



Research article

The interaction between local governments and stakeholders in environmental management: The case of water pollution by SMEs in Thailand[☆]



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ABSTRACT

Small and medium-sized enterprises (SMEs) play an important and growing role in the economy, but they also contribute to negative environmental effects. It is often argued that local governments (LGs) would be better able than the central government to address these environmental effects. LGs can generate locally specific solutions and mobilize other local stakeholders. This article examines (1) how Thai SMEs respond to complaints about their industrial water pollution and (2) to what extent LGs have been able to address such environmental degradation. Thirty cases of industrial water pollution were investigated, and stakeholders (entrepreneurs, LGs, affected communities and NGOs) were interviewed about their actions and responses. We conclude that none of the stakeholders on their own make a significant contribution to the environmental outcomes. We present two cases detailing how enterprises, LGs and communities interacted with each other over time and how this interaction shaped the environmental outcomes. The responses of polluting entrepreneurs were driven by interaction between various stakeholders. This finding suggests that LGs alone cannot address water pollution, even if they have the authority and capacity. LGs need to interact with other stakeholders to pursue this task.

1. Environmental degradation in a world of small enterprises

It is increasingly being recognized that small and medium enterprises (SMEs)' economic contribution in terms of increasing production, employment and poverty reduction is accompanied by growing negative environmental impacts (Hillary, 1995, Petts, 2000, Schaper, 2002 and Welford, 1994 in Williamson et al., 2006). It has been estimated, for example, that in general, SMEs cumulatively create approximately 70% of all industrial pollution (Groundwork, 1995 in Tilley, 1999). Research has suggested that the environmental behaviour of SMEs is different from that of large enterprises. Owner-managers face multiple challenges in a highly competitive environment, reducing time and money available to address their environmental responsibilities (Friedman and Miles, 2001). For the same reason, they do not have enough resources for long-term business planning and are likely to postpone or forego long-term investments in environmental improvements. Their business decisions, including environmental decisions, depend mainly on the owners, and the owner's personal values and

attitudes play a key role in business decisions. Furthermore, as SMEs are heterogeneous, their environmental impacts are also diverse, making it difficult to generalize about solutions (Hillary, 2004). Entrepreneurs often believe that as their firm operations are small, they do not have a significant impact on the environment (William and Lynch-Wood, 2001 in Williamson et al., 2006). As a result, entrepreneurs are not willing to individually commit themselves to collectively improving their environmental performance. Their small size enables them also to escape government monitoring and media investigation.

Although SMEs are responsible for considerable environmental degradation, governments do not often address this problem. Governments may wrongly assume that small enterprises do not cause significant environmental problems due to their small size (Soni, 2007). Moreover, many developing countries, including Thailand, tend to give priority to economic growth even if this comes at the cost of the environment. If governments do give the environment priority, they tend to use a 'command and control' approach, which is 'to command people or firms not to do something by enacting a law that makes it

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illegal and delegating authorities to enforce such law through the imposition of fine or penalty to violators' (PIDS, 2002). However, such an approach does not work well when polluters are heterogeneous, large in number and informal (Eskeland and Jimenez, 1992). Transaction costs necessary to investigate and implement such 'command and control' policies are very high. Furthermore, this approach cannot work efficiently in areas where the government does not have sufficient investigative capacity and where public administration is weak in capacity and outreach (Eskeland and Jimenez, 1992).

Literature in this area states that stakeholders play an important role in environmental practices of SMEs. For example, the study of Rasi, Abdekhoodae and Nagaraja (2014) indicates that environmental decisions of SMEs in Malaysia are heavily influenced by interactions between stakeholders such as customers, employees and senior managers but not the government. Similarly, the work of Nejati et al. (2014) shows that micro-SMEs are significantly influenced by only employees and customers but not by the community, suppliers or shareholders. However, the situation is slightly different in Hungary since employees and large firms play a role in SMEs' environmental decisions (Nagypál, 2014).

Furthermore, supplier assessment of SMEs is positively influenced by international NGOs through the economic and environmental corporate social responsibility (CSR) dimension, while the relationship is the opposite through the social CSR dimension (Stekelorum et al., 2019). Liu, Zhang, Henry, Bu & Wang (2018) also emphasize that supply chain management requires considerable cooperation among multiple stakeholders such as NGOs, industrial associations and consulting firms.

If it is recognized that SMEs are substantially degrading the environment and if the central government is not able to address the problem effectively, could decentralization of environmental policies and management to LGs be an effective solution? After all, LGs is considered to be closer to the local people and therefore to better understand local circumstances and demands (Georg and Irwin, 2002), and the subsidiarity principle suggests that pollution by SMEs is a local problem that is best addressed by local actors. Compared to the central government, the LGs would be able to provide more tailor-made solutions to specific local environmental problems. Furthermore, the LGs does not need to address these problems alone but can invoke and mobilize/negotiate with stakeholders to collectively arrive at satisfactory solutions. This means that even if their direct capacity to formulate, monitor and implement environmental policies is limited, they can increase their effectiveness by mobilizing and negotiating with other stakeholders. Environmental management is then transformed from a LGs issue into a local governance issue.

In this article, we aim to examine (1) how Thai SMEs respond to complaints about their industrial water pollution and (2) to what extent Thai LGs have been able to address environmental degradation caused by small enterprises. In this regard, we look at LGs itself as well as its interaction with other local stakeholders, extending the analysis to local governance. To this end, we begin by way of context, in Section Two, to outline the LGs system in Thailand and its role in environmental management. In Section Three, we elaborate our research design and we report on our findings of the key actors: SMEs, LGs and local communities. In Section Four, we focus on an in-depth stakeholder analysis of the interaction between local actors in two selected cases, and in the final section, we draw conclusions.

2. LGs and environmental management in Thailand

LGs (LGs) in Thailand are defined by the national constitution. The LGs administration is divided into two main categories: general and special. The general category encompasses (1) provincial administrative organizations (PAOs), (2) municipalities (*thedsaban*), and (3) *tambon administrative organizations* (or TAOs), while the specific category covers (4) the Bangkok Metropolitan Administration (or BMA) and

(5) the city of Pattaya (Haque, 2010).

The political and administrative structure of Thai LGs is regarded as 'a mayoral-council form' (Krueathep, 2010), which comprises the legislative branch (a council) and the executive branch (a LGs chief elected by voters) (Wikipedia, 2019).

Thailand's local governing system can be described as a 'dual system' (Nagai and Kagoya, 2008) that comprises the local administration (deconcentrated) and local autonomous self-government (decentralized) (OECD, 2016). At the local administration level, the municipality and TAO are directly responsible for the local environment. The PAO supports the TAO and municipalities when their tasks overlap. However, scholars have argued that LGs in Thailand are still 'highly centralized in authority but decentralized in function, by ways of devolving powers to local authorities' (Nagai and Kagoya, 2008).

The first decentralization plan (2001–2006) stated that six service programmes incorporating 245 responsibilities that were originally managed by the central government should be transferred to the LGs (Krueathep, 2010). These services also include natural resource and environmental factors: forestry, land and water preservation, pollution control, natural resources management, and environmental protection. By the end of this first decentralization plan, 181 responsibilities from six service programmes had been transferred to the LGs, including natural resources and the environment. By the end of the second decentralization, 76 of 114 responsibilities had also been transferred to the LGs. The first decentralization plan transferred responsibilities for waste management and building environmental networks in local areas. The second decentralization plan transferred the responsibilities of preserving forests and natural resources, which includes restoring the environment in the reformed area and coastal area and the law enforcement of pollution control, improving environmental quality and the Public Health Act. The first decentralization plan also stated that natural resources and environmental tasks should be transferred to the LGs. To carry out these tasks, LGs must monitor the point sources of pollution such as factories and enforce relevant laws if the parties were acting illegally (Wattanapinyo, 2006). With the Public Health Act of 1992, the enforcement of environmental policy was decentralized to the LGs.

Diagram 1 below illustrates how the government in Thailand manages local environmental tasks in relation to enterprises.

It is important to note that a distinction is made between registered and unregistered enterprises. The LGs has the authority to enforce the Public Health Act of 1992 in relation to unregistered (informal) enterprises if a nuisance is caused. Registered factories are regulated by three different laws enforced by three different public agencies: the Ministry of Industry with the authority to enforce the Factories Act of 1992, the Ministry of Natural Resource and Environment with the authority to enforce the Enhancement and Conservation of National Environment Quality Act of 1992 and the LGs with the authority to

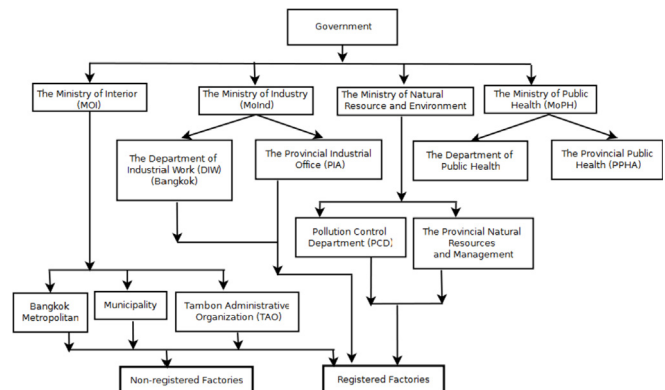


Diagram 1. Institutional structure of local environmental tasks, Source: Adapted from Wattanapinyo (2006).

Table 1
Influential factors, sub-factors and sources of information.^a
Source: the data of the author' thesis.

Influential factors	Sub-factors	Sources of information
SMEs		
External economic factors	Internationalization and reputation	Structured question in questionnaire
Financial costs of damage		Structured question in questionnaire
Owner	Ownership structure and the owner's personal attitude	Structured question in questionnaire; open ended question, classified afterwards
Organizational characteristics	Organizational characteristics, operational management and R&D	Structured question in questionnaire
Available resources and expected benefits	Resource availability and expected benefits	Structured question in questionnaire
Local government		
Institutional set-up		Structured question in questionnaire
Leadership	Style and quality	Structured question in questionnaire
Capacity	Planning capacity, Financial capacity, Technical capacity and Capacity to convene	Structured question in questionnaire; open ended question, classified afterwards
Relationship between local government and business	Whether a business is only a tax payer or the clan family of a local government chief	Open ended question, classified afterwards
Local community		
Resource system characteristics	Stationary and available water storage	Open ended question, classified afterwards
Degree of the problem	Impact of water pollution and size of affected groups	Structured question in questionnaire; open ended question, classified afterwards
Local community leadership	The response of local chiefs towards the water pollution issue	Structured question in questionnaire; open ended question, classified afterwards
Social capital	The relationship within a community	Structured question in questionnaire; open ended question, classified afterwards
Self-organizing capacity	Participation style, communicating approach within the community and the existence of local meetings to address the problem	Structured question in questionnaire; open ended question, classified afterwards
Local people's dependency on local firms		Open ended question, classified afterwards

^a The interested reader should consult the large study.

enforce the Public Health Act of 1992. We will concentrate on the Public Health Act of 1992, which is the main instrument of the LGs in relation to both registered and unregistered enterprises. For details of the other acts and ministries, we refer to https://www.jetro.go.jp/thailand/e_activity/pdf/minreg2.pdf and [http://portal.mrcmekong.org/assets/documents/Thai-Law/Enhancement-and-Conservation-of-National-Environmental-Quality-Act-\(1992\).pdf](http://portal.mrcmekong.org/assets/documents/Thai-Law/Enhancement-and-Conservation-of-National-Environmental-Quality-Act-(1992).pdf).

The Public Health Act of 1992 authorizes the LGs to ensure that local entrepreneurs do not pollute the environment. Section 26 of this law states, 'the local official shall have the power to prohibit any person from causing nuisance in a public place, way, private place and also to abate nuisance'. This authority includes overseeing, improving, and maintaining roads, land routes, waterways, drainage, trenches, canals, and other places within his/her jurisdiction to ensure they are free from nuisance. In this regard, the local official has the power to issue written orders to abate, eliminate, and control nuisances. If polluting entrepreneurs do not follow the instructions of the LGs, they will be fined and/or sentenced to prison. The LGs is authorized to control harmful businesses. These businesses have to ask for legal permission and certification before they can continue their business and need to ask for an extension of this permit every year. This process allows the LGs to monitor the businesses and their environmental improvements.

In conclusion, the LGs system of Thailand is a dual one, in which the central government has considerable local reach. The LGs has full responsibility in relation to informal unregistered enterprises but has a shared responsibility with two sector ministries in relation to registered factories. The Public Health Act empowers the LGs to act on environmental pollution and gives it clear legal instruments. The question that we seek to answer is to what extent LGs, in the institutional context described above, are actually willing and able to act on environmental pollution. In the next part, we will turn to this question.

3. Research methodology

To answer our research questions, we sampled 30 cases of industrial water pollution from across Thailand that appeared in the provincial and national press in the period 2005 to 2007. These 30 cases are found

in an urban area (*Bangkok*), three peri-urban areas (*Ayudhaya*, *Nakornpathom*, *Chacherngsao*) and one rural area (*Naronratchaseema*).

3.1. Primary data

In each case, using semi-structured questionnaires, we surveyed a) the responses of the SMEs identified as causing the water pollution and the factors explaining their responses; b) the actions by the LGs of the area and the potential range of factors that explain their capacity, ability and willingness to act; and as well as c) the local communities concerned in the area affected by the water pollution, their degree of organization and management to engage the LGs and the polluting enterprises.

3.2. Secondary data

Secondary data supplies information about plans, research, laws and budget in relation to stakeholders' environmental influence and SMEs' environmental performance. The information will assist the researcher to comprehend and confirm the stakeholders' environmental reactions.

3.3. Scales of measurement

This article uses ordinal scales to categorize data from the fieldwork because the fieldwork uses questionnaires to obtain information from key actors. This article uses the scale of high, medium and low to measure the relative influence of key actors' underlying factors. The article assigns interval scales to its ordinal scale of the data thus: high = 3, medium = 2 and low = 1. This approach was chosen as the article needs to use the SPSS statistical program to run a cluster analysis. SPSS requires a numerical input. Therefore, a numerical scale is necessary to represent the ordinal scale. In addition, some underlying factors have two or three sub-factors where the results have to be summed up in one single indicator. Using a numerical scale gives clear results of the summation from all sub-factors.

Table 1 below summarizes the influential factors, sub-factors and sources of information (see Tables 2–5)

Table 2

The relationship between motivation of the entrepreneur and level of improvement by their enterprise.
Source: the data of the author' thesis.

Motivation of the entrepreneur ^a	Move or close down	Level of partial improvement	Full improvement	Recycle or re-use
Low	5	3	1	0
Medium	1	4	2	6
High	1	5	2	0

^a High motivation is the concern for affected stakeholders and personal concern about the environment, while moderate motivation is a mixture of concern for affected stakeholders and concern for the economic, legal and business consequences. Low motivation is the concern for economic gain, legal compliance and business reputation.

Table 3

Chi-square tests.
Source: the data of the author' thesis.

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	10.544 ^a	6	.104
Likelihood Ratio	11.247	6	.081
Linear-by-Linear Association	2.578	1	.108
N of Valid Cases	30		

^a . A total of 11 cells (91.7%) have an expected count less than 5. The minimum expected count is .67.

Table 4

Environmental management capacity of local governments and level of environmental improvement by the enterprises.
Source: the data of the author' thesis.

Capacity of local government	Move or close down	Level of partial improvement	Full improvement	Recycle or re-use
Low	1	6	1	4
Medium	0	2	2	0
High	6	4	2	2

Table 5

Chi-square tests.
Source: the data of the author' thesis.

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	10.544 ^a	6	.104
Likelihood Ratio	11.247	6	.081
Linear-by-Linear Association	2.578	1	.108
N of Valid Cases	30		

^a . A total of 11 cells (91.7%) have an expected count less than 5. The minimum expected count is .67.

In addition to this actor-centred analysis, we then examined in two detailed case studies how enterprises, LGs and communities interacted with each other over time and how this interaction shaped the environmental outcomes. The field research was conducted in the period 2009–2011.

4. Actors involved in water pollution problems in Thailand

Stakeholder analysis is used as the analytical tool for this article. A stakeholder, as defined by Freeman (1984 as cited by Mitchell et al., 1997), is 'any group or individual who can affect or is affected by the achievement of the organization's objectives'. The main actors in this article are entrepreneurs, the LGs and the local community, while NGOs and business associations are only involved in a few instances.

4.1. Nature of water pollution and enterprise level responses

The most common polluting behaviours of the surveyed enterprises

were (1) discharging wastewater into public water sources (20 cases), (2) discharging wastewater into public culverts (8 cases), (3) discharging wastewater into surrounding areas (3 cases) and (4) polluting accidents (6 cases). The most common forms of pollution in peri-urban and rural areas were accidents and discharging wastewater into public water sources, whilst in Bangkok, the main form was discharging wastewater into public culverts, public water sources and surrounding areas. Of the 30 cases of pollution examined for this thesis, nine cases produced a high level of pollution, which were caused by rice mill, starch and sugar enterprises, whose BOD¹ coefficients are 22, 52 and 13, respectively. These incidents seriously affected the agriculture of more than 100 households and made it impossible for some local people to draw water from public water sources, even for general use. The remaining instances of pollution affected only 5–20 households and were caused mainly by micro-entrepreneurs. This finding confirms that most small enterprises cause relatively little environmental impact.

What did the enterprises do when confronted with their polluting behaviour? What was the outcome of the process?

We classified the responses of the enterprises into four categories:

- i) relocating the business or ceasing business operations (7 enterprises);
- ii) partial environmental improvement, which occurs when entrepreneurs try to improve their environmental performance but still produce pollution (12 enterprises);
- iii) complete environmental improvement, which occurs when entrepreneurs fully treat their wastewater before it is discharged into public water sources (6 enterprises); and
- iv) re-using/recycling wastewater (5 enterprises).

To explain these environmental responses on the part of the enterprises, we looked at the existing literature and we examined the following factors: (1) the owner's attitude towards environmental issues, (2) the organizational characteristics of the enterprises, (3) external economic factors, (4) the financial costs of damage, and (5) their available resources and expected benefits of environmental investments. Our findings suggest that each of these factors is applicable to some of the firms. For example, entrepreneurs who are more influenced by external economic factors (e.g., exporting) are more likely to improve their environmental performance. Similarly, better organized enterprises (with environmentally competent employees, a formal system of operations and research and development) are more likely to improve their formal operation system to improve environmental performance. Not unexpectedly, entrepreneurs facing high and medium financial costs of damage only partially improved their environmental performance, while entrepreneurs facing low financial costs as a result of the damage they caused improved their environmental performance completely. This pattern results from several factors such as the environmental influence of the LGs and the local community. With

¹ BOD is the abbreviation for biochemical oxygen demand, which is a measure of how much dissolved oxygen is consumed by aerobic bacteria in 5 days at 20 °C (Abdalla and Hammamb, 2014).

regards to the owner's personal attitude, this study confirms the findings of previous literature that argued that internal motivations drive SMEs to improve their environmental performance (Spence, 2001 as cited by Dao and Ofori, 2010). It should be stressed, however, that the sample is too small to draw statistical inferences.

Nonetheless, the findings do not wholly reflect the results in the literature since the motivation to improve environmental behaviour among small and micro-firms derives from compliance with the law rather than a concern for other stakeholders and businesses. Finally, the findings on available resources and expected benefits suggest that most firms cannot expect financial returns on their environmental investment, particularly in the short term, and that some do not have sufficient resources to invest in environmental improvement. For firms that responded by re-using wastewater and by making partial improvements, it is clear that firms with more available resources and higher expected benefits are more likely to improve their environmental performance. In contrast, however, entrepreneurs who made complete environmental improvements and those who stopped their business *did not* conform to the proposition.

Overall, these findings suggest that there is no one-to-one correspondence between enterprise-level factors and the responses by polluting entrepreneurs. A single set of factors alone cannot explain their environmental response. Thus, there must be other factors influencing SMEs' environmental response such as those related to the influence of other stakeholders. The next section will explain the findings on the roles of LGs and local communities.

4.2. Local government responses to water pollution by SMEs: capacity versus responsibility

We examined four sets of factors that can shape LGs's environmental decisions: institutional set-up, leadership, administrative and technical capacities and business-LG relationships. Starting with institutional set-up, the research revealed that the legal authority of the Public Health Act is rarely decisive for a LGs to take action. LGs shy away from taking a hard legal approach. This behaviour is also confirmed by our findings in relation to the leadership styles dominant in LGs. LGs leaders tend to prefer administrative approaches to solve local environmental problems, i.e., reacting to community complaints and coordinating their actions with other governments, as well as informally requesting that the polluting firms in question address the problem. In addition, LG leaders tend to shy away from politics to influence environmental issues as they are uncertain about how this might affect their future political position. An important factor is the lack of capacity of LGs to address incidents of water pollution, e.g., to determine its source(s), as we will see below. This lack of capacity also explains why LGs prefer to seek support from (higher-level) government agencies on which they formally depend or that have greater legal authority (e.g., the Factories Act) and are technically better equipped.

With regard to the capacity of LGs to act, we looked at their financial capacity to sustain a budget to implement their environmental responsibilities, as this is often a limiting factor (Carrol, 1989 as cited by Kassinis and Vafeas, 2006: 150). Financial capacity is measured by the ratio of the LGs's own revenue to its total revenue, the environmental budget per capita, and the ratio of environmental budget to total budget. There is no correlation between the financial strength of the LG and its ability to influence entrepreneurs to make environmental improvements.

When we examined all aspects of LG capacity (planning, finance, technical competency and ability to convene other actors²), we found

² High planning capacity exists when the LGs implements an environmental policy during the study period. High technical capacity exists when technical staff is employed by the LGs. High capacity to convene is when the LGs is able to mobilize other government sectors, NGOs and community-based organization

that almost half of LGs (14) have a high capacity, 12 LGs have low capacity, and four LGs have medium capacity.

There is no evidence of a positive correspondence between the capacity of LGs and the improvement responses by polluting entrepreneurs. Nonetheless, the sample is too small to draw statistical inferences, but it is clear that without financial and technical capacity, it is difficult for LGs to enforce the law.

However, are LGs *willing* to enforce the law? In that regard, we examined whether there was a relationship between the LG and the entrepreneur in question. We distinguished two types of relationships of influence. The LG has a low influence on an entrepreneur if it is a taxpayer and a clan or family member, a political supporter or an important local employer. If an entrepreneur is only a local taxpayer, then the LG can have a higher influence. We find that in rural and peri-urban areas, LGs tend to have a limited influence on polluting entrepreneurs, as there are close interdependencies between them. In Bangkok, the opposite is the case. We find that in the latter case, the LG will monitor the firm's environmental behaviour and demand improvements. In contrast, if LGs are closer to local entrepreneurs, they tend to avoid a direct confrontation. In fact, these LGs are more likely to coordinate with other government agencies and ask these agencies to instruct local entrepreneurs to improve their environmental performance. Nonetheless, the research cannot conclude that the environmental reactions of LGs are driven by this factor alone since there are other relevant factors affecting the environmental decision-making of the LGs.

The reciprocal network and relationship between the LGs and polluting firms can also be a cause of corruption: polluting firms pay bribes to government officers to avoid strong law enforcement (LGs, the Provincial Industrial Office and District Offices in Bangkok). This likelihood is supported by GAN (2019), indicating that in Thailand, one in six companies suggest that 'they expect to give gifts to officials to get things done'. One of our interviewees who worked at the polluting firm also stated that '*after the officer investigated the factory, I was waiting for them (the officers) at the gate and gave them an envelope (with money)*'. The consequence of this corruption is a distortion of the level of environmental influence exerted by authorized officials. For example, corrupt officials may react slowly to complaints, avoid enforcing the law on polluting firms and warn polluting firms when they are to be monitored so that they have time to hide evidence. This type of corruption exists mostly in rural areas with larger medium-sized firms, which are relatively affluent and may threaten to use their resources politically and thus influence LG decision-making.

Overall, we can conclude that LGs with sufficient authority do not necessarily want to enforce the law on polluting entrepreneurs due to their political concerns and poor technical capacity to identify the source of pollution. Moreover, most LGs leaders use an administrative style of leadership to address environmental problems. Because they are legally obliged to address such problems, an administrative approach makes it possible for their actions to be checked by others and for the LGs to show that it has undertaken some action. Nonetheless, the quality of LGs leadership shows no relationship with the degree to which SMEs have addressed water pollution. In addition, planning and financial capacities highly influence LGs decision-making, particularly in areas where water is used mainly for agriculture.

Finally, our research shows that LGs have unequal levels of influence on the polluting entrepreneurs. We distinguish among three

(footnote continued)

to address the environmental pollution, while low capacity to convene denotes the situation where only the LGs and affected people are involved. High financial capacity exists when (1) the ratio of the LGs's own revenue to the overall revenue of the LGs is higher than 8%, (2) when the average ratio of the environmental budget to the size of the population is higher than 50 baht and (3) when the percentage of budget spent on environmental tasks to the overall budget is higher than 1%.

groups. First, certain LGs are active, such as the district offices in Bangkok. They are authorized to enforce the law on polluting firms and have sufficient ability to do so. When these LGs receive reports about water pollution, they monitor the situation, make suggestions for improvement and, if necessary, enforce the law on polluting entrepreneurs, with the result that entrepreneurs either close down their firm altogether or relocate their business elsewhere. The second group comprises LGs, which do not actively influence polluting entrepreneurs. These LGs tend not to have active leaders, strong capacities or authority. This group clearly shows that when the LGs does not have sufficient power and ability, it is not able to influence polluting entrepreneurs, even small ones, to improve their environmental behaviour. The third group of LGs does not show a clear pattern in most of their underlying factors, with the exception of institutional setup and administrative style of leadership.

Our overall conclusion is that there is no systematic relationship between the LGs and SMEs' environmental improvements. Neither the LGs' capacities, authority and leadership nor their relationship with polluting entrepreneurs can explain the environmental responses by polluting entrepreneurs. If we cannot establish LGs' effectiveness in environmental management vis-a-vis water-polluting firms, might the community's role in local governance be the missing link? This question leads us to examine factors that can explain community-based collective action to fight environmental pollution by SMEs.

4.3. Local community: collective action versus personal benefits

To examine the effectiveness of community collective action, we examined six factors, namely, the characteristics of the water resource system on which a community draws for its daily water needs, the scale of impact of the pollution on the community, local community leadership and self-organizing capacity, the importance of social capital, and the economic dependence of the community on the polluting firm.

Our research confirms that local communities are more likely to participate in collective action when they rely heavily on one particular public water source (Lam, 1998: 66) and when the impact of pollution is extensive (Hechter, 1987 as cited by Lam, 1998).

Although the sample is too small to draw statistical inferences, Table 6 suggests that community self-organizing capacity influences enterprise responses (see Table 7).

However, in contrast to the findings reported by Araral (2009), local people do not start a new institution when resources are significant. In fact, very few local communities in our sample tried to organize a new institution to react to a pollution problem. Along the same line, communities with high levels of social capital and of self-organization do not organize themselves for environmental action or have appropriate environmental norms and values to react against industrial water pollution. This finding is in contrast with those of certain other studies, such as Pretty and Ward (2001: 211), who argued that a local community with high social capital will create new norms and values in relation to new problems.

To address water pollution, Thai local communities use their social capital to negotiate with polluting entrepreneurs for environmental improvements by communicating with each other about the problem

Table 6
Local communities' self-organizing capacity and level of environmental improvement by the enterprises.
Source: the data of the author' thesis.

Capacity of local community	Move or close down	Level of partial improvement	Full improvement	Recycle or re-use
Low	7	5	2	2
Medium	0	2	3	0
High	0	5	0	4

Table 7
Chi-square tests.
Source: the data of the author' thesis.

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	18.415 ^a	6	.005
Likelihood Ratio	20.660	6	.002
Linear-by-Linear Association	4.880	1	.027
N of Valid Cases	30		

^a A total of 11 cells (91.7%) have an expected count less than 5. The minimum expected count is .83.

and by calling for direct collective action—demonstrations to protest against the pollution. Local people who communicate extensively with each other can more easily be brought together to protest against a problem than those with less social capital, but even when there is strong social capital, it is necessary to have a community leader to organize the protest. This condition highlights the main characteristics of local communities found in this study, namely, that local communities are more likely to find a solution if there is a strong local community leader or, even better, a strong LGs leader to whom they can appeal rather than when local people are left to develop their own collective action. One of the reasons for this is the 'superior-inferior' relationship whereby local people, the inferior actor, always expect a leader or the government, the superior actor, to solve their problems for them. The inferior actor regards the government as 'a body possessed ideally of the attributes of a strong, wise but indulgent father' (Rubin, 1973: 425). Moreover, the inferior actors need to show their respect to the superior, while the superior must be generous and considerate towards the inferior actors (Kuwinpant, 2002). In Thai society, each person has his/her own position in the hierarchy based on his/her characteristics (age and gender) and background (wealth, power and education) (Kuwinpant, 2002). In other words, Thai culture has a high power distribution in which subordination depends heavily on bosses (Hofstede, 1991, as cited by Thanasankit and Corbitt (2000)), which means that 'only those at the top can possibly make decisions; that is their obligation, to operate as "fathers"' (Thanasankit and Corbitt, 2000). This leads to a situation in which affected villagers wait for a local chief or government officers to solve their problems or to lead them to address their own issues. In addition, local people perceive that it is a company that pollutes water, not they themselves. Therefore, they do not need to create and enforce community-based environmental rules. Moreover, without assistance, local communities cannot identify the extent and source of water pollution because they may not have sufficient knowledge on how to do so.

Patron-client relationships also play a role in how a local community reacts to pollution. Local people often work with polluting firms or sell their crops to them, suggesting an imbalance in the relative power between polluting firms and local people. This puts polluting firms in the role of a patron that is able to guarantee the economic livelihoods of local people, who, in turn, become the client in this economic relationship. Polluting firms, the patron, may demand reciprocity from local people who want to work with them. Local people, the clients, have to secure their jobs or their markets and thus will not react to the pollution. Such a patron-client relationship can continue for a long time (Scott, 1972: 95). For instance, the survey showed that a polluting firm that supported certain local people in the past and did not immediately ask for anything in return, was 'rewarded' by them at a later time when they did not complain about pollution, although they were affected by it. One of the interviewees explained that 'the owner of the factory gave my parents a loan. I do not want to file the complaint against them'.

One conclusion is that community collective power does not automatically emerge in response to SMEs' water pollution. Moreover, such pollution does not automatically translate into organized actions to address it. There is no one-to-one relationship between the local community and polluting entrepreneurs' environmental responses. The

community's collective power in relation to environmental problems needs to be considered in the context of other socioeconomic factors such as local culture, local economy and local politics.

This finding confirms Rowley's proposition that entrepreneurs do not respond to particular factors or stakeholders but 'to the interaction of multiple influences from the entire stakeholder network' (Rowley, 1997: 890). Therefore, we have to look at all stakeholders, the firm itself and their interactions as they have developed over time to understand the environmental responses by water-polluting firms. This brings us to the second part of our research.

5. Stakeholder analysis of local governance in environmental management

In this section, we present two in-depth case studies to examine the interaction over time among the various local actors. These two cases were selected because most of their basic factors concerning the enterprise, LGs and the community have similar levels of influence. However, in the first case, the LGs has low capacity but does interact with other stakeholders, resulting in the polluting company reusing wastewater. In contrast, in the other case, the LGs also has low capacity but does not interact with other stakeholders, and the firm does not fully improve its environmental performance.

5.1. Starch and potato-drying company

The starch company is a single private firm with a formal operational system to manage its business. Water pollution emerged a few years after the company started operating in the area in 2004 due to insufficient water retainers. As a result, wastewater was discharged into nearby public canals when it rained. In addition, the public water source in question is a lake, which is a closed system from water does not flow in and out every day. Therefore, the lake collected waste and wastewater from starch production, causing serious water pollution. This illustrates the large influence of the resource system characteristics. Water pollution caused a serious impact to local people because the water source was used to supply piped water to two villages. The dirty piped water was too contaminated for general use. The polluted water also killed aquatic creatures and caused a very unpleasant smell, disturbing local people. These considerable problems incurred a large financial cost due to damage.

A crisis in the pollution level arose in 2008. The LGs, after having received complaints, responded by holding a meeting with local people to discuss the problem. It reported the pollution incident to the district office (*Amphoe*). As the company was located outside its jurisdiction, the LGs did not have the authority to address the pollution itself. Since the affected LGs did not have environmental capacities to address industrial pollution, the LGs had to solve the problem administratively by reporting the problem to the higher-level district office and establish a committee to address the problem.

After the coordination between government sectors, there was a scientific investigation to examine the cause of the pollution. The report concluded that *'the test cannot scientifically specify that water pollution was caused only by the starch company because the amount of wastewater from the starch company alone could not pollute the whole lake'*. With this result, the government could not take legal action against the company. The district office attempted to organize meetings with the company and relevant government sectors and assigned the LGs to address the problem. However, the only existing solution at that time was to pump the wastewater out. Within one year, the water in the lake became polluted again. The polluting company reacted by introducing an EM (effective microorganism)³ to the water to improve its quality, but the

EM could not significantly improve the water quality because it was introduced in insufficient amounts for the large volume of water in the lake.

In 2009, the local public water source had become polluted again. Therefore, the LGs chief contacted and sought support from advocacy NGOs. The advocacy NGO called 'Local people of Four Regions Network' agreed to assist the LGs, indicating the importance of a network among the LGs and other stakeholders to create an additional means of solving a problem. The NGO encouraged local people to recognize their rights and activate their sense of ownership of the public water source. The NGO met with LGs leaders and other local community leaders and concluded that the provincial government should be approached to take legal action against all the polluting firms. One month after the meeting, the LGs, with the assistance of the advocacy NGO and local community chiefs, led 500 affected local people in a demonstration to the provincial office and submitted the complaint to the provincial governor. This action indicates the substantial influence of the local community chief, the strong self-organizing capacity and the moderate social capital present in the community. The LGs wanted to use this protest to gain attention from the authorized government to enforce the law on the polluting firms.

The provincial government responded to the protest by ordering the starch company to close for seven days. In addition, the provincial government set up a committee to find an immediate solution. Possible solutions were, for example, to build a bypass system to divert the flow of the wastewater away from the public water source, to improve the piped water production system, and to order the starch company to build more wastewater containers.

Follow-up meetings were organized to further develop the response by the polluting firm, the LGs and other government sectors. For instance, a bypass system was built at the company's expense, and the piped water system was improved. The starch company also built more wastewater retainers and changed its wastewater treatment system to a biogas system that extracted methane gas from the wastewater to generate electricity.

The responses by the company came about not only because of the pressure exerted by the local community, the LGs, the central government and the advocacy NGO but also because the company had the organizational capacity, such as environmental expertise, to improve its environmental performance. Furthermore, the company could use the new wastewater treatment system to reduce its electricity costs by generating its own electricity.

5.2. Ethyl alcohol company

The second case concerns a company that started operating in 1992, producing ethyl alcohol to be used as a solvent. The solvent was sold without a brand name, indicating low influence from external economic or market factors. The entrepreneur initially used potato as an input material to produce ethyl alcohol. However, in 1997, he switched from potatoes to molasses as the main input source. This change caused air pollution since wastewater could not be fully treated by the existing wastewater treatment system and released a very bad smell. As a result, local people complained to the provincial industrial department, which took legal action and ordered the company to close and improve its environmental behaviour. The company reacted by changing the wastewater treatment system to an anaerobic system that could reduce the strong smell from the wastewater, although some households (< 100 households) were still affected.

Local people responded to the air pollution first by reporting it to their local community chief, who filed a complaint with the LGs and with the district office on their behalf.

³An **effective microorganism** (EM) refers to "any of the predominantly anaerobic organisms blended in commercial agricultural amendments,

(footnote continued)
medicines and nutritional supplements" (Wikipedia, 2015).

After the first legal action, the company was reopened and started operating again, although it continued to pollute both the water and air in the local area. In 2003, the company produced its ethyl alcohol without a sufficient number of wastewater retainers, directly discharging wastewater into a public canal and thereby damaging nearby agriculture. At that time, the LGs was not authorized to enforce the law in this case as the central government's decentralization plan had not yet taken effect. The LGs therefore reported the pollution problem to the industrial department of the provincial office.

The industrial department of the provincial office ordered the company to temporarily close again to make further environmental improvements. The company responded by buying more land around its factory to build more wastewater retainers. During this time, the LGs monitored the environmental performance of the company and reported to the industrial department. Nonetheless, the lack of power and capacities of the LGs reduced its role to that of a mere monitoring body instead of being an environmental problem-solver.

Despite the company's improvements, local people were still affected, as the company still discharged wastewater into the public water source, seriously affecting agricultural production in the area. However, the number of affected farmers was now lower. In addition, more local people started working for the company (high dependency on firms), and this reduced their willingness to complain about the pollution.

Despite the efforts of the company to build more wastewater ponds in 2003, in 2006, high floods overflowed these wastewater ponds, and wastewater flowed onto local agricultural farms again. The water pollution caused by the company extensively damaged the agricultural areas of local farmers. At this time, the local chief, whose farm was also ruined, reported the problem to the provincial industrial office (indicating strong influence from the local community chief and the high social capital and self-organizing capacity). The industrial officer reacted by monitoring the pollution and agreed with the farmers that the water pollution was caused by the company. As a result, the company was forced to close again and was fined for discharging wastewater into the environment.

Since then, the company has made efforts to improve its environmental performance by building higher wastewater retainers to reduce the amount of discharged polluted water, but the company still discharged wastewater from another part of its production unit, polluting some of the nearby rice paddy fields of 2–3 farmers during the rainy season every year. The farmers did not seek to mobilize community collective action as they were too few in number and would not have much impact on the firm's environmental behaviour. For the company itself, there were few benefits to be gained from further environmental improvement.

In 2010, the company further improved its environmental performance by investing with another company to build a plant producing biogas. With this investment, the company would expect higher profits. As of April 2013, this new company was not yet in operation and wastewater was still being discharged and polluting a few local farmers' farms.

6. Discussion

This article sought to answer two questions: (1) How do Thai SMEs respond to complaints about their industrial water pollution? (2) To what extent have LGs been able and willing to address environmental degradation caused by SMEs? Thirty cases of industrial water pollution were studied, and relevant stakeholders (LGs, local communities and entrepreneurs) were interviewed about their actions and responses. We then examined in two detailed cases how enterprises, LGs and communities interacted with each other over time and how this interaction shaped the environmental outcomes. The advantages of this methodology is the findings and two contrasting cases illustrate how the LG

and local community can address their local water pollution problems despite poor capacity. In addition, the interaction between stakeholders reveals that each stakeholder's environmental influence should not be considered alone because it might lead to a wrong understanding about their capacity and influence. Nonetheless, we are aware that the number of cases is small, from which it is difficult to generalize.

On this basis, we can distil three main points for discussion. First, our findings on LGs are similar to those reported in the literature, namely, that most LGs still do not have sufficient capacity to influence polluting firms to improve their environmental performance. LGs, particularly in rural and peri-urban areas, still need to rely on the central government agencies to monitor the environment and to enforce laws on polluting firms. That same literature claims that the key to improved environmental performance is to strengthen the environmental management capacity of LGs. Our findings suggest, however, that even if LGs's capacity and authority are strengthened, this does not automatically result in improved firms' environmental responses.

Two cases indicate that in developing countries such as Thailand where LGs have poor capacity and local community are weakly organized, LGs can be successful in improving water pollution by convening other stakeholders to address the issue.

Second, the answer to the question as to whether the LGs can manage the environment in relation to SME water pollution is that the LGs alone is not always successful in managing such water pollution even if they have the authority and capacity. The findings show that the LGs needs to interact with other stakeholders to pursue this task, but it also depends on how the LGs interacts with other stakeholders and with whom they interact. If the LGs has to deal with powerful firms, the LGs tends to be more successful in influencing them when coordinating with other stakeholders who have more power to counterbalance that of powerful firms. It can be generalized that when there is more than one stakeholder, there is no one-to-one relationship between stakeholders' influencing factors and the reaction of the stakeholder to the situation. There is also no one-to-one relationship between the final outcome and the capacity of one single stakeholder. The reason is that other stakeholders also play a role in influencing polluting entrepreneurs, and it is the interaction between stakeholders that shapes the response of the polluting entrepreneur.

Finally, stakeholder analysis can be used to analyse decentralization in natural resource management because 'decentralization establishes a political space in which diverse actors must continually reconcile the ecological and social realities of local natural resource management with the administrative and political structures of the government' (Benjamin, 2008). Our findings show that stakeholder interaction, particularly made possible by LGs's enabling policies and efforts, is one of the factors for achieving decentralization in environmental management. This finding suggests that different actors, their interests and their relationships need to be identified (Grimble and Wellard, 1997) in searching for patterns of interaction and various types of solutions and interventions.

7. Limitation of the study and future research

The research was limited by time and budget since it was the thesis that needed to be finished within a certain period of time with a small amount of fund. This limitation resulted in a small number of cases. The future research should consider game theory as the methodology because it can thoroughly analyse the action and decision of each stakeholder.

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Annex

Profile of cases.

Case	Starch company	Ethyl alcohol
Level of environmental improvement	Reuse	Partly
Location	Rural	Peri-urban
Enterprise factors		
Size	Medium	Medium
External economic factors	Medium	Low
Financial cost of damage	High	High
Owner	Medium	Medium
Organizational characteristics	Medium	Medium
Resource availability and benefits associated	High	Med
Local government		
Institutional setup	Low	High
Leadership style	Admin	No role
Leadership quality	Low	No
Overall LG capacity	Low	Low
Relationship btw LGs and polluting firm	Low	Low
Community basic factors		
Resource system characteristics	High	Med
Leadership	High	High
Social capital	Medium	High
Self-organizing capacity	High	High
Dependency on firms	High	High

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