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A Study on the Preparation of Distribution Table for Quantitative Evaluation of Small-Scale Environmental Impact Assessment

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Abstract

Purpose: The small-scale environmental impact assessment has been in operation since its implementation in August 2000, and is a system that meets the purpose of sustainable development in consideration of the environment in areas requiring conservation. However, when preparing a small environmental impact assessment report, the contents of the reduction measures are too qualitative, or reports are prepared to simply list the compliance stipulated by individual laws, and the contents of consultations prepared by consultative agencies and review agencies are not much different. In addition, the direction of consultation on development projects for similar locations of the same project type is frequently changed by reflecting the subjective judgment of the consultative officer of the Ministry of Environment (Environment Agency). Therefore, this study attempted to improve the establishment of measures to reduce the existing simple listing of qualitative contents and the inconsistent presentation of review opinions by consultative agencies and review agencies. **Research design, data and methodology:** The research method extracted absolute evaluation items and relative evaluation items among small environmental impact assessment items, analyzed and presented detailed items, and prepared a distribution table for each section according to the details of the relative evaluation items, and presented them as a table. **Results:** This study was conducted to derive uniform results with objective indicators in the preparation and consultation process of a small-scale environmental impact assessment. **Conclusions:** Once a quantitative evaluation is established, the consultant can objectively determine and process the environmental impact.

Keywords : Small scale environmental impact assessment, Absolute assessment items, Relative assessment items, Quantitative assessment

JEL Classification Codes : I30, I31, I38

1. Introduction

Since the small-scale environmental impact assessment system was first implemented in August 2000 as a preliminary environmental review, it has been operated until

now with only a different name as a small-scale environmental impact assessment in 2012.

In the early stages of implementation, an in-depth review was not conducted due to the lack of proficiency of the authors and reviewers of the evaluation document, but now

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in-depth evaluation is being conducted, with relatively various factors considered.

However, the accumulation of these evaluation data contributes not only to positive factors but also to some negative factors.

For example, when preparing a small environmental impact assessment report, the contents of reduction measures are very similar in qualitative content, or reports are prepared at a level that simply lists the compliance stipulated in individual laws by media.

In addition, the direction of discussion on development projects for similar locations of the same business type frequently varies, reflecting the subjective judgments of the Ministry of Environment (Environment Agency) and reviewers such as the Korea Institute of Environmental Research, National Institute of Environment.

Therefore, this study attempted to improve the establishment of measures to reduce the existing simple listing of qualitative contents and the inconsistent presentation of review opinions by consultative agencies and review agencies.

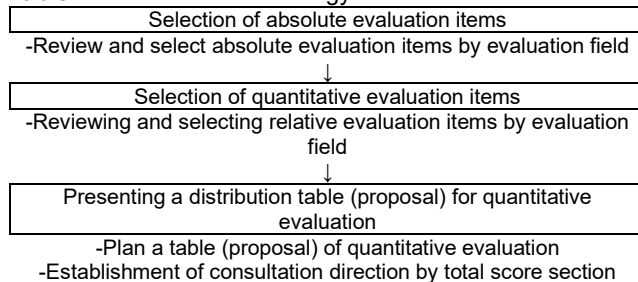
2. Research Methodology

First, the research method extracts items that can be absolutely evaluated among small-scale environmental impact assessment items, analyzes and presents detailed items.

Second, relative evaluation items excluding absolute evaluation items among small-scale environmental impact evaluation items are extracted, and detailed items are analyzed and presented.

Third, according to the details of the relative evaluation items, a distribution table for each section is prepared and presented as a table.

Table 1: Research Methodology



3. Research Results

3.1. Selection of Absolute Evaluation Items

In the case of items with high conservation value for each evaluation item or items that cannot be recovered in the event of damage, and long-term recovery is inevitable, it is necessary to select them as absolute evaluation items.

Therefore, the location of development projects in the area is fundamentally limited or reduced.

Areas that need to be set as absolute evaluation items include animals and plants, topography and geology, and water quality items.

In Korea, areas that need protection are concentrated around Baekdudaegan Mountain Range and veins, and the topography of the east, west, and west, and geographical features surrounded by the sea on three sides.

The results of overlapping this through the GIS program are as shown in Figure 1. The status of protected areas.

Table 2: Selection of Absolute Evaluation Items

Sortation	Absolute evaluation item	Note
fauna and flora	-The ratio of ecological and natural grade I Area -Areas with vegetation conservation grade 2 or higher -Natural monuments, endangered wildlife and plant habitats -Wetland Protected Areas -Forest Genetic Resource Reserve -Wildlife Sanctuary, Wildlife Sanctuary -Ecological Landscape Conservation Area	
topography and geology	-Baekdudaegan Mountain Range Protected Area and Key Area of Veins (within 150m) -Topography and geology with high conservation value	
water quality	-Waterfront area -Water supply reserve -Water Resources cultivation Reserve	

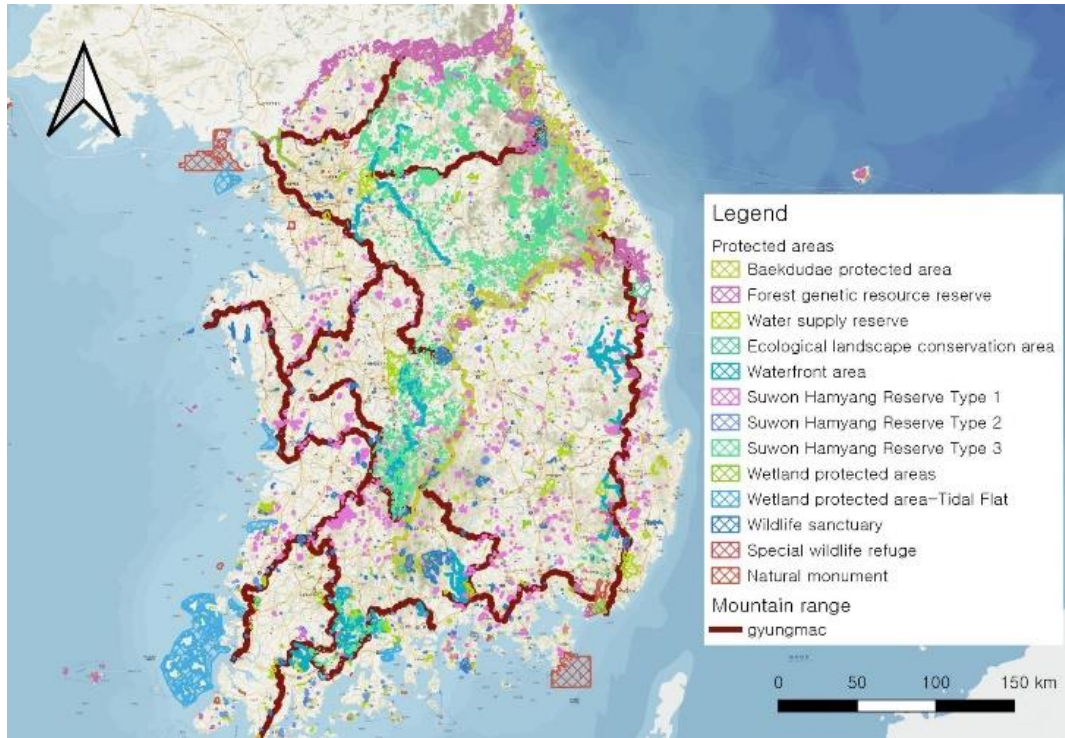


Figure 1: Status of protected areas

3.2. Selection of Relative Evaluation Items

Items other than absolute evaluation items are set as relative evaluation items, and distribution points are applied differentially in consideration of the degree of protection and the reduction rate below the emission allowance standard.

In particular, when considering the regional characteristics or type of project for each evaluation item, a device is prepared to increase or decrease the distribution point by adding weight to the key items.

For example, if a project plan is established by raising the reduction rate below the emission allowance standard by taking sufficient measures to reduce water quality in a special water source water quality conservation area, there is a plan to give incentives to operators.

Table 3: Selection of relative evaluation items

Sortation	Relative evaluation items	Note
fauna and flora	-The ratio of ecological and natural grade II Area -The ratio of vegetation conservation grade 3 to area incorporation -Ratio of Wetland Management Area and Wetland Improvement Area -Absolute evaluation item setting Distance from protected area -Transplantation rate of damaged trees	Excluded from calculating incorporation ratio when establishing circular preservation green areas
topography and geology	-Maximum Shredding and Stacking Slope -The ratio of the area of the artificial slope (mounting wall) to the area of the generated slope -Topographic change index -Absolute evaluation item setting Distance from protected area	
air quality	-Ratio below emission allowance standard (operating)	
water quality	-Ratio below emission allowance standard (operating)	
Noise and vibration	-Ratio below emission allowance standard (operating)	

3.3. Presenting a Distribution Table (proposal) for Quantitative Evaluation

For quantitative evaluation, points were assigned to each evaluation item by differentiating the incorporation ratio of protected areas such as ecology and natural islands, the

distance from these areas, and the ratio below the emission acceptance standard from 0 to 1.0 points.

If the total score is 12 points, which is more than 9.6 points, which is 80% or more, there will be differential consultations such as original consultation, conditional consultation if you secure more than 7.2 points, and supplement or return if it is less than 60%.

Table 4: Distribution Table for Quantitative Evaluation (draft)

Sortation	Relative evaluation items	Section	Score
fauna and flora	The ratio of ecological and natural grade I II Area	100%More than	0
		75%More than ~100%Less than	0.2
		50%More than ~75%Less than	0.5
		25%More than ~50%Less than	0.7
		25%Less than	1.0
	The ratio of vegetation conservation grade 3 to area incorporation	100%More than	0
		75%More than ~100%Less than	0.2
		50%More than ~75%Less than	0.5
		25%More than ~50%Less than	0.7
		25%Less than	1.0
	Ratio of Wetland Management Area and Wetland Improvement Area	100%More than	0
		75%More than ~100%Less than	0.2
		50%More than ~75%Less than	0.5
		25%More than ~50%Less than	0.7
		25%Less than	1.0
	Absolute evaluation item setting Distance from protected area	50mLess than	0
		50mMore than ~100mLess than	0.2
		100mMore than ~200mLess than	0.5
		200mMore than ~300mLess than	0.7
		300mMore than	1.0
Transplantation rate of damaged trees	5%Less than	0	
	10%More than ~15%Less than	0.2	
	15%More than ~20%Less than	0.5	
	20%More than ~25%Less than	0.7	
	25%More than	1.0	
topography and geology	Maximum Shredding and Stacking Slope	12mMore than	0
		10mMore than	0.2

		~12mLess than	
		8mMore than ~10mLess than	0.5
		6mMore than ~8mLess than	0.7
		6mLess than	1.0
	The ratio of the area of the artificial slope (mounting wall) to the area of the generated slope	100%More than	0
		75%More than ~100%Less than	0.2
		50%More than ~75%Less than	0.5
		25%More than ~50%Less than	0.7
		25%Less than	1.0
	Topographic change index	7More than	0
		5More than~7Less than	0.2
		3More than~5Less than	0.5
		1More than~3Less than	0.7
		1Less than	1.0
	Absolute evaluation item setting Distance from protected area	50mLess than	0
50mMore than ~100mLess than		0.2	
100mMore than ~200mLess than		0.5	
200mMore than ~300mLess than		0.7	
300mMore than		1.0	
air quality	Ratio below emission allowance standard (operating) *Restriction of major emission pollutants	100%	0
		75%More than ~100%Less than	0.2
		50%More than ~75%Less than	0.5
		25%More than ~50%Less than	0.7
		25%Less than	1.0
water quality	Ratio below emission allowance standard (operating) *Restriction of major emission pollutants	100%	0
		75%More than ~100%Less than	0.2
		50%More than ~75%Less than	0.5
		25%More than ~50%Less than	0.7
		25%Less than	1.0
Noise and vibration	Ratio below emission allowance standard (operating) *Applies to noise only	100%	0
		90%More than ~100%Less than	0.2
		80%More than ~90%Less than	0.5
		70%More than ~80%Less than	0.7
		70%Less than	1.0
a Total score			12.0

3.4. Further Research Plan for the Future

Based on the quantitative evaluation distribution table (draft) presented above, follow-up research is needed on incentives such as distributing points when requesting consultations on small environmental impact assessments and notifying consultation opinions by shortening the period.

Through such incentives, it is expected that investment in environmental costs and the introduction of new technologies to preserve the environment will be actively carried out in the business plan.

4. Conclusions

This study was conducted to derive uniform results with objective indicators in the process of preparing and consulting a small-scale environmental impact assessment.

Until now, qualitative and simple reduction measures have been established in the process of preparing the evaluation, and the consultative and review agencies have provided opinions using subjective judgments and internal guidelines with ambiguous standards.

The distribution table (proposal) for quantitative evaluation presented in this study is the result of resolving these distrust factors and deriving transparent and fair results.

In addition, once quantitative evaluation is established, the consultative authority can objectively judge and process the original plan consultation, conditional consultation, supplementation, and return measures through the distribution table calculated by numbers,

Businesses and evaluation agencies are expected to have positive effects, such as investing in the environmental sector and making efforts to apply new technologies related to reducing environmental impact to shorten the time until the original consultation or consultation is completed.

Through further research in the future, we would like to apply it to actual cases of small-scale environmental impact assessment for each type of project, and through the results, we would like to find out what positive or negative effects there are on the consulting entity, the approval authority, and the consulting authority.

References

- MOE (2021). Wetland Conservation Act(Act No. 17844), Article 8: "Designation of Wetland Areas, etc."
- MOE (2022). Water Environment Conservation Act(Act No. 18469), Appended Table 13: "Standards for Permission of Discharge of Water Pollutants".
- MOE (2023). Air Environment Act(Act No. 19125), Appended Table 8: "Standards for Emissions of Air Pollutants".
- MOE (2023). Natural Environment Conservation Act(Act No. 19012), Article 34: "Preparation and Utilization of Ecology and Natural Year"
- MOE (2023). Noise and Vibration Control Act(Act No. 19468), Appended Table 8: "Regulatory Standards for Living Noise and Vibration".
- MOE (2023). Regulations on preparation of environmental impact assessment reports, etc., Notice No. 2023-72.
- MOE (2023). Strategic Environmental Impact Assessment Work Manual, 11-1480000-001466-14.