



# Improvement Measures for Projects Subject to Environmental Impact Assessment in Urban Areas

Dong-Myung CHO<sup>1</sup>, Ju-Yeon LEE<sup>2</sup>, Woo-Taeg KWON<sup>3</sup>

1. First Author Researcher, SM Environment & Consulting.CO.,LTD, Korea, Email: envcdm@naver.com
2. Second Author Researcher, SM Environment & Consulting.CO.,LTD, Korea, Email: juyeon2723@daum.net
3. Corresponding Author Professor, Department of Environmental Health & Safety, Eulji University, Korea, Email: awtkw@eulji.ac.kr

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## Abstract

**Purpose:** The small-scale environmental impact assessment conducted during the development project stage has focused on the preservation of the natural environment centered on non-urban areas, due to the nature of urbanization, health problems for citizens of high-density urban areas have a limitation in that they are relatively neglected. In the case of strategic environmental impact assessment and environmental impact assessment in urban areas, there is no basis for evaluation in urban areas because there are exceptions to be excluded from the target projects or there are no target project regulations for buildings. Therefore, in this research, we examined the problems with the target project such as the current environmental impact assessment, and tried to establish a system improvement plan that can solve them. **Research design, data and methodology:** After reviewing the current environmental impact assessment-related laws (including enforcement ordinances) and national land planning laws (including enforcement ordinances), exceptions such as environmental impact assessment in urban areas were identified and problems were identified. Based on this, an amendment to the Enforcement Decree was proposed to provide institutional support for the expansion of target projects such as environmental impact assessment in urban areas. **Results and Conclusions:** Through this research, it is expected that the projects subject to environmental impact assessment on development projects in urban areas directly related to the health of the people will be expanded, and the net function of the environmental impact assessment system will be maximized.

**Keywords :** Strategic environmental impact assessment, Small-scale environmental impact assessment, Urban area, non-urban(=rural) area, Development activity permit, Special-purpose area

**JEL Classification Codes :** I30, I31, I38

## 1. Introduction

The characteristics of the local environmental status are the most basic matters for the sustainable development and conservation of the national land under a systematic development plan. Considering this, analysis of changes in the environmental status, etc. should be made as a premise,

and regional development should be implemented. In particular, the effect of temporal and spatial changes in surrounding environmental factors and environmental capacity by region should be evaluated through scientific and comprehensive evaluation. When implementing a development project, quantitative and scientific data are needed to review the feasibility of the development plan so

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that the overall environmental change analysis of the project can suggest an appropriate alternative to regional development from the initial planning stage. In particular, it is very important to establish current status data to respond to policy changes or environmental issues related to regional development.

In this oligopoly, scientific and quantitative analysis results are very important for the current status and development plans of development projects in the city as a whole or by region. Therefore, it is absolutely necessary to analyze and provide data that can be used for environmental evaluation support and local government development plans by analyzing the environmental status of each item and project. As a result, it is the spirit of integration in this era that is important to induce sustainable urban regional development and prevent social conflicts through this.

In Korea, the entire land is divided into four uses: an urban area, a management area, an agricultural and forestry area, and a natural environment conservation area. Among them, the three use areas of management, agriculture and forestry and natural environment conservation are defined as “areas in need of conservation” and are managed within the environmental impact assessment system.

However, development projects in urban areas that are directly related to public health are in a blind spot outside the environmental impact assessment system, except for large-scale projects.

Therefore, application of environmental impact assessment target projects to small-scale development projects in urban areas, high-density individual building new construction projects in commercial and semi-residential areas, and individual factory establishments in industrial areas with high risk of health impact close to residential areas I think we need to discuss a plan.

In addition, research to actively solve environmental issues related to development projects, which are concentrated in time and space, is very necessary in advance. The urban development policy direction in which the policy plan and development master plan conforming to the national regional development policy is presented, and it was intended to be helpful in multidisciplinary research to support the related analysis data.

## **2. Research Methodology**

The purpose of this study is to protect people's environmental rights by expanding target projects such as environmental impact assessment in urban areas, so the

following detailed contents are included.

First, by reviewing the current environmental impact assessment-related laws (including Enforcement Decree) and national land planning-related laws (including Enforcement Decree), exceptions such as environmental impact assessment in urban areas were identified and problems were identified.

Second, based on the identified problems, an amendment to the Enforcement Decree was proposed to provide institutional support for the expansion of target projects such as environmental impact assessment in urban areas.

Third, along with the system improvement plan, environmental impact assessment items suitable for urban area characteristics were additionally suggested to enhance the effectiveness of the expansion of target projects such as environmental impact assessment.

## **3. Research Results**

### **3.1. Current Status and Problems of Development Projects in the Urban Area**

#### **3.1.1. Small-scale development project in urban area**

In urban areas, the target scale for strategic and small-scale environmental impact assessment is limited to urban management plans of more than 60,000 square meters (10,000 square meters for green areas) and related projects. Small-scale district unit plans and urban planning facility projects that are less than 60,000 square meters are excluded from evaluation.

According to the current 「National Land Planning Act」, the size of the area to be determined by the urban management plan is set at a maximum of 30,000 square meters or more. However, in the 「Environmental Impact Assessment Act」, the target scale for strategies and small-scale environmental evaluations has been relaxed to more than 60,000 square meters, and a significant number of urban management plan decision projects are excluded from the evaluation target.

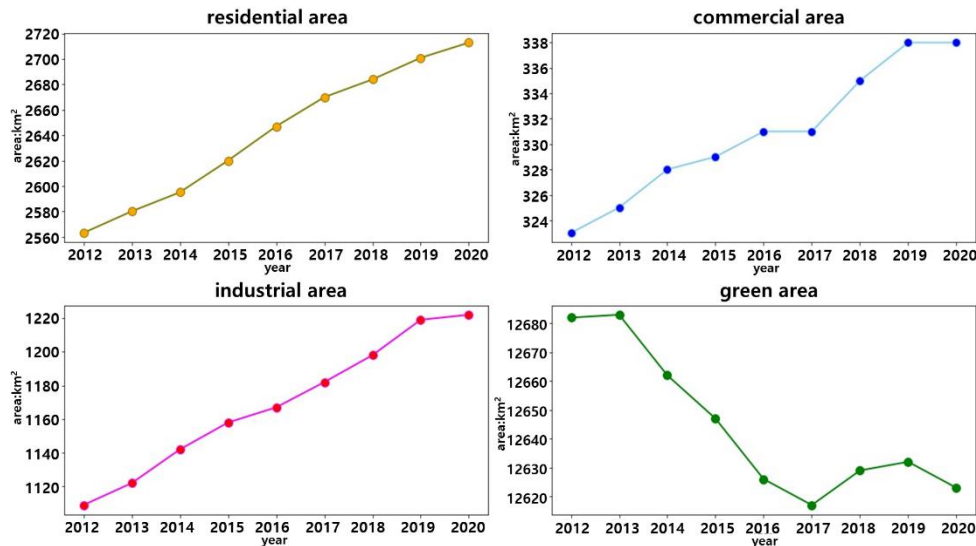
Green areas in downtown areas are becoming increasingly important as they provide citizens with many benefits such as alleviating urban heat island effect, securing water circulation function, improving landscape function, air quality purification function, and absorbing greenhouse gas.

**Table 1:** Scale review of urban management plans and environmental impact assessments in urban areas

	「National Land Planning Act」		「Environmental Impact Assessment Act」	
※In case of application of exceptions to area restrictions in 「Guidelines for operating permits for development activities」, permission for development activities is possible even if the area exceeds the standard area	<b>Urban management plan decision</b> -Residential/commercial/natural green space/production green area: 10,000 square meters or more -Industrial area: 30,000 square meters or more	↔	<b>Target for strategic and small-scale environmental impact assessment</b> (More than 60,000 square meters in urban area (10,000 square meters in green area))	※In the case of small-scale environmental impact assessment, only development projects according to the installation of sports facilities, aggregate collection projects, fishing port development projects, infrastructure installation/maintenance/improvement, and district unit plans in urban areas are covered.
	<b>development activity permit</b> -Residential, commercial, natural green space, production green area: less than 10,000 square meters -Industrial area: less than 30,000 square meters	↔	<b>Small-scale environmental impact assessment untargeted</b>	

Looking at the area distribution by special-purpose area within urban areas for the past 9 years, it can be seen that residential, commercial, and industrial areas continue to

increase year by year, but green areas continue to decrease.



**Figure 1:** Area increase/decrease by special-purpose area

On the other hand, small-scale development projects are subject to small-scale environmental impact assessment only for development projects determined by some individual laws and urban management plans, such as sports facility installation projects, aggregate collection projects, fishing port development projects, urban planning facilities

and projects according to district unit plans. Development projects conducted with a development activity permit are excluded from the small-scale environmental impact assessment.

According to the current National Land Planning Act,

buildings that can be built in conservation, production, and natural green areas are listed in a positive way (see Appendix 15-17 of the Enforcement Decree of the National Land Planning and Utilization Act).

If these buildings are less than a certain size, such as less than 10,000 square meters at natural green area and production green area, and less than 5,000 square meters for conservation management areas, they will be operated after deliberation by the city planning committee of the local government and permission for development activities.

If it is larger than a certain scale, it is included in the small-scale environmental impact assessment because it must be carried out as an urban planning facility or district unit plan.

However, if the exception is applied, it is possible to proceed with the permit for development activities, so even those larger than a certain size is excluded from the small-scale environmental impact assessment.

### **3.1.2. Exceptional Certification for Projects Subject to Strategic Environmental Impact Assessment in Urban Areas**

In urban areas, the target scale for designation of urban development zones is applied from 10,000 to 30,000 square meters. However, projects subject to strategic environmental impact assessment, such as designation of urban development zones, development plans, and rearrangement zone designation, are limited to those that are larger than the size of the projects subject to environmental impact assessment (250,000 & 300,000 square meters).

In addition, in the case of the designation of the reorganization promotion district and the reorganization promotion plan, the strategic environmental impact assessment target projects are limited to areas other than urban areas, so there is virtually no basis for implementing the strategic environmental impact assessment for urban areas.

### **3.1.3. A Rush of High-Rise Individual Buildings in Commercial and Semi-Residential Areas**

The floor area ratio applied to commercial areas is up to 1,500%, and the floor area ratio applied to semi-residential areas is up to 500%. During construction and operation of high-density individual buildings, various environmental impacts are expected due to the characteristics of urban areas, such as air quality deterioration, sunlight damage, noise and vibration damage, urban landscape and viewing rights impairment, urban heat island phenomenon deepening, and water circulation function suppression. Due to the implementation of projects outside of the

environmental impact assessment system, there are hardly any adequate reduction measures.

On the other hand, some local governments such as Seoul Metropolitan City, Gyeonggi-do (effective from January 1, 2020) and Busan Metropolitan City, through the Environmental Impact Assessment Ordinance, include cases of buildings with a total floor area of more than 100,000 square meters as projects subject to environmental impact assessment. However, this regulation only applies to the relevant municipality.

### **3.1.4. Established Individual Factory in Industrial Area**

Currently, industrial complexes and factories larger than a certain size are being implemented after consulting with environmental impact assessments. In case the business is changed, such as scale expansion or new pollutants are generated at this plant, the environmental impact is continuously reviewed through the implementation of environmental conservation plan review. When this plant is changed to an industrial zone, the environmental impact is reviewed through a strategic environmental impact assessment.

However, the environmental impact assessment has not been carried out for the industrial facilities installed before the introduction of the environmental impact assessment system and the new emission facilities on the land designated for use in the industrial area.

Therefore, in industrial areas located adjacent to residential and commercial areas, there is a high risk of adverse health effects such as air quality deterioration, noise damage, and odor damage to nearby residents and people living in the area due to the location of a business site that emits environmental pollutants.

In particular, in the case of air pollutants and stinks, it is possible to move over long distances and the range of damage is wide, and in the case of semi-industrial areas, some residential and commercial functions can be mixed and management is required.

## **3.2. System Improvement (draft)**

### **3.2.1. Expansion of Projects Subject to Strategic Environmental Impact Assessment**

#### **3.2.1.1. Amendment**

Since all exceptions to the implementation of strategic environmental impact assessment were deleted among the

**Table 2:** Current status of building-to-cover ratio and floor area ratio in urban areas

Area	special-purpose area	type	building-to-land ratio(%)	floor area ratio(%)
urban area	residential area	class I exclusive area	50	50-100
		class II exclusive area	50	100-150
		class I general area	60	100-200
		class II general area	60	150-250
		class III general area	50	200-300
		quasi-residential area	70	200-500
	commercial area	central commercial area	90	400~1,500
		general commercial area	80	300~1,300
		neighboring commercial area	70	200~900
		circulative commercial area	80	200~1,100
	industrial area	exclusive industrial area	70	150-300
		general industrial area	70	200-350
		quasi-industrial area	70	200-400
	green area	green conservation area	20	50-80
		green production area	20	50-100
green natural area		20	50-100	

contents of [Annex 2] of the 「Enforcement Decree of the Environmental Impact Assessment Act」, a revised plan was proposed to expand the target plan for the strategic environmental impact assessment in urban areas.

Looking at the specific contents, there are exceptions for the designation and development plan of urban development zones in cases where the size of the project subject to environmental impact assessment is larger than that of the project. However, projects subject to strategic environmental impact assessment are possible as long as the exceptions are deleted and more than 60,000 square meters in an urban area (more than 10,000 square meters in green areas).

In the case of designation of redevelopment promotion district and redevelopment promotion plan, exception provisions are set for areas other than urban areas, but the exception provisions are deleted and both urban areas and non-urban areas are targeted for strategic environmental impact assessment.

The designation of the maintenance area has an exception provision when the project scale is larger than the environmental impact assessment target, but the strategy is to remove the exception provision and if it is 60,000 square

meters or more in the urban area (green area is 10,000 square meters or more). It was classified as a project subject to environmental impact assessment.

**3.2.1.2. Reason for Revision**

Currently, only those projects that are subject to environmental impact assessment, such as designation and development of urban development zones of 250,000 square meters or more, and designation of maintenance zones of 300,000 square meters or more, are subject to strategic environmental impact assessment. The designation of the reorganization promotion district and the reorganization promotion plan fall under the strategic environmental impact assessment target only in the case of areas other than urban areas.

Therefore, by removing the exceptions from the current enforcement ordinance, the development plan for urban areas of 60,000 square meters (10,000 square meters for green areas) or more is expanded to the target of strategic environmental impact assessment to protect citizens' environmental rights and improve amenities.

**3.2.2. Expansion of Projects Subject to Environmental Impact Assessment**

**3.2.2.1. Amendment**

The hierarchy with the area subject to environmental impact assessment (100,000 square meters) according to the

current local government ordinance was considered. A new standard for building floor area was introduced, but a proposal to improve it as a project subject to national environmental impact assessment when building buildings of 200,000 square meters or more was proposed.

During that time, the scale of the project subject to environmental impact assessment was set based on the site area and facility capacity of the project site. However, the environmental impact of high-rise buildings will be examined in urban areas by adding a building area standard.

### **3.2.2.2. Reason for Revision**

A national environmental impact assessment for buildings is not currently being conducted.

The necessity of establishing appropriate alternatives and reduction measures by evaluating the problem of lack of infrastructure due to high-density development in downtown areas, the living environment (noise, sunlight, light pollution, air pollution, etc.) absolutely necessary.

Therefore, we proposed a plan to improve the system so that the national environmental impact assessment will be carried out for facilities of a scale (200% or more) larger than targeted for environmental impact assessment of buildings stipulated by the local government ordinance.

### **3.2.3. Expansion of Subject to Small-Scale Environmental Impact Assessment**

#### **3.2.3.1. Amendment**

Various problems have been derived from the reduction of small-scale environmental impact assessments in urban areas as described above. A proposal to improve the minimum small-scale environmental impact assessment target in urban areas to more than 60,000 square meters (however, 10,000 square meters for green areas and 30,000 square meters for industrial areas) regardless of the type of project was proposed.

In addition, currently small-scale environmental impact assessment projects in urban areas include sports facility installation projects, aggregate collection projects, fishing port facility development projects, urban planning facility installation projects, and implementation projects according to district unit plans.

However, a proposal was proposed to delete all of these exceptions, and to improve all small-scale environmental impact assessment targets if the area is larger than the above area.

#### **3.2.3.2. Reason for Revision**

Currently, small-scale environmental impact assessment

projects are focused on non-urban areas.

In particular, in the case of urban areas, sports facility installation projects, aggregate collection projects, fishing port development projects, urban planning facilities installation, and district unit plans are being implemented only for some development projects.

Therefore, it was proposed to delete the above-mentioned small-scale environmental impact assessment target development projects in urban areas and expand all development projects to small-scale environmental impact assessment target projects if the scale is above a certain level.

### **3.2.4. Additional Reviews**

#### **3.2.4.1. Expanding Self-Reviews of Approval Bodies**

Among projects that are not subject to environmental impact assessment in urban areas, over a certain size (site area, gross floor area, pollutant emissions), it is necessary to expand the self-review project of the approval agency without consultation with the Ministry of Environment. At the same time, the “Enforcement Decree of the Environmental Impact Assessment Act” should be amended to ensure nationwide implementation.

#### **3.2.4.2. Reestablishment of Evaluation Items and Techniques for Urban Environmental Impact Assessment**

For development projects implemented in non-urban areas, the evaluation of the natural environment is being dealt with in depth. However, it is considered that development projects in urban areas should be treated with more weight in the evaluation of the living environment in consideration of the impact on public health. In addition, it is necessary to develop evaluation items and techniques suitable for regional characteristics such as urban heat island phenomenon, water circulation, and use of eco-friendly energy due to the characteristics of urban areas.

## **4. Conclusions**

This study was carried out to maximize the net function of this system by incorporating development projects in urban areas directly related to public health into the environmental impact assessment system. In order to reorganize the legal system, it is judged that the problems caused by the implementation of the system improvement plan that go against the deregulation and the additional review should be thoroughly reviewed and supplemented before proceeding.

**Table 3:** Added items of small-scale environmental impact assessment for urban areas (draft)

Current enforcement	Evaluation additional items (contents)
1. project overview and local environmental conditions 1.1. project summary 1.2. Area overview 1.3. Natural ecological environment 1.4. Living environment 1.5. Social / economic environment 2. Environmental impact prediction / evaluation and environmental conservation measures 2.1. Natural ecological environment (animals and plants, etc.) 2.2. Air quality, odor 2.3. Water quality (indicator, underground), marine environment 2.4. Land use, soil, topography / geology 2.5. Environmentally friendly resource circulation, noise and vibration 2.6. Landscape 2.7. Radio interference, sunshine interference 2.8. Population, housing, industry	<ul style="list-style-type: none"> <li>○Natural ecological environment (animal and plant image): Focus on securing ecological area ratio, natural ground green area ratio and biotop composition by development project from the current situation survey</li> <li>○Addition of greenhouse gases: Expanded to eco-friendly building certification, ensuring energy efficiency grades, and using new renewable energy building energy</li> <li>○Water quality: Installation and operation of rainwater infiltration facility, recycling plan for spilled groundwater, etc.</li> <li>○Topography and geology: Review of stability of surrounding facilities by underground excavation</li> <li>○Noise: It is necessary to study noise standards for <b>night time</b> noise considering the characteristics of the city (solving problems by installing excessive noise barriers).</li> <li>○Sunlight obstacle: Considering the characteristics of the city area, research by reduction plan is required</li> <li>○Light pollution: Examination of effects such as sleep disorders due to excessive introduction of lighting at night</li> </ul>

Through this research, exceptions limited to non-urban areas and cases subject to environmental impact assessment were deleted from the strategic environmental impact assessment target plan. Buildings with a total floor area of 200,000 square meters or more are newly included as projects subject to environmental impact assessment, and small-scale environmental impact assessment targets have

been removed from the exceptions for targeted projects in urban areas and are larger than 60,000 square meters in urban areas (however, 10,000 square meters in green areas), the industrial area is 30,000 square meters), and it contains the contents of expanding and improving the evaluation target.

**Table 4:** Target improvement such as urban area environmental impact assessment

contents	current	improvement plan
Strategic Environmental Impact Assessment	·There are exceptions for urban areas and projects subject to environmental impact assessment.	·Removal of exception clause
Environmental Impact Assessment	·No evaluation criteria for buildings	·Newly established for environmental impact assessment with a total area of 200,000 square meters or more
Small-scale environmental impact assessment	·There are exceptions for physical education facility installation project, aggregate collection project, fishing port facility development project, city planning facility installation project, and implementation project based on the global unit plan, with more than 60,000 square meters in the urban area (10,000 square meters for green area).	·Regardless of the type of project, if it is 60,000 square meters or more (however, 10,000 square meters for green areas and 30,000 square meters for industrial areas), it will be improved.

In the meantime, the environmental impact assessment system has confirmed some policy effects, such as preventing various environmental problems caused by domestic industrialization and urbanization in advance and acting as a window for collecting opinions from local

residents. On the other hand, considering that this system also has the stigma that it is a system that grants indulgences for development projects, it is necessary to continuously review the problems of the system and make an effort to come up with an improvement plan.

It is expected that the results of this study will be provided as basic data that can be actively used by local governments, environmental evaluation consultative organizations, and urban development organizations, enabling a scientific and quantitative review of environmental impacts on urban development plans. Ultimately, it is hoped that it will lead to sustainable development and conservation of urban areas.

Environment  
Seoul City Environmental Impact Assessment Ordinance  
[Enforcement 2022. 4. 28.] [Seoul City Ordinance]  
Strategic Environmental Impact Assessment project Manual,  
December 2017, Ministry of the Environment  
Won, J. M.(2003). Urban Planning : Infrastructure-Oriented, 111-  
129

## **5. Research Limitations and Future Research Directions**

In this study, exceptions and environmental impact assessment targets limited to non-urban areas should be included later in the strategic environmental impact assessment target plan. In addition, buildings with a total floor area of more than 200,000 m<sup>2</sup> are newly established as environmental impact assessment projects, and small-scale environmental impact assessments should be included in the exclusion of urban area projects.

## **References**

- Busan City Environmental Impact Assessment Ordinance [Enforcement 2021. 7. 7.] [Busan City Ordinance No. 6410]  
City / Army Basic Plan Establishment Guidelines [Enforcement 2021.12.30.] [Ministry of Land, Infrastructure and Transport Instruction No. 1470]  
Development activity permission management guideline [Enforcement 2021. 3. 31.] [Ministry of Land, Infrastructure, Transport and Tourism Instruction No. 1375]  
Environmental Impact Assessment Act [Enforcement 2021. 8. 17.] [Law No. 18432]  
Environmental Impact Assessment Act Enforcement Decree [Enforcement 2022.1.1.] [Presidential Ordinance No. 32251]  
Gyeonggi-do Environmental Impact Assessment Ordinance [Enforcement 2021.5.4.] [Gyeonggi-do Ordinance No. 6974]  
Korea Planners' Association(2004). Land Use Planning, 346-384  
Korea Planners' Association(2004). Urban Planning, 625-645  
Korea Planners' Association(2012). National&Regional Planning, 391-419  
Law Concerning National Land Planning and Use [Enforcement 2022.1.13.] [Law No. 17893]  
Law Enforcement Decree on National Land Planning and Utilization [Enforcement 2022.2.18.] [Presidential Decree No. 32447]  
Regulations for processing discussions regarding environmental impact assessments [Enforcement 2021.11.30.] [Ministry of the Environment Preliminary Regulation No. 696]  
Regulations on preparation of environmental impact assessment, etc. [Enforcement 2022.3.1.] [Environment Department Notification No. 2021-300]  
Regulations on preparation of environmental impact assessment, etc., Notification No. 2021-300 of the Ministry of the