(Draft)

NIMBY Dynamics:
Location Policy of Crematory Facilities in Korea

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Abstract

The purpose of this study is to find what factors are directly related to the location of a NIMBY (Not in my backyard) facilities. Using causal loops and stock-flow models derived from System Dynamics (SD) approaches, it focuses on Cheongju crematory location project in Korea. After a series of simulation works, the research finds that the unilateral tactics handled by the public unit have aggravated the public project delay as the negative externalities originated from the adjacent location of NIMBY facilities have exerted significant influence on the dynamic perceptions of major stake-holders. We observe that the proposed alternative negotiation-based models produce higher level of planning performance than the existing approaches in relatively a shorter period. Even though the former may require more human and material resources from the very beginning stage, as they have to deal with diverse grievances raised by neighboring residents, most of them would be geared toward strengthening reinforcing loops within the complex conflict structure. These results imply that the proposed negotiation approach to deal with public location projects would enhance mutual agreement among major stake-holders, upgrading the overall quality of public project management.

Keywords: NIMBY (Not in my backyard), Crematory Facilities, Project Delay

I. Introduction

Most of public service facilities can be easily dichotomized into either NIMBY (Not in my back yard) or PIMFY (Please in my front yard). Whereas PIMFY facilities have to deal with how to dampen overheated competition among host regions, NIMBY ones are usually confronted with ever-escalating confrontation between local residents and supplier(s) including the public units. As basic interests of major stakeholder are complicatedly intermingled in locating NIMBY facilities, it seems difficult to define who should bear the primary responsibility if both useless project delay and cost overrun are realized. Without exception, most local residents are destined to protest against the expected negative externalities originated from these NIMBY facilities. In contrast, the public units which stress the rationality of legal and administrative

procedures are not free from the temptation to unilaterally locate NIMBY facilities, if their plans are under heavy attack. Literally, if confrontation happens, it seems inevitable not to pay due attention to pre-negotiation between pros and cons, dismissing the overall agreement. Following the widespread rumor and official announcement, the public projects aimed at the location of the NIMBY facilities have been drawn into a whirlpool of conflict expansion without difficulty, repeatedly provoking residents' opposition or insubordination towards the public sector's popular DAD(Decide-Announce-Defend) techniques.

If the public project has to experience futile ups and downs, its negative impact could be even transferred to the private sector, not confining to the public sector per se. Sometimes local residents have to endure unexpected decrease in their property or security values which would reflect land use or construction control. The public sector has to make up the delay loss aggravated by the negative externalities and unexpected side-effect. In the long run, it seems unavoidable for most citizens to bear the additional burden caused by the abnormal delay. Nonetheless, under the current legal and institutional provisions, it is not easy to clarify where the responsibility lies. It would be safe that the delay margin of the public project would be wider than that of the private project. Furthermore, it is more difficult to figure out the appropriate compensation methods for explicit or implicit losses rooted in the public project delay.

After the implementation and location plans are fixed, there still remain delay questions in terms of facility management and operation. Up to now, however, the public project depends not on pre-, but on post-evaluation of trial and error procedures, mainly due to absolute lack of relevant data. As the objective tools to analyze the project delay and cost overrun are not ready, the subjective judgment has still been ubiquitous.

This study focuses on what factors are directly related to the location of NIMBY facilities in Korea. Using causal loops and stock-flow models derived from System Dynamics (SD) approaches, it examines a series of policy alternatives to ameliorate the public project dilemma. In specific, it pays attention to major delay factors directly related with location of crematory facilities and investigates the dynamic loci of these variables upon causal loops and stock-flow models.[1]

[1] In Korea, local administrative units have actively pursued the location of NIMBY facilities like crematory and waste treatment facilities. Nonetheless, many of these facilities have been literally drifted away over several years. Even though both the central government's subsidy and the municipal budget are ready, these facilities have been under residents' opposition for more than decades or so.

II. Location of NIMBY Facilities and Public Project Delay

1. NIMBY Facilities and Location Characteristics

NIMBY (Not in my back yard) facilities is commonly defined as public facilities which would easily provoke negative responses from neighboring residents, even though most people accept its necessity in the broader social dimension. That is, NIMBY is a 'must' for the society as a whole. But it also accompanies negative externalities like environmental contamination and decrease in land value, which would exert negative impact on neighboring residents. That is the reason why NIMBY facilities are almost equal to the LULU (locally unwanted land use) ones.

Their unique location characteristics are directly interconnected with project dilemma in the public unit. Therefore, the location of NIMBY facilities has been confined to specific areas where would minimize social and environmental damage even if any accident happens. Owing to NIMBY's indivisibility character, there exists incongruence question between benefit and cost sharing. These characteristics are more obvious in the public facilities like incinerator or crematory facilities. Of course, it is so natural for the neighboring residents as rational agents to protect their interest. For them, due compensation is no more than basic conditions for their physical and non-physical losses. If they cannot satisfy with the local government's offer, they may easily resort to more violent means through the collective actions.

2. Public Project Dilemma

Public project typically passes by a series of procedures, starting from the location planning up to facility management and operation. In every stage, factor(s) concerned with the public project dilemma may be active or at least latent. Up to now, the main stream research on the public project dilemma is given to management methods and social cost. Ostrom (1990), Patten and Sawicki (1993), Moore (1995), Flybjery, et. al. (2002), Dolsak and Ostrom (2003), and Liu (2003) are the typical examples.

Furthermore, Bass (2000), Deister (2000), Thompson (2001) and Bazerman (2002) emphasize on the conflict management issues in the public arena.

In Korean context, various problems related to the public project dilemma go back to the customs of unilateral planning geared toward administrative-expediency tactics. For several decades, public projects in Korea have been usually handled by a handful of administrators and specialists, excluding or minimizing neighboring residents' due opinions. These types of practices have invited residents' disagreement, strengthening dilemma structure per se over time. Therefore, the very first step for the public project should start from how to reflect the reasonable request of the neighboring residents.

Then, why do most mega-projects controlled by the public units experience unacceptable delay and confusion? Park, et. al. (2005) point out the fact that they have been carried out without winning the local consensus and/or without presenting thorough feasibility test.[2] In the similar study, Lee and Lee (2004) also explain that the procrastination in the public projects is deeply rooted in social conflict raised by key stakeholders. They diagnose that disagreement and its following conflict are the prime factors for the public project dilemma in Korea. In this context, the location project of NIMBY facilities may entail the vicious cycle which could easily amplify the confrontation among stakeholders, especially between the public unit and residents.

Judging from the existing documents (Yu, Kwon and Oh, 1997; Kim, 2001), the degree of social conflict depends on a series of factors including citizen participation and networking, compensation, reliability, changes in property value, and latent risk. Without due compensation, in reality, it seems almost impossible to implement the location project of NIMBY facilities. The tug-of-war on how the compensation issues should be settled significantly influences the project implementation speed. However, it should be reminded that compensation is only useful for the relatively low-risk facilities (Frey et. al., 1996). That is, the influence of compensation factors would be minimized as the degree of project risk increases. In extreme case, if residents regard compensation as a kind of bribery, the opposite effect would rather be heightened. Or, if internal quarrel happens among residents over the distribution methods of the compensation, it also exerts negative impact on the scheduling.

[2] Similar to prisoner's dilemma, they insist, the project delay in the national unit seems aggravated over time in Korea. In extreme cases, the neighboring residents do not hesitate to oppose against any kind of government proposal. In contrast, the government dared to hurry up the project kick-off in defiance of unprecedented social cost.

III. Cheongju Crematory Case

1. Background Information

Cheongju City Government hoped to construct a municipal memorial park in its southeastern outskirt in the early 1990s.[3] To calm down severe objection from neighboring residents, Cheongju City Government dared to offer more than a dozen types of incentives.[4] After several ups and downs, the two sides finally came to an agreement. Far behind the original schedule, the memorial park was completed by mid-1990s.

In the early 2000s, again, the City Government tried to implement a crematory project. Based on the feasibility study, it hurriedly designated about 33,000 square meters within the memorial park as the future crematory site. But its plan was confronted with unprecedented objection from the aboriginal residents around the designated areas.

First of all, local residents who organized an opposition group did not hesitate to attack the City's proposal. Ahead of discussing any topics on the crematory project, they requested with highest pitch that the City Government should offer an official apology and compensate for the physical and non-physical damages originated from the location of the existing memorial park. They even pointed out the fact that key projects under mutual agreement between the City Government and residents have not been carried out in their areas. In their judgment, the Cheongju City Government made several empty promises in the first half of 1990s.

On the contrary, the City Government claimed that it has fulfilled most of its original promises. And it repeated that the remaining tasks would be handled in the nearest future. Based on the questionnaire survey in 2003, the City Government also insisted that the absolute majority of Cheongju citizens wanted crematory facilities in its jurisdiction. Furthermore, the Mayor proudly announced that it would regard the

[3] As of the end of 2006, Cheongju City has an area of 153.31km2 and population of 615,155.

[4] They include green belt cancellation, changes in zoning, construction of zoo and botanical garden, operation right on the memorial park. However, some incentives might be classified as ones outside Cheongju City Government authority.

crematory project as the most urgent matter. Judging from physical and socio-economical conditions, the City Government proclaimed that the proposed site would be the best choice available.

To break the deadlock situation, the Cheongju City Government even prepared a comprehensive regional development plan in 2004. Residents regarded, however, that Cheongju crematory project is not as urgent as the City Government claimed as citizens may use other crematoria if they have to. Both sides only partially agreed with the Cheongju City's suggestion to prepare a comprehensive regional development plan.

After numerous meetings, in addition to the various physical confrontations, the temporary mutual agreement between the City Government and resident's opposition group were finally made in the summer of 2005. Since then, the construction works were resumed. Now, it is expected that the Cheongju crematory project would be completed within the end of this year (2007). Considering its original schedule, it is almost half a decade behind!

2. Crematory Dynamics

Table 1 presents major crematory variables and their contents. The evaluation criteria are based on basic standards of negotiation, planning adjustment, and implementation, all of which are derived from the existing documents.

Numerous variables are directly or indirectly related to the public project dilemma. As this study primarily pays attention to built-in delay structure and behavioral patterns, it develops the following basic assumptions. Firstly, it presupposes that there is no budget limit in the local administrative unit and the compensated amount depends on the will of the local government. Secondly, it excludes subjective judgment on the organizational management method and key stakeholder's personal capability. Thirdly, it assumes no drastic change or unexpected accident which would exert significant impact on the status quo.

Table 1: Crematory Dilemma Variables and Their Contents

Categories	Subcategories	Contents
Negotiation	Participant size	Key participants include Cheongju City Government, City Council, local residents, research organization, and community-based organizations.
	Official's effort	Cheongju City Government has set up task force team solely devoted to the crematory project.
	Information networking	Even though Cheongju City Government which has prepared a comprehensive development plan has systematically collected data, its information sharing with local residents has been relatively low.
Planning adjustment	Legal and institutional arrangement	Cheongju City Council prepared municipal ordinances focused on crematory project.
	Cooperation between participants	The absolute number of local residents has offered strong opposition in order to cancel the location of Cheongju crematory within their neighboring areas.
	Negotiation abilities	Even though there have been numerous meetings between city officials and opposition group's leaders, there still exists lack of mutual understanding.
	Group leadership	Opposition group's core members have been the most active against the crematory project..
	Public reliability	Residents' reliability has been extremely low as they believe that Cheongju City Government made several empty promises for the location of memorial park, which had been carried out ahead of crematory project..
Implementation	Project Size	Site: 33,058m^2, Total Cost: 14.25 billion Won
	Administrative efficiency	Cheongju crematory project had to pass the required administrative procedures including environmental and traffic impact analyses.
	Project profitability	Site purchase has not been a big deal as 99% is City Government-owned. And the City Government wants to run Cheongju crematory as a non-profit organization.
	Project flexibility	If both sides agree, it would be possible for the City to flexibly accommodate minor plan changes.

1) Crematory Causal Loop Diagram

The R1 and R2 reinforcing loops in Figure 1 present the ideal situation. If major stakeholders agree to adopt the negotiation approach which would require more time and effort in the initial stage of the public project, they strengthen reinforcing feedback loops toward lowering conflict level over time. [5] The overall negotiation level would

5 In the causal diagram, issues on the planning coordination are not reflected. If the plan has to be frequently changed owing to adjustment variables, nonetheless, it would provide a fatal impact on the schedule and cost..

be upgraded through subtle combination of compensation counter-measures(R1) and/or increased public confidence(R2).

In terms of balancing loops, the highlighted B1 shows the most basic feedback structure geared towards minimizing project delay as the public grievance would be resolved in a series of intervention, negotiation, and planning adjustment movements. In the similar vein, if the public sector accepts residents' due participation demand, there exist higher chance for both sides to settle key issues down(B2).

In contrast, the R3 and R4 loops in Figure 1 represent the location dilemma of a typical crematory project, in which the public policy overly skewed toward the unilateral planning has dominated the whole processes. This kind of administration-first strategy leads to lowering local citizens' reliability. Combined with residents' feeling of being victimized, it is destined to increase the objection level, requiring additional efforts to resolve the disputed points. In fact, R3 and R4 symbolize the typical carrot and stick policy. Here, the former refers to the traditional aggressive measures and the latter means a series of incentive to mitigate the opposition level. Even though the government-initiated compensation usually produces positive impact on the residents' perception(as the case of B3), it also reminds that NIMBY facilities including crematory facilities would not be handled solely by the compensation options. On the contrary, the additional compensation measures would lower the negotiation power of the public unit as it would often incur an unexpected internal strife among residents. If the public unit actively seeks citizen's participation and offer reasonable compensation measures from the early stage, nonetheless, it would contribute to enhancing the negotiation level and minimizing the required negotiation time.[6]

These results imply that the negotiation-based model would enhance the public reliability level within relatively a shorter time, which would exert positive impact on the coordination level among major stakeholders. The city government officials who are confronted with heavy time constraint may resort to cut ting-corners strategies, skipping the negotiation strategy with neighboring residents.[7] This type of public policy would

6 To activate this negative loop, at least two conditions should be fulfilled. First, there should be no internal strife over the compensation. Secondly, the compensation amount of the public unit should be acceptable for the residents. Otherwise, the participation level would be transformed into negative loop, which would exert negative impact on the negotiation level, extending the time schedule.

7 In Korea, the negotiation approach in the public arena which is almost 20 years old, is not so popular as that of the private sector. Still, most of city government officials are not well exposed to the modern negotiation theories. If they could not finish the

provoke additional round(s) of escalating the overall level of conflict and public grievances.

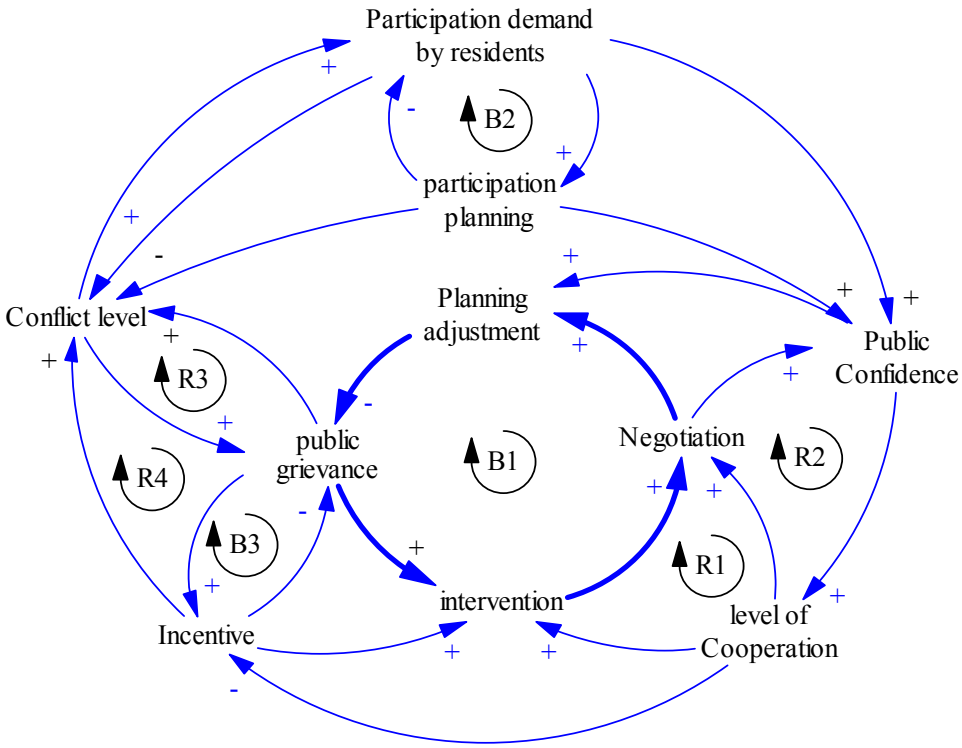

Figure 1: Crematory Causal Loop Diagram (Draft)

2) Crematory Stock-Flow Diagrams

Figure 2 presents a simplified version of stock-flow diagram which reflects the three dimensions of negotiation and adjustment, public confidence and participation demands, public confidence, respectively. Concerned with quantification questions, this research adopts the normalized unit modeling elementary relationship (NUMBER) technique in defining the relationship of key variables.

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project on time, they may even endure verbal or non-verbal punishment and censorship. Also, the subsidies provided by the central government would be restored to the central government in Korea

At the same time, Table 2 summarizes definitions and functions of key variables. In the simulation works, it assumes that negotiation variables start from zero, which means no negotiation among stakeholders. And its maximum value would be 1, implying that the overall consensus is reached. In the model, the default value sets to 0.5. Public grievance variables also move between 0 and 1. Here, zero stands for consensus and 1 for the opposite situation. Lastly, citizen participation variables, reflecting the contact frequency and level of information sharing are, adjusted according to their individually weighted values.

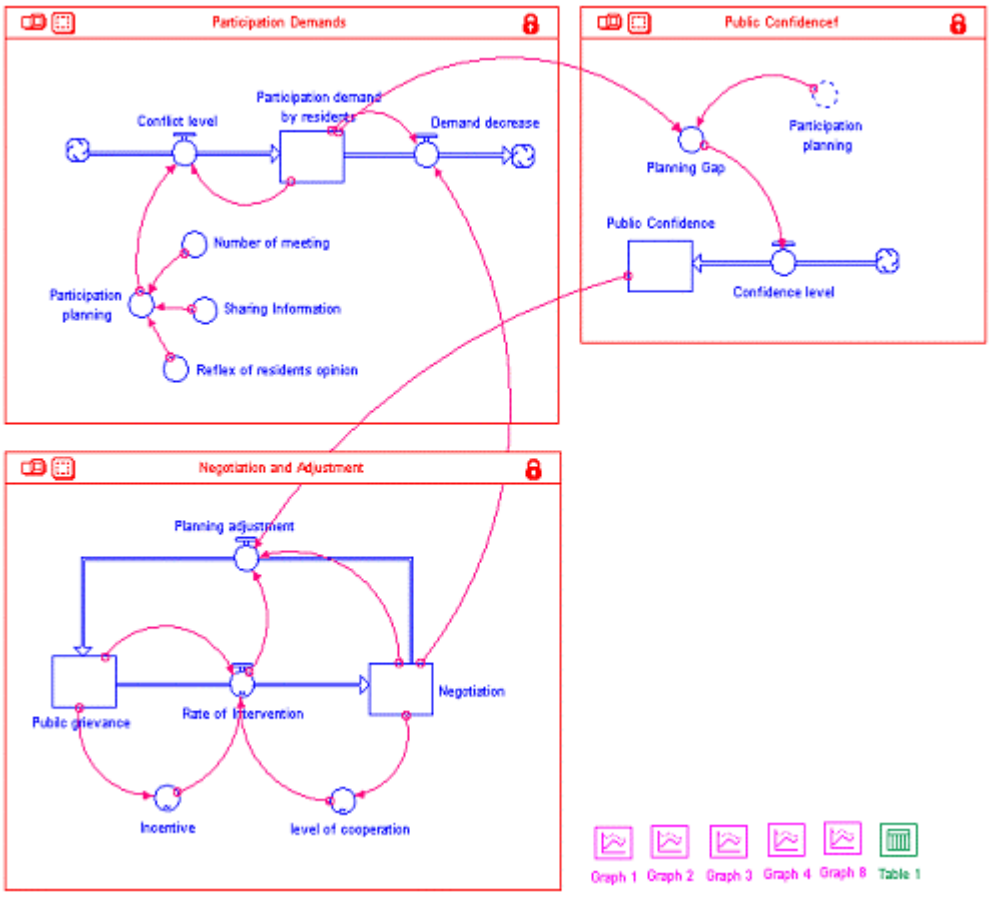


Figure 2: Crematory Stock-Flow Diagrams

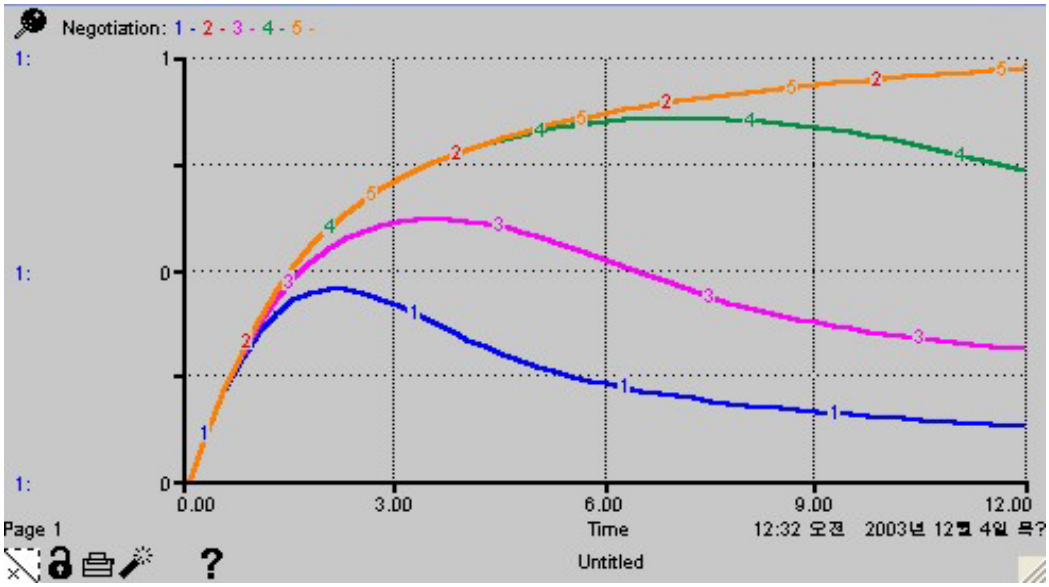
Table 2: Definitions and Functions of Key Variables

Variables	Equations
Negotiation and Adjustment	Negotiation(t)= Negotiation(t-dt)+(Rate_of_Intervention-Planning_adjustment)*dt INIT Negotiation = 0 INFLOWS: Rate_of_Intervention= Pubilc_grievance*((level_of_cooperation+Incentive)/2) OUTFLOWS: Planning_adjustment = Negotiation*Participation_demand_by_residents*Rate_of_Intervention Pubilc_grievance(t) = Pubilc_grievance(t-dt)+(Planning_adjustment-Rate_of_Intervention)* dt INIT Pubilc_grievance = 1 INFLOWS: Planning_adjustment = Negotiation*Participation_demand_by_residents*Rate_of_Intervention OUTFLOWS: Rate_of_Intervention = Pubilc_grievance*((level_of_cooperation+Incentive)/2) Incentive = GRAPH(Pubilc_grievance) level_of_cooperation = GRAPH(Negotiation)
Participation demand	Participation_demand_by_residents(t) = Participation_demand_by_residents(t-dt)+(Conflict_level-Demand_decrease)* dt INIT Participation_demand_by_residents = 0.5 INFLOWS: Conflict_level = Unilateral_planning*(1-Participation_demand_by_residents) OUTFLOWS: Demand_decrease = Participation_demand_by_residents*Negotiation Normal_planning_fraction = Participation_demand_by_residents Number_of_meeting = 0.1 Reflex_of_residents_opinion = 0.1 Sharing_Information = 0.1 Unilateral_planning = GRAPH((Reflex_of_residents_opinion+Number_of_ meeting+Sharing_Information)/3*Normal_planning_fraction)
Public confidence	Public_Confidence(t)=Public_Confidence(t)-(dt)+(Confidence_level)*dt INIT Public_Confidence=0 INFLOWS: Confidence_level=planning_Gap Planning_Gap=Participation_planning-Participation_demand_by_residents

IV. Simulation Works

Graph 2 and 5 in Figure 3 present what happens if negotiation techniques are introduced from the early stage. Not like graphs 1, 3, and 4, which present increasing trends in the first half and collapsing patterns in the second half, the consensus level presents ever-increasing trends during the study period. All these results indicate the importance of the negotiation approach from the very beginning stage. Based on the simulation works,

the negotiation effect is maximized in a year or so. As shown in graph 5, the number of contact is not so significant as information sharing and reflex of public opinion raised by neighboring residents.



Notes:

Graph 1 = contact(0), information sharing(0), reflex of public opinion(0)

Graph 2 = contact(1), information sharing(1), reflex of public opinion(1)

Graph 3 = contact(1), information sharing(1), reflex of public opinion(0)

Graph 4 = contact(1), information sharing(0), reflex of public opinion(1)

Graph 5 = contact(0), information sharing(1), reflex of public opinion(1)

Figure 3: Negotiation Approaches Based on Participatory Planning

In specific, Graph 2 in the Figure 4 represents movement of planning adjustment rate when key stakeholders adopt negotiation from the beginning stage. In this experiment, the planning adjustment seems most active when the conflict level hits the bottom.

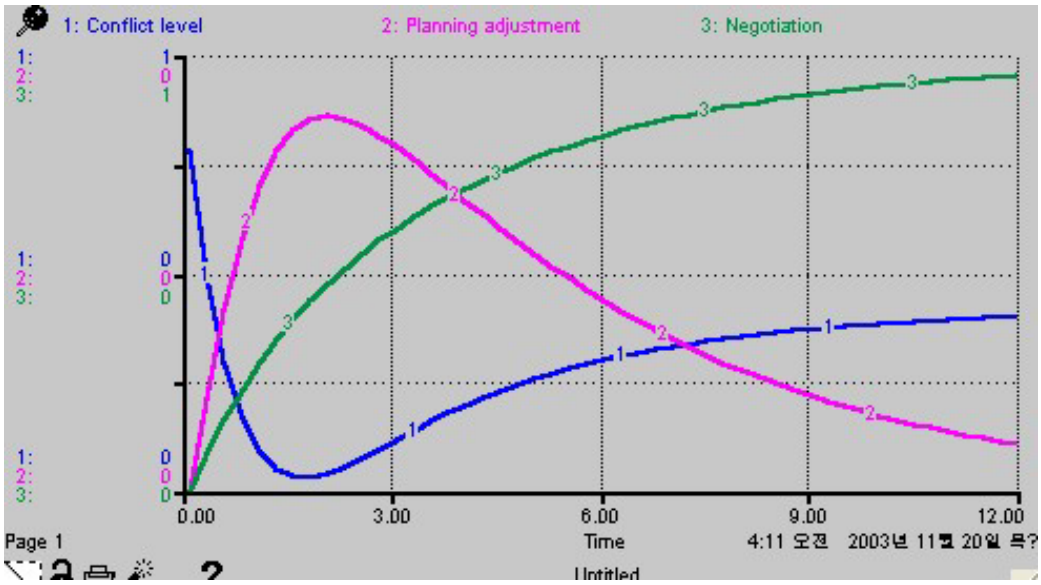


Figure 4: Simulation Based on Planning Adjustment

Figure 5 represents loci of public grievance and participation demand variables under the proposed negotiation approach. Similar to the previous examples, after kicking-off, the public participation demand is overshot and collapsed in the very beginning stage. This result implies that the negotiation approach could handle diverse issues raised by the neighboring residents. In this situation, the total volume of public grievance would be diminished over time.

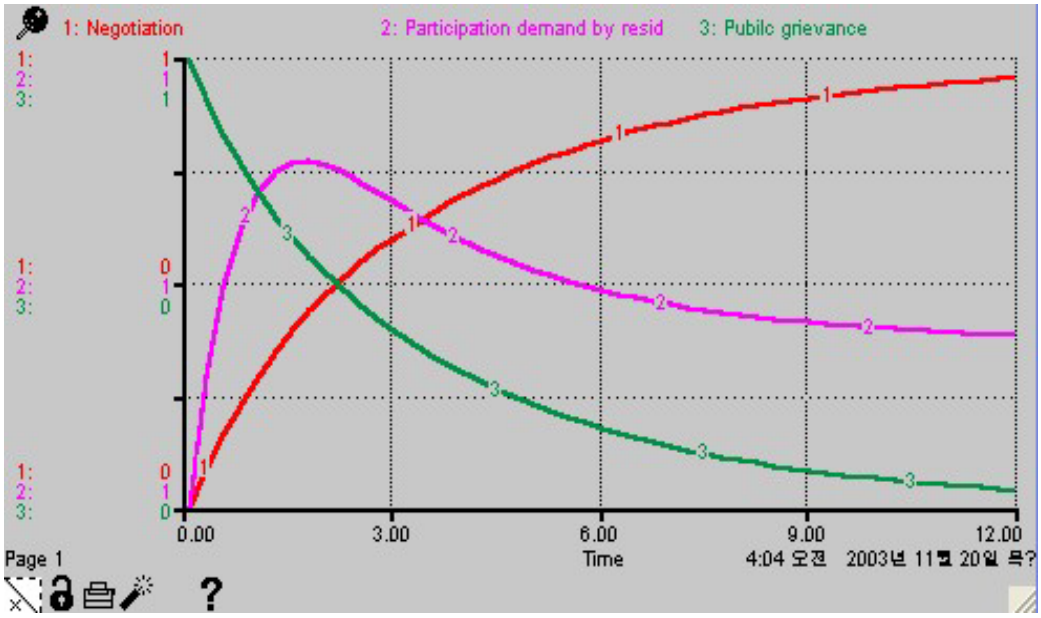


Figure 5: Simulation of Planning Performance Rate

V. Conclusions

Even though the crematory demand has rapidly increased in Korea, crematory facilities have been regarded as ones of the typical IMBY facilities: their location is not welcomed or even hated by the neighboring residents. At present, the NIMBY location project has to be repeatedly delayed, even if the local and central governments prepared the required budget and subsidies.

Using the Cheongju crematory case, this study focuses on the NIMBY's project structure, usually causing undue social expenses, not to mention the procrastination cost. After simulation works, this study finds that the compensation-oriented strategy would not be appropriate for the location conflict management of NIMBY facilities as it would easily enlarge citizen's expectation and request. Instead, it finds that the negotiation model would record relatively higher achievement after the stakeholders agree on the major issues, even though it has to endure poor record in the early stage.

This study highlights the planning stage of NIMBY facilities, excluding procrastinating factors in the operation and management steps. Nonetheless, it presents a couple of policy recommendations in a broader perspective. First of all, the proposed negotiation

approach would be applicable to other types of NIMBY facilities as it would enhance both the reliability level and the project performance in relatively a shorter time, Secondly, it reminds that society as a whole should pay attention to the negotiation preconditions among major stakeholders. Even though the negotiation models require more human and material resources in the very beginning stage, as they have to deal with diverse grievances raised by major stake-holders, stakeholders should be ready to accept the simple fact that most of them would bound for strengthening reinforcing loops within the complex conflict structure.

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