



Determinants of Public Opposition to Siting Waste Facilities in Korean Rural Communities*

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This study attempts to characterize and empirically explore the natures of public opposition to siting hazardous facilities in the context of social and political implications of siting policies of government and social and cultural costs imbedded in consequential community restructuring of siting. Binary logistic regression analyses are applied to the survey data from residents of Korean rural communities. As a result, unilateral government siting decision and public concern about community disintegration are identified as important sources of public opposition to siting waste facilities. While economic restitutions decrease public opposition, economic compensation alone is not enough to have public supports. Effects of perceived risk, public distrust in government, and economic compensation are contingent upon whether public oppositions are against hypothetical siting or actual siting.

Keywords: public opposition, unilateral decision, community disintegration, lack of trust in government, perceived risk, economic benefit, siting waste facilities

In recent decades, increasing pressure on land use in Korea with rapid economic growth and urbanization has accompanied the incorporation of rural areas into urban cities. Locally unwanted facilities such as various waste dumping sites and hazardous waste incinerators are an important source of such pressure. However, the government's plans for siting such facilities have been frequently confronted with public oppositions from many rural areas in Korea. These public protests to siting locally unwanted facilities have been generally treated as selfish "Not In My Back Yard" (NIMBY) activities against rational government decisions and common good and regarded as reflection of people's irrational economic greed. However, it has been revealed that those protests are neither necessarily selfish NIMBY phenomena nor

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simply greedy activities for more economic benefits and compensations in empirical studies in the U.S., Canada (Freudenburg and Pastor 1992; Portney 1991; Rabe 1994) and Korea (Heo and Song 1999). In addition, rather than blaming “victims,” issues of public trust in government or agencies (Flynn, Burns, Mertz, and Slovic 1992; Kasperson, Golding, and Tuler 1992; Lobao and Meyer 2001; Slovic 1993; Slovic, Layman, and Flynn 1991), perceived risk to health and environment (Bourke, Bord, and O’Connor 1992; Kostov and Lingard 2003; Krannich and Albrecht 1995; Portney 1991; Slovic et al. 1991), and economic issues (Bourke 1994; Wulforth 2000; Xu and Tan 2001) have been identified as important sources of such public protests.

Although these previous studies have recognized importance of such issues to public protest against siting, they are simple and sociologically incomplete in the fact that issues imbedded in social structural changes in the very affected community have been relatively uninvestigated or overlooked (i.e., issues of community disintegration). Furthermore, public protest against siting waste facilities is even “reasonable and understandable,” if the way of selecting site is not based on residents’ deliberation and participation in affected communities from the earlier stages of siting process (Rabe 1994: 167). Thus, issues related to decision-making process (Portney 1991; Rabe 1994; Rabe, Gunderson, and Harbage 1994) should not be overlooked either.

In characterizing such public protests in sociologically meaningful and complete way, it is necessary to thoroughly and synthetically investigate issues of community disintegration imbedded in social changes and nature of decision making process together with those issues identified in the previous studies mentioned above. A primary concern of this study is to explore the nature of public protests against siting waste facilities in Korean rural communities in order to provide evidence of diverse sources of such protests in general.

PUBLIC PROTEST AGAINST SITING LOCALLY UNWANTED FACILITIES

The nature of public protest against siting locally unwanted facilities is specified in relation to patterns of decision-making process, community disintegration, public trust in government, perceived risks, and economic compensations or benefits, and then followed by situations of Korean rural communities.

Unilateral Decision-Making Process

Public protests against siting waste facilities may be regarded as collective responses against so-called “Locally Unwanted Land Uses” (LULUs), unilaterally decided, announced and implemented by governments. For local people, LULU means an unwanted way of restructuring community and thus, recent protests against siting waste facilities may also be

regarded as a collective reaction of residents to the very tactics of such siting policies of government (Portney 1991; Rabe 1994; Rabe, Gunderson, and Harbage 1994).

However, in many countries government interventions or policies were generally unilaterally decided, announced, and implemented by government alone for decades in the past and are still maintained in this way. This always serves to generate conflict, anger and distrust in government (Kasperson et al. 1992; Meyer and Lobao 2003). As Putnam (1993) suggests, those unilaterally decided government interventions or policies, usually disregarding or negligently devastating existing social capitals, not only make local public concerned highly about the disruption of existing social bases of their ordinary community lives, but also decrease perceived capabilities for local control over local land use with strong sentiments of deprivations and ultimately incite residents of community to oppose those very policies. Nonetheless, government officials elected or not have unavoidable desires to prove their competences to efficiently control and manage everything including siting waste facilities in their jurisdictions. Hence, for them various tactics of regulatory approaches are attractive and have continued to be employed (Rabe 1994: 45). Governments or bureaucratic officials especially in many developing countries always assumed that either strong regulatory tactics or governmental economic restitution would suppress any public disturbance once decisions were made. In fact, government officials mobilized bureaucratic system and used diverse criteria not necessarily limited to technical one to locate favorable sites and then employ a variety of coercive administrative mechanisms or, in some instances, economic and other restitutions. Even in the United States and Canada, predominant patterns of policy approaches to siting waste facilities have usually been such top-down, regulatory or market approaches without any disclosure of relevant information, explanation of the necessity and risks of the siting, and full participation of residents in affected communities from the earlier stages of siting process (Portney 1991; Rabe 1994). In addition, siting decisions in these strategies have been usually made by the anticipated absence of political oppositions, least political resistance or lack of social or political power (Bullard 1996; Portney 1992; Rabe 1994; Ringquist 2006). Consequently, waste facilities and burdens of the associated health and environmental risks have tended to be unevenly concentrated in those communities with large racial and ethnic minority populations, residents with lower incomes and educational backgrounds, or aboriginal lands (Bryant and Mohai 1992; Bullard 1996; Davis and Bali 2008; Fan 2006; Noonan 2008; Rabe 1994; Ringquist 2006; Sicotte 2008). Such injustice and equity problems may be explained in many ways, but are basically political matters implicated in prevailing siting policies (Ringquist 2006). In this sense, public protests are no more than protests against those very siting policies unilaterally decided and implemented by governments with top-down regulatory siting tactics.

Community Disintegration

Rural areas newly incorporated into cities encounter with two possibilities: One is an alternative living space with the amenities of rural-suburban life for urbanites (Salamon 2003). The other is a site of locally unwanted facilities such as various waste dumping sites and hazardous waste incinerators. In both cases, rural communities experience social structural changes in their traditional community. In other words, changes in “basic tenets taken for granted about communities with agrarian roots: shared values, density of connections, effective norms, and engagement and mobilization for the common good” (Salamon 2003: 12). This implies breakdown of what Putnam (1993) called social capital. Social capital here “refers to features of social organization, such as networks, norms, and trust that facilitate coordination and cooperation for mutual benefits” in the community (Putnam 1993: 35-6). However, these social capitals simultaneously have effects on and are influenced by social, political, economic structures (Putnam 1993), and even natural environment (Bell 1998). Accordingly, destruction of existing social capitals embodied in norms, networks, trust, and solidarity of the community means breakdown of over all structures of the community itself, i.e., community disintegration. As such resistances to so-called LULUs (Locally Unwanted Land Uses) have been generally found in various forms such as environmental, independence, cultural, or political democratic movements that address the survival of indigenous populations and community where they have lived from their ancestors until present generations (Taylor 1995). In this sense, recent protests against siting waste facilities may also be regarded as movements for community integration to preserve ordinary ways of rural life against outside forces, especially governments.

However, already existing social capitals such as strong networks and ties among residents especially in the rural areas easily mobilize to oppose siting locally unwanted facilities, because “high levels of social capital provide resources for the organization of opposition movement and large scale collective action” (Paxton 2002: 257). Furthermore, as social capitals such as norms and networks tend to be self-reinforcing and cumulative (Putnam 1993: 37), such social capitals as ties and engagement among residents become stronger than ever in course of protests (Couch and Kroll-Smith 1994). And these reinforced stocks of social capital continue to mobilize to protest against any attempts to destroy the very existing social capitals, and eventually against disintegration of their community. In this sense, opposition to siting waste facilities may be regarded as protest against destruction of community integration embedded in existing norms, networks, trust, and solidarity of the community.

Distrust in Government and Perceived Risks

It is common that governments have generally suffered from declining rates of confidence in public and private institutions (Lobao and Meyer 2001; Portney 1991; Rabe 1994). Even more

specifically when coercive or one-sided government policies or interventions have repeatedly ignored or undermined existing social capitals, political and social trust in general may become lower and lower given that socio-political structures and social capitals in general have mutual influences on each other (Putnam 1993). Nonetheless, for government officials elected or not, various tactics of top-down regulatory approach were attractive to exercise their discretionary power to control siting process. However, without full disclosure of relevant information about risks and related effects, already widespread distrust in government became even more aggravated; residents hardly trusted in governments and eventually opposed siting waste facilities (Portney 1991; Rabe 1994) because acceptance of any risk related to health and environment is more dependent on public confidence in risk management than on the quantitative estimates of risk (Slovic et al. 1991: 28-9). As such public trust in siting process of waste facilities represents the confidence people have in the ability and willingness of governmental officials to control and minimize various risks and maintain fair distributions of effects including burdens and risks of waste facilities (Flynn et al. 1992; Kasperson et al. 1992; Rabe 1994; Slovic 1993). In other words, public protest against siting can be seen as “a crisis in confidence, a profound breakdown of public trust in the scientific, governmental, and industrial managers” (Slovic et al. 1991: 29), because risk perceptions are “solely a derivative of the structure of human relations and thus managed exclusively on a social terrain” (Couch and Kroll-Smith 1994: 35). As a consequence, lack of public trust in government leads to increasing public perceived risk of health and environment in the community which, in turn, incites public opposition. In fact, public protest against siting emerges when the public believes that the siting is “a threat to their property values and a possible health hazard” (Couch and Kroll-Smith 1994: 31). And it was evidenced that perceptions of health risks expected had utmost independent influences on public decisions to either accept or oppose proposed siting plans (Portney 1991).

Economic Compensations vs. Social Costs

Although burdens of risks may be disproportionately concentrated in host communities, it is known that these facilities have both opportunity and threat impacts on host communities (Bourke 1994; Gramling and Freudenburg 1992; Krannich and Albrecht 1995; Wulfhorst 2000; Xu and Tan 2002). The opportunities are mostly economic and include economic development, increased employment, tax revenues, extraordinary cash payments, compensation, and other benefits such as new police and fire equipments, repaving streets and so on. However, sometimes people in a potential host community became infuriated at extraordinary offers, feeling that it was simply trying to bribe people into withdrawing their opposition (Portney 1992: 154). Yet, some communities may be interested in hosting such facilities for improvement in economic conditions of their communities. However, siting unwanted facilities did not necessarily endorse community development and one study found that locally

unwanted siting prison in the community did not contribute to community development at all (Hooks et al. 2004) and this even further aggravated spatial inequality in society (Lobao, Hooks, and Tickamyer 2007).

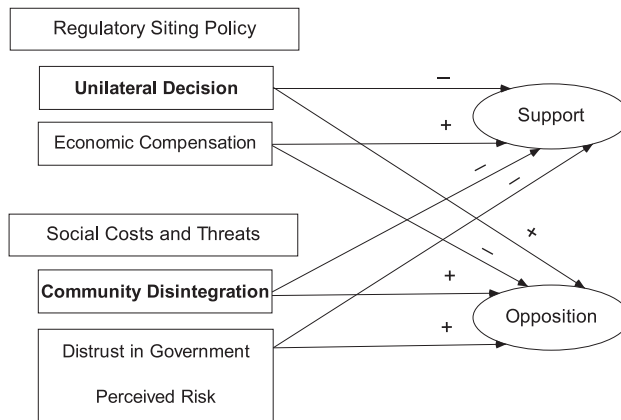
Threats or costs are diverse: There are economic costs such as lowering land prices (Couch and Kroll-Smith 1994), health threats such as perceived risk of health and environment (Bourke et al. 1992; Kostov and Lingard 2003; Portney 1991), and actual mental and physical health problems (Bevc, Marshall, and Picou 2007; Sicotte 2008). Also there are social-cultural costs such as disruption of existing social capitals (Heo and Chung 2003) that lead to destruction of ordinary community life and negative community images such as stigma or undesirable community reputation (Albrecht, Amey, and Amir 1996; Slovic, Flynn, and Gregory 1994; Wulfhorst 2000).

However, policy makers or government officials preferring top-down regulatory siting approaches have argued, if expected economic benefits sufficiently outweigh costs resulting from these facilities and reasonable economic compensations ensue, people would not oppose to siting such facilities. Nevertheless, all the costs, risks, or threats related to siting facilities such as perceived risks to health and especially destruction of such existing social capitals as networks, norms, and trust, eventually leading to community disintegration cannot be completely measured and compensated by economic capitals alone. Although economic compensations outweighing costs may foster reduction of public opposition to siting, economic compensation alone is not enough to have public support (Portney 1991; Rabe 1994). Thus, if any study tries to explain or view public protest against siting as simple and uni-dimensional, or irrational it may become superficial and these protests or social conflicts cannot be adequately understood or resolved.

The Model of Study

This study attempts to specify diverse sources of public opposition to siting locally unwanted facilities. Theoretical explanations and illustrations above may be summed up in a diagram specifying unilateral decision, community disintegration, distrust in government, perceived risk, and economic compensation as determinants of public attitudes (support/opposition) to siting locally unwanted facilities. This could not only represent whole theoretical arguments in this study but also serve as a testable model for empirical analyses. Figure 1 presents the model which satisfies both.

Furthermore, a country-specific exploratory research on public opposition in Korea may extend our understanding of the nature of public protests and also show an additional evidence of diverse sources of such public protests. General illustrations of Korean rural communities are followed by the background of public opposition in rural communities of Kyungsan city, Korea.

Figure 1. The Model of Determinants of Public Attitudes

Korean Rural Communities

Residents in rural areas newly incorporated into cities in Korea often have increased expectations about the economic and social benefits that come directly from rising property values and indirectly from being a place for an alternative way of living with amenities. But when waste facilities were sited in their communities, land prices fell and their communities were not regarded as alternative living places any more. In these areas, residents frequently confronted increasing potential risks from such facilities and a deterioration of traditional rural social capital such as indigenous mores, social relations, and social organizations (Heo and Chung 2003). In addition, they were also in difficulties for selling their agricultural products that would be regarded as polluted. The most important common complaint would be from the fact that siting unwanted facilities at their communities were unilaterally decided and implemented by government alone (Heo and Song 1999; Kim and Kim 2003; Lee, Park, and Park 2002; Park 2000; Yu 2000). Nonetheless, for local government officials who are eager to demonstrate their abilities, various tactics of unilateral regulatory approach once dominated under authoritarian regimes had still unavoidable attraction and continued to be employed. The case of Kyungsan city serves as an example.

The Case of Kyungsan City

Kyungsan city is located in a southern part of Kyung-Buk province. The population is 220,000, and population density is 525 persons per squared kilometers. Rural population in this city is about 26,000. The city has local industrial complexes and more than ten universities and colleges in various sizes as well. The city needed another site of waste facilities because existing facilities were no longer capable.

After no communities voluntarily applied even if tremendous economic compensations

were openly announced to provide, Kyungsan city government alone unilaterally selected and announced four areas, Namsan, Jain, Yeocheon, and Yongsung, as potential sites of waste facilities. City government organized the siting selection committee whose members were appointed by mayor and mayor became the chair of the committee. This committee had a whole power of decision to select the site of waste facilities from predetermined four potential candidates but the process was not open to the public. Among four candidates, Jain and Yeocheon are closer to down-town of the city and have relatively dense populations. Yongsung, mayor's home community and Namsan are peripheral rural areas with large portions of forests. Most of people in these areas are fruit-growing farmers, have lived there from their ancestors with family grave yard for hundreds years, and there is a strong solidarity among villagers. The siting selection committee finally decided and city government announced Namsan as the site of waste facilities for the city. And it was known that the committee's decision was made based on environmental and social impact assessments of the four areas reported by a public corporation. Residents of Namsan neither accepted the decision nor trusted in the report of environmental and social impact assessments by the corporation. Because the mayor as the final top decision-maker and chair of the siting committee came from Yongsung, residents of Namsan thought that the role of the committee and the report were merely technical tools to rationalize unilaterally predetermined siting decision. They thought that final decision was unfair and it was affected by political favoritism here. People of Namsan asked a nationally known environmental NGO (Green Coalition) to reassess environmental and social impacts for the four candidate areas. The results were diametrically opposed to those of the corporation. Yongsung, the mayor's home community, got the highest score as the site for waste facilities, not Namsan. Then, residents of Namsan asked city government for reassessment by third party, neutral and objective experts such as university faculties, and declared that they would accept whatever result would come. But the mayor and committee rejected the request from Namsan residents even though the municipal assembly recommended that the mayor accept the residents' request. After that, people living in Namsan started to protest physically and legally against the decision of city government (Kim 2004). This provides another example that the selection of the siting place is unilaterally decided by government as in the United States and Canada. And it may be based not on scientific and technological accuracy but on political favoritism.

AN EMPIRICAL ANALYSIS OF RURAL COMMUNITIES OF KYUNGSAN CITY IN KOREA

The primary concern in this study is to empirically explore the nature of public attitudes (support/opposition) to siting waste facilities and related issues in these rural communities of Kyungsan city in order to provide evidence of public protests against locally unwanted

facilities in general. The model in Figure 1 is applied to empirically analyze public attitudes of four rural communities in Kyungsan city mentioned above. Also it assumes that public attitude to siting waste facilities at residents' own communities (hypothetical site) may be different from that at Namsan (actual site). Therefore, two analytical models based on the model in Figure 1 are investigated to understand their different dynamics of attitudes to siting waste facilities and related issues.

Data and Methods

Data were obtained from the Public Attitudes toward Environment and Risk Survey supported by the Survey Research Institute of Daegu University, Korea. Interviews were conducted between June 15 and 25, 2002 with a sample of 365 adults living in four rural communities of Kyungsan city mentioned above. For sampling, households were selected proportionately to the number of households in each community. Any individual over age 18 whom interviewers met first in each household was interviewed. When two or more persons over age 18 were met simultaneously in a household, the older person was interviewed. Included in the analysis are 312 respondents: 147 males and 165 females. There were 80 respondents from Namsan, 78 from Yongsung, 43 from Yecheon, and 111 from Jain.

Attitudes of public opposition or protest to siting waste facilities at respondent's own community (hypothetical site) and at Namsan (actual site) consisted of two separate dependent variables. Each was measured by indicators of the same three different ways of opposition or protest. As seen in Table 1, <vote 1>, <opp 1> and <deal 1> are measures for attitudes of opposition or protest to siting at respondent's own community while <vote 2>, <opp 2>, and <deal 2> are used to measure them at Namsan (see Table 1 for indicators and range of responses). Because distributions of indicators were so skewed even after indicators were combined, dependent variables were dichotomized into only attitudes of opposition and other responses (see footnote in Table 1). As independent variables, attitudes for <economic benefits>, <perceived risk>, <lack of trust>, <unilateral decision> and <community disintegration> had two indicators respectively (see Table 2). The scale coefficient of reliability (Cronbach α) of <unilateral decision> was 0.881; <economic benefits>, 0.926; <community disintegration>, 0.671; <lack of trust>, 0.827; and <perceived risk>, 0.842.

With dependent variables dichotomized it is appropriate to apply binary logistic regression analysis for identifications of meaningful variables for attitudes of public protests against siting waste facilities. This model was applied to public oppositions to both siting at respondents' own communities (hypothetical site) and siting at Namsan (actual site) to examine whether or not there is any difference between them. The analyses of these models follow general description of public attitudes to siting.

Table 1. Dependent Variables of Public Opposition (to siting waste facilities) and Empirical Indicators.

Dependent Variables*	The Highest Score	Mixed Responses		The Lowest Score	N
	Opposition (3)	(2)	(1)	(0)	
(A) Opposition to siting at respondents' own community	266 (85.3)	17 (5.4)	13 (4.2)	16 (5.1)	312
(B) Opposition to siting at Namsan	178 (57.1)	13 (4.2)	36 (11.5)	85 (27.2)	312

Indicators of Dependent Variable (A)

<vote 1>	Suppose that city government selected your community area as a site for the waste facilities of the city, but it would not be located there unless residents of your community voted in favor of it. If this were the case, would you vote for it, or against it?		
N	For (0)	Against (1)	
312	(5.8)	(94.2)	
<opp 1>	Suppose that city government decided and announced your community area as a site for waste facilities of the city, what would you do? Would you accept the decision or oppose the decision through protest or demonstration?		
N	Accept (0)	Oppose (1)	
312	(9.9)	(90.1)	
<deal 1>	If city government decides and announces your community area as a site for waste facilities of the city and offers a lot of benefits for your community instead, what would you do? Would you try to make a deal with city government instead of opposition in order to get more benefits for you and your community or would you mobilize every possible way to oppose the waste facilities even if the benefits that the city government offered would be turned down?		
N	Make a deal (0)	Oppose and no benefits (1)	
312	(13.5)	(86.5)	

Indicators of Dependent variable (B)

<vote 2>	If city government at that time offered a vote for or against Namsan as the site of waste facilities for the city, would you vote for it or against it?		
N	For (0)	Against (1)	
312	(39.4)	(60.6)	
<opp 2>	Would you accept the decision of the city government that Namsan is the site of waste facilities or oppose it?		
N	Accept (0)	Oppose (1)	
312	(38.5)	(61.5)	
<deal 2>	Do you think residents of Namsan should stop their opposition and make a deal to get more benefits or do you believe residents of Namsan should continue to do all they can do to oppose the siting of waste facilities even if the benefits that the city government offered would be turned down?		
N	Make a deal (0)	Oppose and no benefits (1)	
312	(31.1)	(68.9)	

Note 1 * Each dependent variable is made first, by taken sum of 3 indicators respectively. The ranges of each sum are 0, 1, 2, 3, and 3 means responses of 'opposition' to all three indicators while 0 means 'accept' to all, and 1 and 2 represent mixed responses, which have responses of both 'opposition' and 'accept.' Then each dependent variable is dichotomized; 1 represents 'opposition' to all (3), and rest of them (0, 1, and 2) become 0, which means either responses of 'accept' to all or mixed responses.

Public Attitudes to Siting

Public attitudes were mostly negative toward siting and related issues concerned here. As seen in Table 1, 85.3% of respondents from the four communities would oppose siting waste facilities in their own communities while only 5.1% supported it. Regarding the Namsan, actual site for waste facilities that was decided and announced by the city government, 57.1% of respondents opposed it while 27.2% supported it. Close to 60 percents of respondents from all four communities opposed siting at Namsan (actual site), although the percentage of

Table 2. Independent Variables and Empirical Indicators (N = 312)

Independent Variables and Empirical Indicators	Strongly Disagree (%)	Disagree (%)	Neutral (%)	Agree (%)	Strongly Agree (%)
Economic Benefits					
1. General economy of this community will be improved greatly from waste facilities.	(45.2)	(38.8)	(8.7)	(6.4)	(1.0)
2. Individuals of this community will have a lot of economic benefits from waste facilities.	(49.0)	(34.0)	(9.9)	(6.4)	(0.6)
Perceived Risk					
1. People will suffer heavily from so many expected or unexpected accidents from waste facilities.	(1.0)	(2.6)	(2.2)	(40.1)	(54.2)
2. People in this community will suffer seriously from diseases from unknown causes after the facilities start to work.	(0.6)	(2.9)	(3.5)	(39.1)	(53.8)
Lack of Trust in City Government					
1. * The report and announcement about siting selection processes by the corporation and city government would be reliable.	(31.4)	(26.6)	(28.8)	(10.3)	(2.9)
2. * City government will thoroughly and effectively manage and control the operations of the facilities when they work.	(25.0)	(34.9)	(26.3)	(12.2)	(1.6)
Unilateral Decision by City Government					
1. * The way decision is made and procedures of siting waste facilities would be legitimate and democratic.	(26.9)	(31.1)	(20.2)	(17.6)	(4.2)
2. * Residents would be allowed to participate in decision-making processes of siting waste facilities.	(28.2)	(33.7)	(19.2)	(14.1)	(4.8)
Concern about Community Disintegration					
1. I would have strong feelings of deprivation and desperation because community could be no longer my home town as it is now anymore if waste facilities are sited here.	(1.9)	(9.3)	(16.0)	(35.6)	(37.2)
2. I will move out if waste facilities are sited here and start to work.	(4.5)	(17.3)	(18.9)	(28.8)	(30.4)

Note | * These items were recoded in the analysis.

opposition to siting at their own communities (hypothetical site) was larger than that.

One may point out that this result is an indication of NIMBY phenomena. But results in Table 1 showed different pictures, too, considering the degree of oppositions or protests. In the case of siting at their own communities, a rate of public opposition at any cost against siting (deal 1) was 87% and lower than those of other ways of oppositions by voting or certain actions (vote 1 and opp 1) with over 90% of opposition rates, respectively. To the contrary, in the case of siting at Namsan (actual site), the result showed that a rate of public opposition at any cost (deal 2) was higher than those of other ways of opposition (vote 2 and opp 2). Rather than simply saying public oppositions against siting as NIMBY phenomena, these may imply that it is more reasonable to further investigate the nature and sources of public opposition. This is all about what this study tries to examine.

In Table 2, more than half of respondents expected that the way of decision making by city government would be undemocratic and might not be legitimate, while only about one fifth expected that citizens would be allowed to participate. Over 80% of respondents did not expect economic progress for individuals as well as the community, while only less than one tenth of respondent expected that. And over 70% of them agreed that they would have feelings of deprivation and desperation. Even nearly 60% of them answered that they would move out. Over 90% of respondents agreed that people would suffer from unexpected risks, while about 60% of them did not trust in government. These may provide an additional implication that such public oppositions to siting are not simple but complicated phenomena with many possible reasons. In following, we further investigate complicated nature of public protests or oppositions to siting waste facilities.

Analyses of Binary Logistic Regression Models

Results of binary logistic regression analyses were presented in Table 3. As mentioned above, two models were analyzed: one was for public attitudes to siting at respondent's own community (hypothetical site) and the other for those at Namsan, actual site. It was appeared that models in Table 3 generally fitted the data well and were statistically significant.

Siting at Respondents' Own Communities

In the case of siting at respondents' own communities (hypothetical site), as expected the more government decided unilaterally, the more there was public opposition; the more economic compensation or benefits the public expected the less the public opposition to waste facilities. Where there was more concern about community disintegration, there was more public opposition; the higher the perceived risk, the more the public opposition to waste facilities. But unexpectedly, lack of trust in government did not have any effect on public opposition. However, this is a similar result to the previous studies in United States that lack of trust did not have a direct effect on public oppositions (Flynn et al. 1992); another study indicated that

Table 3. Binary Logistic Regression of Public Opposition to Siting at Respondent's Own Community and at Namsan.

(Opposition = 1, Accept or mixed responses = 0)

Variables	Respondent's Own Community		Namsan	
	B (S.E.)	Exp (B)	B (S.E.)	Exp (B)
Constant	-6.879** (2.202)	.001	-6.221** (1.459)	.002
Economic Benefits	-.605** (.245)	.546	.222 (.189)	1.249
Perceived Risk	1.334** (.346)	3.796	.345 (.229)	1.412
Lack of Trust in City Government	-.027 (.286)	.974	.506** (.165)	1.659
Unilateral Decision by City Government	.600* (.237)	1.822	.370** (.138)	1.447
Concern about Community Disintegration	.721** (.279)	2.057	.373* (.164)	1.452
Overall Predicted Percentage		91.0	65.1	
N		312	312	
-2 Log Likelihood		157.442	364.420	
Model Chi Square		103.537**	61.878**	
df		5	5	
Hosmer and Lemeshow Test:				
Chi Square		12.397	11.194	
df		8	8	
p		.134	.191	

Note | *: $p < .05$, **: $p < .01$

although trust in governments might play a role in public opposition, their relationship depended upon trust in specific levels of government, federal or state (Portney 1991: 61). This study in Korea may be another example.

Unilateral decisions by government increased public opposition, while economic benefits induced the public to support siting waste facilities. Their effects offset each other. This result may justify conventional regulatory government policy. Although government unilaterally decides the site, however if it simultaneously provides sufficient compensations and additional benefits, public would not oppose siting at their own communities. And this may also stimulate irresistible temptation of government officials to unilaterally implement siting plans. But these strategies are too simple and uni-dimensional and have frequently failed in the United States as mentioned above. There may be more sources of public protests that could not be economically unraveled. This study provides evidence for reasons why this is so in Korea. In this study

concerns about community disintegration had a significant effect on public opposition. Where there were more concerns about community disintegration, there were more public oppositions. In addition, perceived risk had a significant effect on public opposition, too. This means that although economic incentives cannot be ignored, they cannot solve all the problems without any considerations of social implications of siting policies of waste facilities. Thus, it is said that public protest to siting is a collective action against undemocratic decision-making, social costs (community disintegration) and health threats to the community, and may not be a direct reaction to distrust in governments. Further, economic incentives and compensations may be necessary, but mere economic benefits alone may not be sufficient to get public support.

Siting at Namsan

The case of public opposition to siting at Namsan (actual site), where decision was unilaterally made by city government and public already knew what happened, showed different configurations from that of siting at respondents' own communities (hypothetical site). Expectedly, these imply that public responds differently depending on whether the site is at their own communities or not. As seen in Table 3, in the case of siting at Namsan unilateral decisions and concerns about community disintegration maintained their significant effects on public opposition likely to the case of siting at their own communities, but unlikely, effects of economic compensations disappeared at all. Next, lack of trust in government had a significant effect on public opposition while it had no effect at all in the case of siting at respondents' own communities. Thus, in the case of siting at Namsan, actual siting place, it was revealed that unilateral decision, public concern about community disintegration, and public distrust in city government induced public opposition while economic compensation or benefits and perceived risks did not have any influence on public attitudes to siting at all. Unlikely to the case of siting at respondents' own communities, what mattered at Namsan were neither possible economic benefits and compensations nor expected health or environmental risks in the near future. Rather what mattered were unilateral government decision itself which accordingly aggravated existing distrust in city government and concerns about consequent restructuring of social structure of community. Thus, what made public protest at Namsan was political and social issues. This may be evidence that such opposition should not be simply regarded as a reflection of NIMBY attitudes.

CONCLUSIONS AND IMPLICATIONS

It is well known that the unilateral siting decision as a measure of conventional regulatory siting policy is undemocratic and always serves to generate conflict, anger and distrust in government (Kasperson et al. 1992; Protney 1991; Rabe 1994; Meyer and Lobao 2003) in the

United States and others; the results of this study reconfirm that it could be also true of Korean situations. However, the results of this study suggest that public attitudes of opposition to siting waste facilities cannot be simply reduced to individual selfishness or greedy economic interests (Terluin 2003) such as NIMBY phenomena. In fact, they originated from diverse sources in various ways: Issues related to social structural changes in the community such as public concerns about community disintegration which were largely overlooked in the United States were appeared to be crucial to explain attitudes of public opposition to siting locally unwanted facilities in Korea.

Moreover, one of previous studies found that neither lack of trust in government nor economic benefits had any effect on public opposition at all (Flynn et al. 1992). Nonetheless, effect of distrust in government was significant at actual siting although it was not significant at hypothetical siting case in this study. The effect of economic benefits was significant at hypothetical siting case but disappeared at actual siting case. Particularly, it was known that perceptions of health risks had utmost independent influences on public decisions to either accept or oppose proposed siting plans (Portney 1991). However, this study showed that it was true only at the hypothetical case. These may come from the fact that both studies in the United States (Portney 1991; Flynn et al. 1992) did not specify or distinguish actual siting from hypothetical siting cases at all while present study clearly did.

This study clarifies several aspects that could not be discerned in previous studies. First, this study demonstrates the fact that community disintegration is an important and immediate resource for public opposition to siting waste facilities which did not clearly appear in studies in the U.S. Thus, social aspects of public opposition should not be overlooked in this area of studies. One further implication of this study is about social capital. Public oppositions are in diverse ways interwoven with community disintegration, decision-making system, public trust in government, and perception of risk. All of them are imbedded in social capitals of both communal and societal levels. As applying the concept of social capital even if not explicit enough, this study may suggest another possible way of studying public protest against siting. Finally, this study suggests that distinction between public opposition to hypothetical siting and actual siting is important to understand genuine sources of public opposition. This study analyzing both hypothetical and actual siting cases showed the fact that effects of economic benefits, perceived risks, and public distrust in government were contingent upon whether public opposition concerned was against hypothetical or actual siting. By the same token, it is possible that variables in this study may operate in different ways in studies conducted elsewhere.

From the practical point of view, the results of this study may be useful to policy-making. Economic incentives and compensations may be necessary, but mere economic benefits alone may not be sufficient to get public support. Rather, from the initial stage of siting process, the government should fully disclose relevant information about siting, try to have an opportunity

to discuss or compromise various problems such as issues of safety and risks of siting with residents, show an ability to control any risks related to facilities, and get residents' confidence. Also ordinary as well as specific activities of governments should always be transparent and fair. In this way, transparent, fair, and democratic decision-making process and higher public trust in government may be able to cut down unnecessary economic expenses and social costs and to reduce probable conflicts (Rabe, Gunderson, and Harbage 1994). In addition, as seen in this study, one major source of public opposition is public concerns about community disintegration embedded in existing social capitals. Thus, governments should consider existing social capitals from the initial stages of their plans. Finally, protest against siting waste facilities is an expression of people's increasing aspirations for exercising their rights and eagerly being engaged in concerned social issues (Portney 1991; Rabe 1994). In this sense, open public opposition or protest itself is a positive symptom of democracy in action. It may be a grass-root democratic movement. All imply the fact that government's siting policies with open democratic decision-making process and consideration of existing social capitals may provide an opportunity to move toward more open, transparent, and effective government policies and toward full realization of democratic ideals in the nation.

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