

## A Descriptive Analysis of Project Participants' Perception about Complaint in Public Construction Projects

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**Abstract:** Conflicts in public construction projects become more serious and complex so that they have a negative effect on performance of projects. Conflicts in public construction projects are defined as expanding in complaints. This study analyzes the relationship structure and effect on performance between complaints and conflicts. First of all, 219 survey data collected from industry experts were used to derive complaints arising from the project and to understand the characteristics of each complaint. In the case of environmental damages, rather than environmental damage during construction, harmful substances or effects that can occur in completed facilities cause complaints from local residents, and opposition from environmental groups has a great effect on time and cost increase. As for safety damage, civil complaints related to prevention and countermeasures for safety accidents occur frequently, and additional construction affects cost increases. Through this study, it is possible to understand the serious complaints that are prone to conflict in public construction projects, their frequency, and the performance of the project.

**Key words:** conflict management, stakeholder management, complaint and conflict, construction project, public conflict

### 1. INTRODUCTION

Because various stakeholders participate in a construction project, conflicts arise due to their interests [1]. Conflict management is very important because conflicts in construction projects have negative effects such as increase in construction cost and schedule delay. The first step in conflict management for a construction project is to identify the cause of the conflict [2, 3, 4]. A concern about a construction project usually begins with a complaint [5, 6]. Since a construction project is a site-oriented project rather than producing or developing a product in a closed space such as a factory or plant, it is influenced by and affected by the surrounding environment. In the case of a project in downtown, project participants should think about how to create a detour that affects vehicles and pedestrians and in commercial areas. In the case of construction near residential areas, the rise or fall of land prices may be affected depending on the type of facility. Disposal is requested

from project participants or local ministries for inconvenience, safety issues, and environmental issues that occur during the construction project. However, if the complainant is not satisfied with the outcome of the complaint or if the complaint is not accepted and the complainant continues to oppose the project, it will escalate into a conflict. Therefore, it is necessary to pay attention to complaints in order to find the root trigger point of conflict, and to understand the relationship between complaints and conflicts. This study aims to examine the potential, frequency, and effect on performance through descriptive statistics of complaints.

## **2. LITERATURE REVIEW: COMPLAINTS AND CONFLICTS**

The terms conflict and complaint are generally used interchangeably or with the same meaning in the construction business, but they are clearly different. Conflict means an argument, protest, or suit due to differences between two or more groups [5, 6, 7, 8]. Research related to conflict in construction projects has been continuously conducted, and as the importance of conflict increases, research is being conducted from various perspectives. Because conflict occurs due to differences in interests and perceptions between stakeholders, research is actively being conducted as a stakeholder management study. In particular, this study is limited to conflicts between external stakeholders in public construction projects.

On the other hand, a complaint refers to a request for a specific action by the complainant to deal with the complaint, improvement, to the administrative agency. A complaint refers to a request for a specific action by the complainant to deal with the complaint or improvement to the administrative agency [9, 10, 11]. Conflicts appear as suits or protests due to differences of opinion between stakeholders, but complaints do not appear as actions because they ask for improvements in project or administrative inconveniences. Complaints becomes conflicts when appropriate measures to complaints are not taken or when they are dissatisfied with the project [5, 6]. Therefore, it is necessary to identify the complaint factor, which is highly likely to become a conflict, and the relationship between complaint and conflict.

## **3. SURVEYING**

### **3.1. Complaint factors**

In order to understand the structural relationship between complaints and conflicts occurring in construction projects, the factors of complaints were first investigated and classified. Hussain et al. derived 26 items by classifying factors causing delays in construction projects in Pakistan into economic-related factors and social-related factors [14]. Carretero-Ayuso et al. identified 92 complaints arising from building projects in Spain [15]. Lee and Choi identified 30 complaints in the environmental field that occur in the ecosystem [16]. Hong et al. derived 18 attributes that cause environmental complaints in construction projects [17].

In this study, complaints derived from construction projects are divided into five aspects (Table 1). First, the residents' requirements for facilities and projects. Complaints against the project's purpose, such as inconvenience caused by the project, improvement of facility convenience, feasibility assessment, and environmental impact assessment are included [14, 18]. In rest and green areas, expansion of sports facilities, in a large-scale facility construction or development project, residents of nearby areas demand welfare for green space or sports facilities as compensation for facility construction. Re-investigation of the project feasibility study or re-investigation of environmental impact assessment is a request to re-implement a project because residents have low confidence in the feasibility study and environmental impact assessment. Complaints related to location and route selection such as Not-In-My-Backyard (NIMBY) and

Please-In-My-Front-Yard (PIMFY) were also identified as important [14, 18, 19]. NIMBY and PIMFY were seen as important complaint factors in many studies due to opposition to non-preferred facilities and competition to attract preferred facilities.

Second, the lack of publicity and guidance on the project is related to presentation for residents and guidance on construction progress [20, 21]. First, because the presentation for residents has not been sufficiently implemented, complaints arose demanding that residents participate in additional presentations. In addition, there are many complaints arising from insufficient construction information such as construction sign, detour, construction period and section, and construction progress during construction.

Third, as it relates to compensation for damage to residents during construction, it is highly related to compensation [14, 15, 18, 19]. The complaints most frequently mentioned in previous studies are compensation for damage that occurs during construction, such as cracks and pipeline damage due to excavation. The issue of the right to sunlight is often discussed in the media. In addition, compensation for indirect economic damage such as land price and image decline due to facilities was also derived.

The fourth is complaints related to environmental damage, including air and water pollution during construction and the harmfulness of facilities [16, 17, 18]. Complaints about air, water and soil pollution are those that local residents receive directly from construction. Complaints from civic groups, such as environmental organizations and NGOs (non-governmental organizations), for harmful facilities such as radioactive waste sites and transmission lines, arguing that the facilities cause destruction of the surrounding ecosystem.

Lastly, concerns about accidents during construction and countermeasures related to safety damage complaints arose [15, 18, 22]. Local residents may demand countermeasures against landslides due to floods or heavy rains, and also demand facilities for traffic safety nearby due to construction such as temporary pedestrian roads.

**Table 1.** Statement about complaint factors

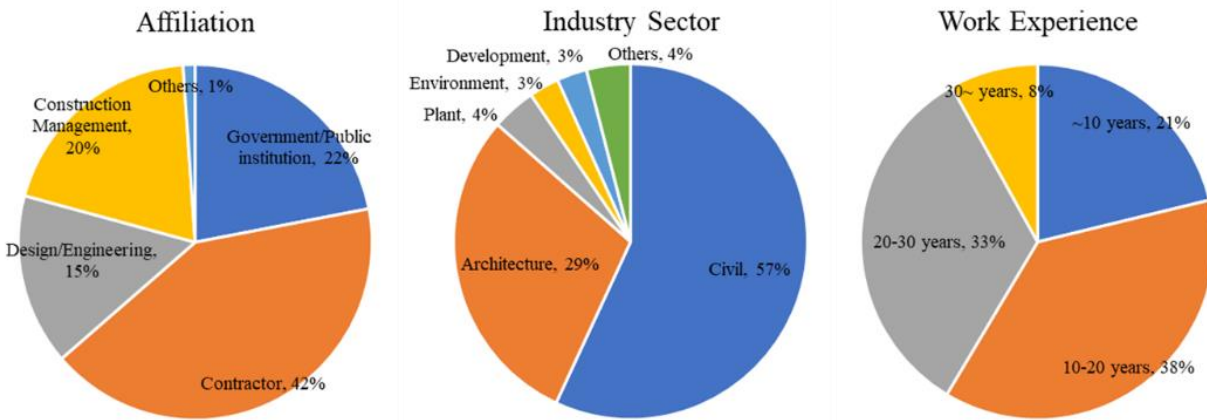
Category		Complaint factor	Reference
Residents' requirement for facilities and projects	1-1	Rest and green areas	[18]
	1-2	Expansion of sports facilities	[18]
	1-3	Inconvenience of using public facilities	[14]
	1-4	Re-investigation of project feasibility study	[18]
	1-5	Re-investigation of environmental impact assessment	[18]
	1-6	Opposition from residents' dissatisfaction	[22]
	1-7	NIMBY (Not In My Back Yard)	[18], [19], [20]
	1-8	PIMFY (Please In My Front Yard)	[18], [19], [20]
	1-9	Changes in technology and methods	[20], [22]
Lack of information for projects	2-1	Absence and lack of presentation for residents	[21], [22]
	2-2	Residents' participation in presentation for residents	[21], [22]
	2-3	Installation a construction sign	[21], [22]
	2-4	Guidance on construction period & section	[21], [22]
	2-5	Report on the proceedings	[21], [22]
	2-6	Guidance on detour	[16]
	3-1	Compensation for crack and ground subsidence by excavation	[15]

Human and material damages	3-2	Compensation for damage to the underground pipe	[15]
	3-3	Compensation for violation of the right to sunlight and view	[16]
	3-4	Compensation for obstacles and residual land	[20], [19]
	3-5	Demand for livelihood support and countermeasures	[14], [18]
	3-6	Compensation for land price declined due to damaged image	[18], [19]
	3-7	Compensation for falling sales of local business	[14], [19]
	Environmental damages	4-1	Countermeasures against air pollution
4-2		Countermeasures against water pollution	[16], [17], [18]
4-3		Contamination around construction sites by machinery	[16], [17]
4-4		Lower groundwater level and depletion	[15]
4-5		Controversy raised by civic or environmental organizations	[19]
4-6		Electromagnetic waves and radioactivity generated by facilities	[16], [17], [18]
4-7		Compensation for damages caused by dust, noise, vibration	[16], [18]
Safety damages	5-1	Drainage plan for flooding near facilities	[15]
	5-2	Spills of soil due to rainfall	[22]
	5-3	Collapse of temporary buildings according to rainfall	[22]
	5-4	Traffic safety facilities	[18]
	5-5	Safety measures to prevent falling rocks	[18]
	5-6	Temporary pedestrian road	[14]

### 3.2. Data collection

A questionnaire was constructed based on the derived complaints for structural analysis of complaints and conflicts. The potential to conflict, frequency of occurrence of each complaint, effect on performance, and response method were evaluated. Potential, which means how serious the complaint is and how likely it is to escalate into a conflict, is evaluated on a 5-point Likert scale for the possibility of aggravating a complaint into a conflict. Frequency is evaluated on a 5-point Likert scale with respect to the frequency of complaints during construction projects. In effect, the level of impact of complaints on the performance of project of change order, cost, and schedule is also evaluated as none, low, or high. If there was no increase in change order, cost, or schedule due to complaints, it was rated as 1 point, low as 2 points, and high as 5 points.

The survey was distributed to employees working at construction industry in South Korea and a total of 219 survey responses were collected through an online and offline survey. The data were collected from various affiliation and industry sectors (Figure 1). In affiliation, contractor employees account for 42%, following 22% and 20% of government/public institution and construction management. In industry sector, civil sector employees account for 58%, following 30% of architecture sector, with 42% from contractor and 58% from the civil sector. The civil and architecture have most portion of respondents. In terms of work experience, respondents had an average of 19.0 years of industry experience.



**Figure 1.** Distribution of survey respondents

## 4. RESULTS

### 4.1. Complaint description

This study examines the relationship between complaint and conflict in terms of frequency, potential, and effect on performance. Based on the complaint information derived from the expert survey and factor analysis, statistical analysis results of complaints are described (Table 2).

Most of the factors for residents' requirement for facilities and projects showed high values in the evaluation items. In particular, all factors had a higher impact on the cost increase than the average, and also showed a high effect on potential and schedule increases. In particular, in opposition from residents' dissatisfaction (1-6), the values of all items were higher than the average; and NIMBY (1-7) and PIMFY (1-8) also had a great influence on change order and cost. These factors are highly likely to lead to conflict because they are not complaints that occur during construction but protests and demands against the project's purpose. In addition, significant time and money is needed to respond because these types of complaints require site selection and change of construction methods, rather than just physical alternatives such as compensation or detour. However, since they were not simple complaints, the frequency was mostly low.

In the variable lack of information for projects, most factors did not yield high results for all evaluation items. Absence and lack of presentation for residents (2-1), residents' participation in presentation for residents (2-2), and frequency of installation of a construction sign (2-3) was slightly higher than the average, but these are complaints that can occur in general during construction. Therefore, these factors do not occur frequently and have a low possibility of escalating into conflicts.

Since human and material damages are complaints related to compensation problems, it has been shown to have a significant impact on cost increase. Complaints related to recovery from physical damage were found to be time consuming (3-1, 3-2, 3-3, 3-4). However, the effect or frequency of damage to land price decline or sales of commercial districts were found to be low (3-6, 3-7). This means that compensation for direct damage that occurs during construction is very important.

In environmental damages, complaints from civic and environmental organizations (4-5) frequently occurred in environmental damages, which had a significant impact on time and cost increase. Compensation complaints from local residents for dust, noise, and vibration (4-7) are common in construction projects. However, complaints from civic and environmental organizations are easily exposed to the media and, if not dealt with promptly and effectively, can escalate into serious environmental conflicts.

The safety damage factor was found to have a significant effect on cost increase, although the potential for conflict was not large. Even without compensation, safety facilities such as detours and pedestrian paths must be installed, and additional construction is required to solve safety problems, which has a significant impact on cost increase.

**Table 2.** Descriptive statistics of complaint factors

No.	Potential	Frequency	Effect on performance		
			Change order	Cost	Schedule
1-1	2.38	2.47	3.00	3.32	2.67
1-2	2.23	2.17	2.76	3.06	2.53
1-3	2.59	2.90	2.90	3.08	2.62
1-4	3.09	2.01	2.88	3.09	3.41
1-5	3.16	2.20	2.92	3.10	3.38
1-6	3.68	3.40	3.11	3.72	4.09
1-7	3.56	2.95	3.69	3.89	4.02
1-8	3.19	2.66	3.47	3.64	3.70
1-9	2.62	2.37	3.52	3.69	3.38
2-1	2.76	3.09	2.07	2.42	2.33
2-2	2.79	3.17	2.13	2.31	2.22
2-3	2.00	3.07	1.82	2.38	1.58
2-4	1.96	2.95	1.63	1.94	1.55
2-5	1.95	2.96	1.63	1.90	1.59
2-6	2.26	3.00	1.95	2.28	1.79
3-1	3.64	3.31	3.32	4.18	3.73
3-2	3.21	2.70	2.69	3.72	3.17
3-3	3.53	2.92	2.97	3.49	3.03
3-4	3.07	3.28	2.89	3.75	3.09
3-5	2.84	2.60	2.00	2.96	2.42
3-6	2.73	2.25	1.74	2.53	2.13
3-7	2.82	2.66	1.87	2.77	2.27
4-1	2.94	2.97	2.38	2.98	2.40
4-2	2.93	2.87	2.46	3.01	2.38
4-3	2.98	3.40	2.20	2.94	2.32
4-4	2.90	2.51	2.55	3.00	2.48
4-5	3.51	3.36	2.86	3.37	3.42
4-6	2.68	2.18	2.30	2.66	2.54
4-7	3.68	3.93	2.94	3.70	2.94
5-1	3.00	2.85	2.95	3.37	2.50
5-2	2.99	3.17	2.82	3.28	2.44
5-3	2.84	2.55	2.50	3.06	2.45
5-4	2.79	3.29	2.71	3.03	2.17
5-5	2.72	2.79	2.96	3.16	2.47
5-6	2.89	3.28	2.66	2.94	2.23

## 5. CONCLUSION

In this study, the attributes of complaints were analyzed by conducting a questionnaire from employees in the construction industry. Overall, residents' requirements for facilities and projects do not occur often, but they have high potential and have a significant impact on effect on performance. In particular, in the case of objection from residents to NIMBY and PIMFY and the project, it may escalate into a conflict and it may be necessary to reselect the location and route. In that case, change order, cost, and schedule all have a huge impact. Lack of information for projects occurs frequently, but it is a common complaint that may occur during construction and does not cause conflicts or significantly affect performance. In the complaints related to human and material damages, direct compensation for damages incurred during construction was a key issue. Because it affects the cost and time a lot, the owners or contractors need intensive management in the construction stage. Complaints related to environmental damages are frequent, but not serious, factors that occur during construction, while factors related to harm to human bodies and environmental pollution can escalate into serious conflicts. The most effective way to reduce environmental complaints is to proceed with the project after resolving not only environmental impact assessment in the planning and design stages, but also coordination with local residents. Safety complaints may not significantly affect conflict if robust design, safety devices, and detours are properly installed. Through this study, civil complaints in general construction projects can be identified. In this study, it is possible to understand the serious complaints that are prone to conflict in public construction projects, their frequency, and the performance of the project. Through the research results, it is possible to identify the major complaints that need to be managed in order to prevent conflict. Although evaluations were made for each complaint through the questionnaire, there is a limitation in that the analysis of the process by which complaints are expanded into conflicts is insufficient. Therefore, an empirical study on the occurrence of complaints is necessary. In addition, since conflicts appear differently depending on the construction project type and stakeholders, an in-depth analysis is required. In future research, it is necessary to study differences in complaints according to stakeholders and project types and management strategies.

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