable for the latter to open up channels for deliberation with residents. These developments are not unambiguous though. The Chinese government's response currently focuses on controlling social media, blocking their use in times of crisis, or entering virtual arenas to impose frames rather than to engage in dialogue. The introduction of social risk assessment is likewise an ambiguous development (see NDRC 2012). It may reflect a serious attempt to open up options for public participation, but it may also be an expression of the Chinese government's perception that risks stem from people rather than from technologies.

Notes

1. Three of the interviewees were civil servants from the DMC, two were from a public security agency in Dalian, one was working at a community agency, two were participants in the protest, one was a port expert, and three were professors from universities in Dalian.
2. It should be noted that the EIA report was compiled by qualified agencies chosen and hired by the applicants, rather than by a neutral third party.
3. The Chinese state has rather strict regulations about the number of participants in collective actions. Appeals that can be brought forward in the appeal system are required to have no more than five participants. In this case, the collective action with participants over 10 thousand (12,000 participants in this case) is an exceptional event that provides a considerable challenge to Dalian Municipality.
4. Local governments in China are authorized to censor content on the internet to curtail collective actions, especially right after large protests. The latest law draft Internet Security Law of the People's Republic of China (disclosed on June 2015) formally claims that, with the permission of the State Council, local governments can set temporary restrictions on network communication at times of mass crisis.

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