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Benchmarking Complaint Management of Public Constructuin Projects in Korea

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Abstract: Public construction projects have a significant impact on the local residents' economy and social lives due to their large scale and construction costs. If residents suffer losses and damages from public construction projects, it can lead to complaints, which can negatively affect to the projects, such as cost overrun and schedule delay. Therefore, the managerial efforts should be made to minimize these complaints. The purpose of this study is to analyze the complaints associated with construction projects based on their characteristics and assess the impact of complaints on the projects, aiming to minimize the complaints arising from construction projects. This study is conducted in three steps: 1) extracting the complaints' information from the existing construction projects, 2) analyzing the complaints based on projects characteristics using post-evaluation data, and 3) analyzing how the complaints are actually handled. Through this study, it is possible to understand the characteristics of complaints in actual public construction projects in Korea.

Key words: complaint, construction project, complaint management, stakeholder management

1. INTRODUCTION

Construction projects are often large, complex, and involve various stakeholders, which can lead to social conflicts and misunderstandings [1]. Projects in urban areas can cause inconveniences such as noise, dust, and disruptions to daily life for residents near construction sites. Projects near residential areas can significantly impact property values depending on the type of facilities being constructed. When damages caused by construction projects become severe or persistent, nearby residents may file complaints to minimize their losses. This can potentially escalate into conflicts or disputes between affected residents and construction companies. While such conflicts or disputes can be resolved through mutual agreement, prolonged disputes may result in significant losses for construction companies, including project suspension and compensation payments. To successfully complete construction projects, it is essential to analyze the factors causing complaints based on project characteristics and minimize them. This study aims to classify complaint factors based on project characteristics using post-evaluation report data.

2. LITERATURE REVIEW

Complaints refer to specific requests made by individuals to administrative agencies for handling, improvement, or other concrete measures. If appropriate actions are not taken in response to complaints, they can lead to conflicts or disputes. Moreover, complaints in construction projects often result in increased construction costs and delays, leading to significant losses for construction companies. As a result, numerous studies have been conducted to prevent complaints in construction projects. Carretero-Ayuso et al.(2018) identified 92 complaints arising from construction projects in Spain [2]. Lee and Choi(2020) derived 30 types of environmental complaints [3]. Hong et al.(2020) classified environmental-related complaints in construction projects into 18 factors [4]. Wiejaczka et al.(2018) investigated complaints related to dam and reservoir construction in the Tisza River Basin [5].

While existing studies have provided general classifications of complaint types and response strategies, they did not classify complaints considering project characteristics. However, this paper performs a study to classify complaint types based on project characteristics using post-evaluation data.

3. MATERIALS AND METHODS

3.1. Research scope

This study aims to classify complaint factors by project characteristics using complaint data from post-evaluation reports written in Korea from 2013 to 2023.

3.2. Data collection

Over the course of 10 years, a total of 1,040 construction projects were accomplished and documented in post-evaluation reports. After excluding projects with corrosion, omissions, and similar issues, 488 projects were selected among them. In this study, complaints were classified into eight categories based on project characteristics, including roads, railways, and buildings, among others. Furthermore, these categories were subdivided into 19 specific project types (Figure 1).

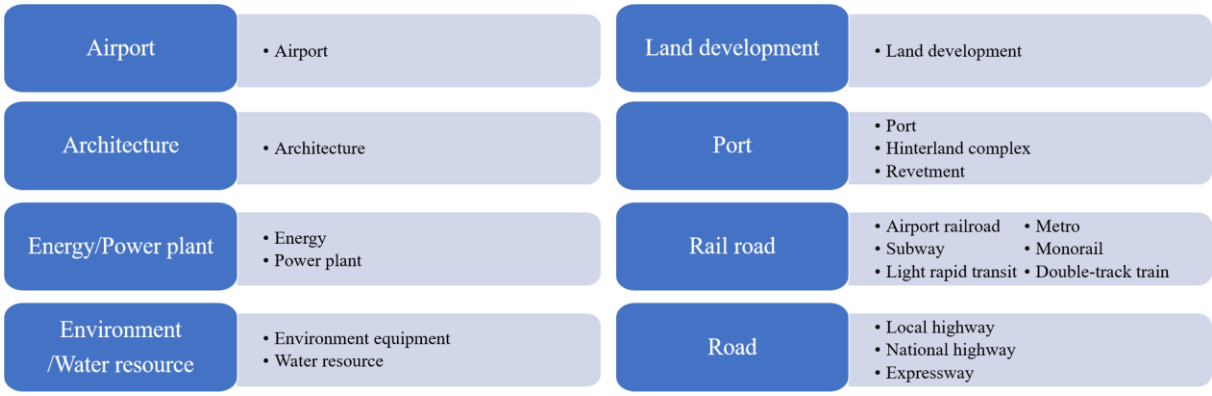

Figure 1. Construction project calssification

3.3. Method of analysis

This study investigated complaints documented in post-evaluation reports to identify dissatisfaction based on project characteristics. Initially, a content analysis was conducted on the documented complaints, utilizing a complaint classification system proposed in previous research to reclassify them into six aspects. Subsequently, complaints were categorized according to project characteristics, and this process was completed using Microsoft Excel. From 2013 to 2023, a total of 45,522 complaints were analyzed, with a detailed examination of 43,389 complaints conducted in this study.

In this research, complaints arising from construction projects were classified into six aspects (Table 1). Firstly, Residents' demands regarding facilities and projects involve dissatisfaction from local residents demanding welfare-related facilities such as the expansion of sports facilities, parking spaces, and convenience facilities. Complaints related to facility location and route selection, such as NIMBY(Not In My Back Yard) and PIMFY(Please In My Front Yard).

Secondly, Inconvenience to residential life of the construction site includes complaints related to the inconvenience caused by construction activities for residents living near the construction site. This encompasses issues such as traffic inconvenience due to construction materials and structures, congestion caused by construction activities, inconvenience in using public facilities, and difficulty

accessing residential areas. Additionally, complaints about excessive operational and heating costs resulting from facility construction are also noted.

Thirdly, Lack of information for projects is associated with community briefings and project information. Complaints arise when community briefings are insufficient, leading to demands for additional explanatory sessions. Insufficient information related to projects, such as environmental impact assessments, appraisal results, project duration and sections, and signage during construction, results in complaints.

Fourthly, Property damages are complaints related to compensation for damages incurred during construction, such as building and pipeline damage due to blasting and excavation. Complaints related to rights concerning daylight and scenic views are also present. Indirect economic damages, such as land value decline and business losses, result in compensation-related complaints.

Fifthly, complaints are related to direct environmental damage to local residents caused by construction activities. This includes residents' dissatisfaction and demands for measures regarding air, water, and soil pollution. Opposition to construction due to environmental concerns and complaints arising from worries about groundwater level reduction are also included.

Finally, complaints focus on concerns about accidents during construction and safety hazards. Local residents demand flood prevention measures due to floods and heavy rainfall, as well as requesting facilities and measures for safety near the construction site, such as temporary pedestrian paths, traffic safety facilities, and safety measures for facilities.

Table 1. Statement about construction factors

Category		Complaint factor
Residents' demands for facilities and projects	1-1	Rest and green areas
	1-2	Expansion of sports facilities
	1-3	Expansion of parking space
	1-4	Expansion of convenienc facilities
	1-5	Installation of heating and cooling faciltiies within buildings
	1-6	Opening of access roads
	1-7	Repair work due to damage to facilities
	1-8	NIMBY (Not In My Back Yard)
	1-9	PIMFY (Please In My Front Yard)
	1-10	Changes in method and design
Inconvenience to residential life of the construction site	2-1	Traffic inconvenience due to construction materials and structures
	2-2	Traffic jam due to construction activities
	2-3	Inconvenient access to living quarters due to construction
	2-4	Inconvenience of using public facilities
	2-5	Excessive calculation of operation and heating expenses
Lack of information for projects	3-1	Additional resident presentation
	3-2	Disclosure of information such as environmental impact assessment report and appraisal result
	3-3	Guidance on construction period & section
	3-4	Installation a construction sign
Property damages	4-1	Compensation for building damage by blasting & excavation
	4-2	Compensation for damage to the underground pipe
	4-3	Compensation for violation of the right to sunlight and view
	4-4	Compensation for obstacle and residual land
	4-5	Compensation for land price decline
	4-6	Compensation for falling sales of local business
	4-7	Demand for livehood support and countermeasures
Environmental damages	5-1	Compensation for damages caused by dust, noise, vibration
	5-2	Compensation for damages caused by loss of trees
	5-3	Opposition to construction due to concerns about environmental pollution
	5-4	Countermeasures against bad odors and waste generated from facilities
	5-5	Countermeasures to prevent inflow of pollutants such as fugitive emissions, dust, rainwater
	5-6	Lower grounwater level and depletion
Safety damages	6-1	Drainage plan for flooding near facilities

6-2	Traffic safety facilities
6-3	Demand for road maintenance near the construction site
6-4	Temporary pedestrian road
6-5	Detour and auxiliary road
6-6	Demand for safety measeres for facilities

4. RESULTS

This study categorized the complaints recorded in post-evaluation reports of construction projects into six aspects and classified them based on project characteristics. Construction projects were categorized into eight types, and projects with fewer than 10 instances, such as airports, construction, and energy/plant projects, were excluded from this study.

4.1. Complaints from environment/water resouce construction

The complaints related to Environment/water resource totaled 1,368 cases among the subjects of analysis. Excluding malicious complaints and simple inquiries, 1,191 cases were classified (Table 2). The most common complaints in Environment/Water Resource were identified as Countermeasures against bad odors and waste generated from facilities (36.3%). Following that, Compensation for obstacles and residual land (24.1%) and Demand for livelihood support and countermeasures (22.8%) were the next most frequently occurring issues. This is thought to be because facilities such as dams and sewage treatment plants included in environment/water resource projects can directly or indirectly affect the environment, with a high likelihood of generating unpleasant elements such as odors. Additionally, as they are classified as facilities that residents tend to avoid, it is believed that complaints related to compensation also frequently arise.

Table 2. Description of complaint factors from environment/water resourece project

	Complaint factor	Count	Ratio(%)	Rank
1-1	Rest and green areas	1	0.1	17
1-2	Expansion of sports facilities	1	0.1	17
1-4	Expansion of convenienc facilities	5	0.4	14
1-6	Opening of access roads	9	0.8	11
1-8	NIMBY (Not In My Back Yard)	21	1.8	6
1-10	Changes in method and design	6	0.5	13
2-2	Traffic jam due to construction activities	14	1.2	9
3-1	Additional resident presentation	2	0.2	16
3-2	Disclosure of information such as environmental impact assessment report and appraisal result	61	5.1	4
4-2	Compensation for damage to the underground pipe	3	0.3	15
4-4	Compensation for obstacle and residual land	287	24.1	2
4-7	Demand for livehood support and countermeasures	272	22.8	3
5-1	Compensation for damages caused by dust, noise, vibration	25	2.1	5
5-3	Opposition to construction due to concerns about environmental pollution	7	0.6	12
5-4	Countermeasures against bad odors and waste generated from facilities	432	36.3	1
6-1	Drainage plan for flooding near facilities	11	0.9	10
6-2	Traffic safety facilities	1	0.1	17
6-3	Demand for road maintenance near the construction site	17	1.4	7
6-6	Demand for safety measeres for facilities	16	1.3	8

4.2. Complaints from land development construction

Out of the total 2744 complaints arising from the Land development project, complaints related to subcontractors, miscellaneous issues, and demands for sales acceleration were excluded, leaving 2056 complaints for classification (Table 3). Among these, Traffic safety facilities (22.8%) accounted for the highest number of occurrences in the Land development project. It was followed by Repair work due to damage to facilities (20.8%) and Demand for road maintenance near the construction site (14.7%), respectively. In large-scale facility construction or development projects, it is inferred that nearby

residents often express significant demands for welfare facilities such as traffic safety facilities, repair work due to damage to facilities, and demand for road maintenance near the construction site as compensation for the construction of the facilities.

Table 3. Description of complaint factors from land development project

	Complaint factor	Count	Ratio(%)	Rank
1-1	Rest and green areas	200	9.7	4
1-2	Expansion of sports facilities	4	0.2	20
1-3	Expansion of parking space	73	3.6	7
1-4	Expansion of convenienc facilities	15	0.7	17
1-6	Opening of access roads	44	2.1	10
1-7	Repair work due to damage to facilities	427	20.8	2
1-8	NIMBY (Not In My Back Yard)	142	6.9	5
1-10	Changes in method and design	103	5.0	6
2-1	Traffic inconvenience due to construction materials and structures	10	0.5	18
2-2	Traffic jam due to construction activities	2	0.1	22
2-3	Inconvenient access to living quarters due to construction	24	1.2	13
3-1	Additional resident presentation	3	0.1	21
4-1	Compensation for building damage by blasting & excavation	6	0.3	19
4-3	Compensation for violation of the right to sunlight and view	1	0.0	23
4-4	Compensation for obstacle and residual land	69	3.4	8
4-5	Compensation for land price decline	1	0.0	23
4-7	Demand for livehood support and countermeasures	30	1.5	11
5-1	Compensation for damages caused by dust, noise, vibration	46	2.2	9
5-4	Countermeasures against bad odors and waste generated from facilities	27	1.3	12
6-1	Drainage plan for flooding near facilities	20	1.0	14
6-2	Traffic safety facilities	469	22.8	1
6-3	Demand for road maintenance near the construction site	302	14.7	3
6-4	Temporary pedestrian road	19	0.9	15
6-5	Detour and auxiliary road	19	0.9	15

4.3. Complaints from port construction

In the port project, a total of 1,840 complaints were recorded, and excluding complaints related to fee systems, rudeness, and similar issues, 228 complaints were classified (Table 4). Among the complaints arising from the port project, Chages in method and design (73.7%), Traffic inconvenience due to construction materials and structures (7.5%) and Traffic safety facilities (7.5%). Port projects are complex and technically demanding, leading to frequent requests from residents for changes in method and design. Additionally, due to the use of various construction materials and structures, complaints related to traffic inconvenience due to construction materials and structures, as well as traffic safety facilities, are believed to arise.

Table 4. Description of complaint factors from port project

	Complaint factor	Number	Ratio(%)	Rank
1-4	Expansion of convenienc facilities	1	0.4	9
1-6	Opening of access roads	4	1.8	6
1-10	Changes in method and design	167	73.2	1
2-1	Traffic inconvenience due to construction materials and structures	17	7.5	2
3-2	Disclosure of information such as environmental impact assessment report and appraisal result	1	0.4	9
4-3	Compensation for violation of the right to sunlight and view	1	0.4	9
4-4	Compensation for obstacle and residual land	1	0.4	9

4-6	Compensation for falling sales of local business	2	0.9	8
4-7	Demand for livehood support and countermeasures	5	2.2	5
5-1	Compensation for damages caused by dust, noise, vibration	6	2.6	4
5-3	Opposition to construction due to concerns about environmental pollution	1	0.4	9
6-1	Drainage plan for flooding near facilities	4	1.8	6
6-2	Traffic safety facilities	17	7.5	2
6-6	Demand for safety measeres for facilities	1	0.4	9

4.4. Complaints from rail road construction

In the rail road project, a total of 2,080 complaints were reported. Excluding complaints related to construction delays, unpaid wages, and other similar issues, 1,974 complaints were categorized (Table 5). Among the complaints from the railway project, Compensation for building damage by blasting & excavation accounted for the highest percentage (32.1%). It was followed by Changes in method and design (24.8%) and Compensation for damages caused by dust, noise, vibration (14.2%), which were also reported frequently. Due to the nature of rail road projects involving significant excavation and blasting, it is believed that there have been numerous complaints related to compensation for damages caused by construction activities, such as compensation for building damage by blasting and excavation, as well as damages caused by dust, noise, and vibration."

Table 5. Description of complaint factors from rail road project

	Complaint factor	Count	Ratio(%)	Rank
1-3	Expansion of parking space	2	0.1	19
1-4	Expansion of convenienc facilities	72	3.6	5
1-6	Opening of access roads	50	2.5	7
1-7	Repair work due to damage to facilities	12	0.6	17
1-10	Changes in method and design	490	24.8	2
2-1	Traffic inconvenience due to construction materials and structures	15	0.8	16
2-2	Traffic jam due to construction activities	24	1.2	12
3-1	Additional resident presentation	29	1.5	11
3-2	Disclosure of information such as environmental impact assessment report and appraisal result	23	1.2	13
3-3	Guidance on construction period & section	2	0.1	19
3-4	Installation a construction sign	17	0.9	15
4-1	Compensation for building damage by blasting & excavation	633	32.1	1
4-3	Compensation for violation of the right to sunlight and view	3	0.2	18
4-4	Compensation for obstacle and residual land	132	6.7	4
4-6	Compensation for falling sales of local business	23	1.2	13
5-1	Compensation for damages caused by dust, noise, vibration	281	14.2	3
5-6	Lower grounwater level and depletion	35	1.8	9
6-1	Drainage plan for flooding near facilities	33	1.7	10
6-3	Demand for road maintenance near the construction site	44	2.2	8
6-4	Temporary pedestrian road	54	2.7	6

4.5. Complaints from road construction

Among the complaints under analysis, a total of 33,908 cases were reported in road projects. Excluding simple inquiries, fee-related complaints, wage defaults, etc., a total of 23,858 complaints were classified (Table 6). In road projects, the highest number of complaints occurred under Changes in method and design (22.2%), followed by Opening of access roads (18.2%), and Compensation for obstacle and residual land (15.5%). In road projects, there were many instances where demands for changes in method and design were raised not as dissatisfaction with the construction process but as objections to the project's purpose. Additionally, complaints related to Opening of access roads were frequent as they aimed to address inconveniences in entry and exit due to the road project's progress.

Furthermore, due to the nature of lengthy road projects, there were also significant occurrences of complaints regarding Compensation for obstacle and residual land.

Table 6. Description of complaint factors from road project

	Complaint factor	Count	Ratio(%)	Rank
1-1	Rest and green areas	10	0.0	28
1-2	Expansion of sports facilities	1	0.0	34
1-3	Expansion of parking space	12	0.1	26
1-4	Expansion of convenienc facilities	695	2.9	9
1-6	Opening of access roads	4,340	18.2	2
1-7	Repair work due to damage to facilities	275	1.2	14
1-8	NIMBY (Not In My Back Yard)	244	1.0	16
1-10	Changes in method and design	5,293	22.2	1
2-1	Traffic inconvenience due to construction materials and structures	107	0.4	19
2-2	Traffic jam due to construction activities	186	0.8	18
2-3	Inconvenient access to living quarters due to construction	222	0.9	17
3-1	Additional resident presentation	14	0.1	25
3-2	Disclosure of information such as environmental impact assessment report and appraisal result	46	0.2	21
3-3	Guidance on construction period & section	7	0.0	29
3-4	Installation a construction sign	42	0.2	23
4-1	Compensation for building damage by blasting & excavation	1,929	8.1	4
4-2	Compensation for damage to the underground pipe	900	3.8	7
4-3	Compensation for violation of the right to sunlight and view	21	0.1	24
4-4	Compensation for obstacle and residual land	3,703	15.5	3
4-5	Compensation for land price decline	3	0.0	32
4-6	Compensation for falling sales of local business	322	1.3	13
4-7	Demand for livehood support and countermeasures	381	1.6	11
5-1	Compensation for damages caused by dust, noise, vibration	1,164	4.9	6
5-2	Compensation for damages caused by loss of trees	3	0.0	32
5-3	Opposition to construction due to concerns about environmental pollution	43	0.2	22
5-4	Countermeasures against bad odors and waste generated from facilities	5	0.0	30
5-5	Countermeasures to prevent inflow of pollutants such as fugitive emissions, dust, rainwater	11	0.0	27
5-6	Lower grounwater level and depletion	5	0.0	30
6-1	Drainage plan for flooding near facilities	1,835	7.7	5
6-2	Traffic safety facilities	475	2.0	10
6-3	Demand for road maintenance near the construction site	864	3.6	8
6-4	Temporary pedestrian road	58	0.2	20
6-5	Detour and auxiliary road	368	1.5	12
6-6	Demand for safety measeres for facilities	274	1.1	15

5. CONCLUSION

This study classified complaints based on project characteristics using complaints described in domestic post-evaluation reports. In Environment/Water Resource projects, 1,191 complaints were classified into 19 categories. Property damages and environmental damages-related complaints were frequent, particularly those related to countermeasures against bad odors and waste generated from facilities. Land development projects involved 2,056 complaints classified into 24 categories. Overall, complaints related to residents' demands for facilities and projects were frequent, along with those

related to safety damages such as traffic safety facilities and demand for road maintenance near the construction site. Port projects had 228 complaints classified into 14 categories, with an overwhelming number of complaints related to changes in method and design. A total of 1,974 complaints from Rial road projects were classified into 20 categories, with many complaints related to property damages, especially compensation for building damage by blasting & excavation, reflecting the core issue of direct compensation for damages incurred during construction. 23,858 complaints from road projects were classified into 34 categories. Road projects generated a higher number of complaints compared to other projects, with many complaints related to residents' demands for facilities and projects, indicating residents' overall objections to the project, often expressed through complaints about changes in method and design and opening of access roads. This study enables understanding of the attributes of complaints arising from construction projects. While classification of complaints was conducted based on post-evaluation reports, there are limitations in analyzing the process of complaint occurrence and handling. Therefore, empirical research on complaint handling is necessary. Future research should focus on studying differences in complaints based on project types, stakeholders, and handling strategies.

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