

# Korea Environmental Policy Bulletin

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## Environmental Impact Assessment in Korea

### I. Introduction

In the latter half of the 20th century, rapid industrialization and population growth aggravated environmental problems such as the depletion of resources, global warming, and destruction of the natural environment, giving rise to concerns about the loss of nature's self-purification capacity. However, conventional responses were limited to the regional level, in addition to being both passive and fragmented, and thus insufficient to tackle increasingly complex and diverse environmental problems. More proactive environmental management policies that could address environmental problems in an organized, comprehensive and preventative manner were called for.

Accordingly, the Environmental Impact Assessment (EIA) was adopted as part of the preventative efforts to create harmony between development and conservation and to consider the environmental effects of development activities in advance. Since the introduction of the U.S. National Environmental Policy Act (NEPA) of 1969, the EIA has spread worldwide. Presently, it has been adopted and implemented by about 110 countries. It is also highly recommended by international organizations as an effective environmental policy tool.<sup>1 2</sup>

Since the OECD Declaration on Environmental Policy of 1974, OECD has recommended EIA as an important policy measure for attaining sustainable development and emphasized the importance of adopting the EIA for various development projects and development aid

<sup>1</sup> Sang-wook Han, Review of Environmental Impact Assessment, Asia Pacific Environment & Management Institute, 2002  
<sup>2</sup> Yeon-man Jeong, A Study on Establishing an Environmental Impact Assessment Law System, Doctoral dissertation, Dong-A University, 2000

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programs. In accordance with the global environmental conservation philosophy of “environmentally sound and sustainable development (ESSD)”, the United Nations Environment Programme (UNEP) stipulated the “objectives and principles of EIA” in 1987. In addition, an Action Programme on conducting EIA at international, regional and national levels was established. Principle 17 of the Rio Declaration on Environment and Development, adopted at the Earth Summit in Rio de Janeiro in 1992, states that “Environmental Impact Assessment, as a national instrument, shall be undertaken for proposed activities that are likely to have a significant adverse impact on the environment and are subject to a decision of a competent national authority”.

Korea adopted the EIA system, which was then titled “prior consultations”, in 1977 with the enactment of the Environmental Conservation Act. It was then introduced in full scale in 1981 when the “Regulations on Preparing the EIA Report” were legislated. Over the past 25 years since being introduced, EIA has served as an effective program for protecting the environment while inciting awareness of environment-friendly development to development executors (institutions) as well as promoting the importance of environmental conservation to the public. However, apart from such achievements, EIA in Korea has come under criticism for becoming a measure to further validate development activities rather than a measure for environment conservation due to the systematic and operational problems.

This paper seeks to review the achievements and issues of EIA as practiced in Korea and to discuss directions for making improvements to the system.

II. Overview of the Environmental Impact Assessment System

2.1 Objective

The Environment Impact Assessment system in Korea has been perceived as a key element in upholding the principle of prior considerations, a guiding principle in environment law. In other words, while the EIA recognizes the necessity of development, it reviews the impact of a development project on the environment in advance and provides guidance in establishing a development plan that minimizes negative impact on the environment. It is recognized as an environmental management measure that enables sustainable development by harmonizing development and conservation.<sup>3</sup>

The Environmental Impact Assessment system in Korea played a crucial role in shifting policy making from the past model that focused on project efficiency and economics. The objective of EIA is to promote environmentally sound and sustainable development. Also, it aims to maintain and create a healthy environment by identifying objective measures for win-win solutions as well as blocking and preventing possible environmental destruction and pollution associated with various development programs.

2.2 Evolution of the Environmental Impact Assessment System<sup>4</sup>

1) Introduction Period (1977~1981)

In the 1970s, Korea began to recognize the side effects of growth-oriented national policies, gradually raising the need for balanced development and measures against environmental pollution. Accordingly, the nature of the Pollution Prevention Act shifted from being a public hygiene law to an anti-pollution law in 1971. Article 2 (Applications for Permit for the Construction of Emission Facilities) of the Pollution Prevention Act Enforcement Decree, as revised in 1974, requires the submission of relevant documents when applying for a permit to build facilities that emit pollutants. This may be interpreted as requiring a sort of EIA report. In 1977, the Environmental

Conservation Act was enacted and the basis for the introduction of environment impact assessments was provided in Article 5 of the Act. However, regulations were unclear and the EIA was not precisely defined in Korea.

It was only in the 1980s, when the Environment Administration was established as an administrative authority of the central government and the Regulation on the Drafting of Environmental Impact Assessment Statement were enacted and promulgated, that the EIA system was finally launched. In the 1981 amendment of the Environmental Conservation Act, the scope of evaluators was expanded to include the heads of public organizations and government-invested organizations as well as administrative authorities. Project types subject to EIA were extended to ten categories by adding railway construction, airport construction, land reclamation and development of apartment districts. In addition, EIA became more concrete in the Regulation on the Drafting of Environmental Impact Assessment Statement in 1981 when the assessment areas were defined to cover 19 items in 3 areas.

2) Transition Period (1981~1990)

As industrial and urban development projects were expedited in the 1980s, environmental pollution became aggravated and the damages began to surface. Environment problems were no longer an issue of pollution that affect public health in a narrow sense. It emerged as a critical issue regarding the quality of life. In addition, as the private sector began to lead large-scale development projects, the 1986 amendment of the Environmental Conservation Act expanded the project types subject to the Strategic Environmental Assessment (SEA) to eleven categories by adding tourism complexes. In particular, it became possible to adjust and refine project plans according to the outcome of EIA statement reviews. The heads of the authorities that license, permit or approve projects were requested to incorporate the outcome of EIA consultation to relevant project plans. Unless there were exceptional reasons, they were required to take actions necessary to reflect the

outcomes of such consultation to relevant projects.

In the 1990s, with the national income on the rise and growing interest in improved quality of life, the public began to steadily place emphasis on the importance of a comfortable environment. In order to meet such demands, a complete overhaul of environment-related statutes was required to have consistency through laying down the long-term vision of environmental policies, enhancing coordination between environment-related laws, and raising the effectiveness of EIA.

Accordingly, in 1990, the Environment Administration was elevated to the Ministry of the Environment. In the process of abolishing the Environmental Conservation Act and enacting the Framework Act on Environmental Policy, a separate law mainly governing the philosophy and direction of environmental policies, EIA was transferred to the Framework Act on Environmental Policy and significant rules concerning EIA were added and reinforced. Above all, the types of projects subject to the EIA had increased from 32 project types in 11 areas to 47 project types in 15 areas. Also, it became required to draft a final assessment statement, which reflects the opinions of local residents on a preliminary assessment statement. In addition, a system such as an internal investigation and validation of assessment consultation was introduced. Post management systems such as raising objections to the assessment consultation, re-consultation on revised project plans and monitoring of compliance to the contents of consultation were introduced to assure effective implementation of the assessment consultation. In August 1992, the Enforcement Decree of the Framework Act on Environmental Policy was amended and the EIA on development projects initiated at the local level was delegated to the Provincial Environment Administration to facilitate locally-based environmental review.

3) Implementation Period (1990~1999)

In the 1990s, environmental policy surfaced as a key agenda item of national administration. Efforts toward fundamentally resolving environmental

<sup>3</sup> Yeon-man Jeong, Ibid, 2)  
<sup>4</sup> Jun-gyu Choi, (KEI internal data) Review of Environment Impact Assessment, 2003

problems also became visible over time. On the international front, the emergence of a new paradigm called sustainable development urged that environmental considerations be taken when deciding the overall direction of national policies.

Enhanced awareness of the government and public on the importance of the environment brought about substantial changes in the EIA system and its operation. As an effort to improve and address challenging legislative technicalities in defining specific and enforcement-related matters such as the scope of projects, timing and consultation procedures of the EIA under the Framework Act on Environmental Policy, which sets the basic direction of the environment policy, and to deal with other issues revealed in its operation and raise its operational efficiency, the Environmental Impact Assessment Act was enacted in June 1993 as an independent law and placed into force in December of the same year.

In the EIA Act, existing laws and institutional systems were revised and refined, including the revision of procedures and enhancement of post management systems. The Regulation on the Drafting of Environmental Impact Assessment Statement and the details of Review and Consultation of the EIA Statement were amended three times. A presentation or a public hearing to collect the true opinion of local residents became compulsory. Meanwhile, a project approval authority was put in charge of requesting an assessment statement consultation and follow-up measures. In addition, in order to assure the complete execution of consultation details, it became obligatory to keep a registry of managing consultation details and designate a manager for this function. If a project executor, who had been ordered to discontinue construction because of a failure to comply with consultation details, is caught violating the same order again, he/she would be punished with criminal charges. Also, since introducing the local autonomy system, from the perspective of enhancing the autonomous local environment management function of local governments, they were allowed to conduct EIA autonomously on small-scale projects in accordance with municipal and provincial ordinances while considering features unique to the local area. Furthermore, a number

of regulations were newly legislated: the inspection and verification of compliance with EIA consultation details, drafting of an integrated assessment statement on a comprehensive plan comprised of multiple projects subject to the EIA as well as a consultation affairs guideline, a business guideline on managing EIA consultation details, and administrative rules on charges levied for not meeting consultation standards.

In particular, in order to review the EIA statement in a structured and specialized manner, the Korea Environment Institute, an institution specializing in the review of EIA statements, was established with the second amendment of the Environment Impact Assessment Act in the latter part of 1997 and empowered with the responsibility of reviewing assessment statements.

**4) Enhancement Period (1999~present)**

In the 21st century, a variety of environmental policy programs and systems have been developed and established. Effort to pursue both development and environmental conservation by integrating national land development plans and environmental plans are taking place through, for one example, the establishment of the Construction and Environment Division in the Ministry of Construction and Transportation.

Such a trend is also evident in the EIA, which has been both praised as an environmental safeguard and criticized as an indulgence. As EIA lapsed into an environmental restriction regime, limitations of its preventive functions were perceived. In 1999, the Basic Environmental Policy Act newly legislated a regulation that made the Prior Environmental Performance Review System (PEPRS) compulsory. Under PEPRS, the validity of a site and its harmony with the surrounding environment were reviewed in the cases of high-level master plans that were de facto excluded from or neglected by EIA. With this amendment, the Basic Environmental Policy Act Enforcement Decree added the following to the list of projects subject to PEPRS: designation of an agro-industrial complex, which did not have a legal basis for prior consultation in relevant laws; ten administration plans including development plans for hot springs; and

<Table 1> Regulatory development of the Environmental Impact Assessment Act

	Law	Year	Contents and amendment	Project type	Public Participation	Review EIS	
Intro- ction Period	Environ- mental Conser- vation Act	1977	Prior Consultation, Preparation of EIS	3 Areas		Minister of Health and Social Affairs	
		1979		6 Areas		Administrator of the Office of Environment	
		1980	EIA and Consultation, Preparation of EIS, Procedure of Consultation	10 Areas			
		1981					
		1981	Appointment of Agency				
		1982					
Transiti- on Period			1983	Scope of Relevant Project, Period of Consultation Request	11 Areas 30 Unit Projects		
			1986	Preparation of EIS, Review of EIS & Opinion Submission, Agency of EIA , Notification of Consultation Result	11 Areas 30 Unit Projects		Administrator of the Office of Environment, Subdivision Committee of EIA
	Framework Act on Environ- mental Policy	1990	Preparation of EIS, Review of EIS, Monitoring and Follow- up, Delegation of Authority	15 Areas 47 Unit Projects	Introduction of Public Opinion Survey System, Public Display of Draft EIS (20 days)	Minister of Environment, Subdivision Committee of EIA	
		1991			Introduction of Public Opinion Survey System, Public Display of Draft EIS (20 days)		
	Implem- enta- tion Period	Environ- mental Assessment Act	1993	Projects subject to EIA, Preparation of EIS, Consultation of EIS, Management of Consultation Contents, Environmental Impact Reassessment, Korea Environment Institute	16 Areas 59 Unit Projects	Public Display of Draft EIS (30 days), Explanatory hearing or Public Hearing	Minister of Environment, Korea Environment Institute, Expert Recommended by Public
1995			17 Areas 62 Unit Projects				
			1997	17 Areas 63 Unit Projects	Public Display of Draft EIS (30-50 days)	Minister of Environment, Korea Environment Institute, Expert Recommended by Public	
Enhanc- ement Period	Framework Act on Environ- mental Policy	1999	Projects subject to EIA, Criteria, Methods, and Consultation Period of Preliminary Environment Review	Administra- tion Plan and Development Project		Minister of Environment, Korea Environment Institute, Expert Recommended by Public	
	Act on Assessment of Impacts of Works on Environment, Traffic, Disasters, etc.	1999	General provisions, Preparation of EIS, Consultation of EIS, Special Provisions relating to EIA	Projects subject to Environmental Impact Assessment, Population Impact Assess- ment, Traffic Impact Assessment	Public Display of Draft EIS (30-50 days)	Korea Environment Institute, Local and Central Transportation Committee, Seoul Metropolitan Readjustment Committee, Disaster Impact Assessment Committee	



development projects led by the private sector in preservation zones, which was excluded from the Prime Minister decree.

Introduction of PEPRS will serve as a mechanism for effectively supplementing the EIA at the planning stage as it considers environmental impacts, such as site validity and harmony with the surrounding environment, at the initial planning stages in various development plans or programs.

In 1999, the Act on Assessment of Impacts of Works on Environment, Traffic, Disasters, etc. was enacted to integrate impact assessments on the population, transportation and disasters. In addition to the environmental impact assessment, individual forecasting and analysis of negative impacts of various development projects depending on project characteristics and its location are being conducted. Accordingly, in order to address the problems that may arise by integrating impact assessments, such as weakened expertise, and to improve the quality of the EIA, the Act on Assessment of Impacts of Works on Environment, Traffic, Disasters, etc. adjusted the scope of projects subject to assessment, developed a manual on how to draft an integrated assessment statement and unified the assessment statement review functions concerning the procedures of consultation and review of EIA statements. Nonetheless, some regulatory, policy and operational issues are still pending and need to be resolved in the course of implementation.

2.3 Projects subject to EIA

As for projects subject to the EIA, unlike NEPA, which defines comprehensively instead of

enumerating the specific types of projects, Korea maintains a positive list in principle. According to Article 4 of the Impact Assessment Act on Environment, Transportation and Natural Disasters and Article 2 of its Enforcement Decree, a development executor seeking to initiate a project subject to the EIA is required to draft an assessment statement and submit such to the head of an approval authority. Then, the head of the approval authority consults with the Ministry of the Environment. As shown in <Table 2>, projects subject to the EIA are defined as 63 project types in a total of 17 areas. The projects are mostly large projects that are likely to have significant impact on the environment.

2.4 Assessment items

The categories and items of the EIA are stipulated in the assessment statement section of the Article 5 of the EIA Act on Environment, Transportation and Natural Disaster and Article 4 of its Enforcement Decree. In addition, the Regulations on the Preparation of EIA Reports of the Ministry of the Environment define key assessment items by project type and key assessment components of each assessment item. The focused assessment items include: 1) key assessment items stipulated by laws and regulations; 2) assessment items that were requested for focused assessment on reasonable grounds by relevant administrative organizations and local residents when their opinions on a preliminary assessment statement were collected; and 3) assessment items that are judged by a development executor to have significant impact on the environment considering the features unique to a project. The current EIA categories

<Table 2> Type and size of projects subject to EIA<sup>5</sup>

Group	Type and Size of Projects
Urban Development (10)	- Urban Planning, Land Organization, Housing Development, Urban Renewal, School: 300,000 ㎡ - Distribution Complex, Passenger & Cargo Terminal: 200,000 ㎡ - Car Parking (200,000 ㎡), Wastewater Treatment (100,000 ㎡/day), Market (150,000 ㎡)

<sup>5</sup> Ministry of Environment, Act on Assessment of Impacts of Works on Environment, Traffic, Disasters, etc., 2004

Group	Type and Size of Projects
Formation of Industrial Location and Industrial Complexes (6)	- National Industrial Complex, Local Industrial Complex, Industrial Complex of Rural Area, Small and Medium Industry Area, Free Export Zone: 150,000 ㎡
Development of Energy (6)	- Power Development, Electricity Facilities: 10,000 kw - Mining Industry (300,000 ㎡), Submarine Mining Industry, Oil pipeline & Oil Storage (100,000 kl)
Construction of Harbors (4)	- Fishing Port, Harbor Facilities, New Harbor: 300 m, 10,000 ㎡ - Dredge: 100,000 ㎡
Construction of Roads (3)	- Road: new road: 4 km, extension: 10 km
Development of Water Resources (2)	- Dam, Reservoir: 2M ㎡
Construction of Railroads (including urban railroads) (4)	- Railroad, City Railroad, High-Speed Railroad: 1 km - Cable Railway: 2 km
Construction of Airports (1)	- Airport (Runaway: 500 m)
Utilization and Development of Rivers (1)	- River Works: 10 km
Reclamation Works and Forest or Land Clearing Works (2)	- Filling-Up (300,000 ㎡), Reclamation (1M ㎡)
Development of Tourist Complexes (6)	-Tourist Industry, Resort, Hot Spring: 300,000 ㎡ -Park, Resort: 100,000 ㎡, Urban Park: 250,000 ㎡
Development of Gymnastic Facilities (5)	-Gymnastic Facilities, Cycling Race, Racecourse: 250,000 ㎡ -Youth Discipline Facilities & district: 300,000 ㎡
Development of Mountainous areas (2)	- Public Cemetery (250,000 ㎡), Grassland (300,000 ㎡), Transforming (200,000 ㎡)
Development of Designated Regions (2)	- Urban Planning and Development for balanced development of districts
Installation of Waste and excreta disposal Facilities (2)	- Night-soil Treatment (100 kl/day), Waste Landfill (300,000 ㎡)
Construction of Military Facilities (3)	- National Defense Facilities (330,000 ㎡), Navy Base Installations (100,000 ㎡), Military Air Base (Runaway: 500 m)
Excavation Works (4)	- River (50,000 ㎡), Forest (100,000 ㎡), Coastal Quartz Sand, Coastal Sand (250,000 ㎡)

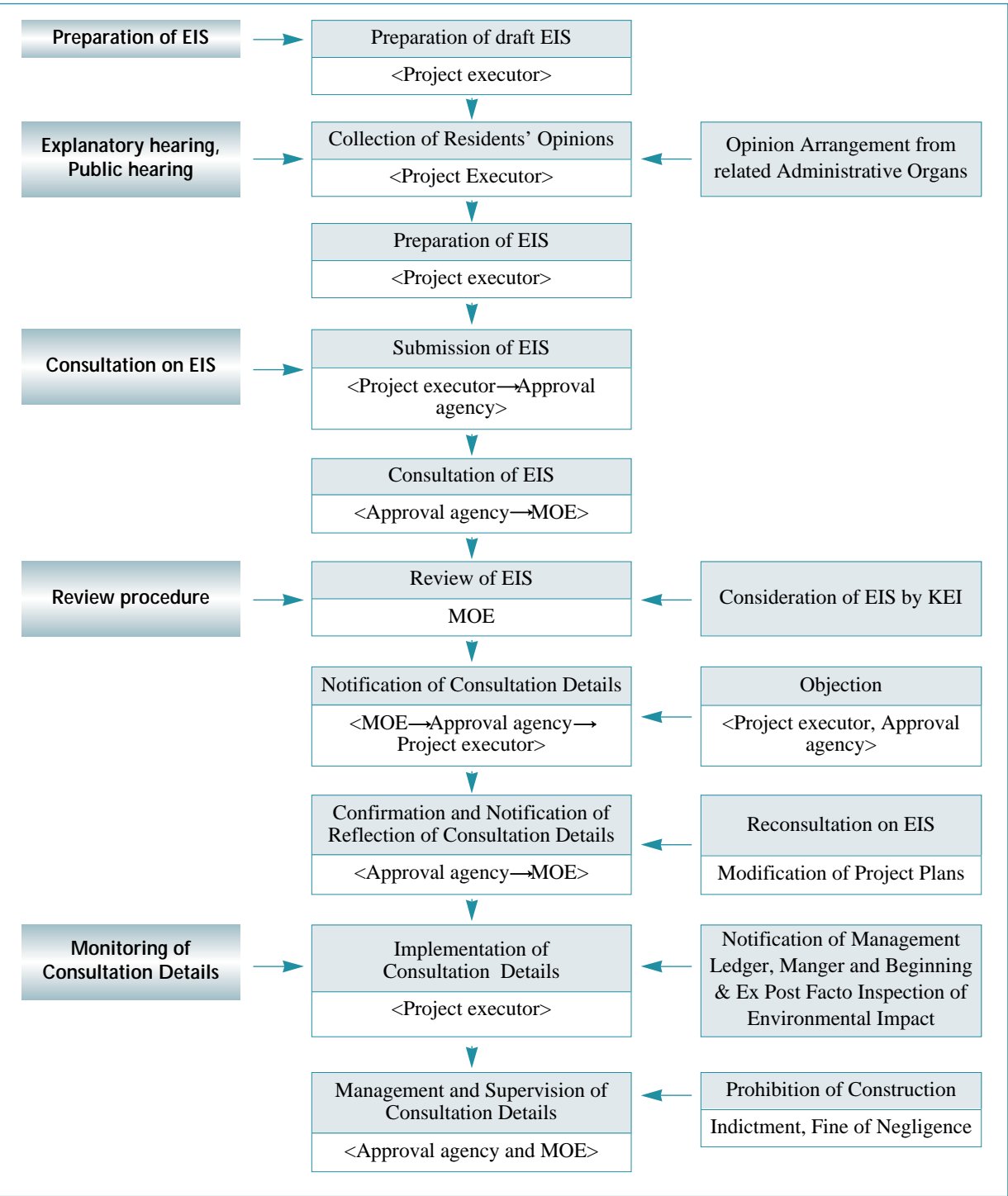
<Table 3> Items and categories stipulated in EIA

Categories	Environmental items
Natural Environment	Atmospheric Environment, Topography & Geology, Flora & Fauna, Marine Environment, Hydrology
Ambient Environment	Land Use, Air Quality, Water Quality, Soil, Solid Wastes, Noise & Vibration, Odor, Electric Wave, Shading, Landscape, Sanitation & Health
Socioeconomic Environment	Population, Residence, Local Industry, Public Facilities, Education, Traffic, Cultural Asset

and items comprise 23 items in 3 categories as shown in <Table 3>.

2.5 Procedures of EIA

The EIA process in Korea is composed of three



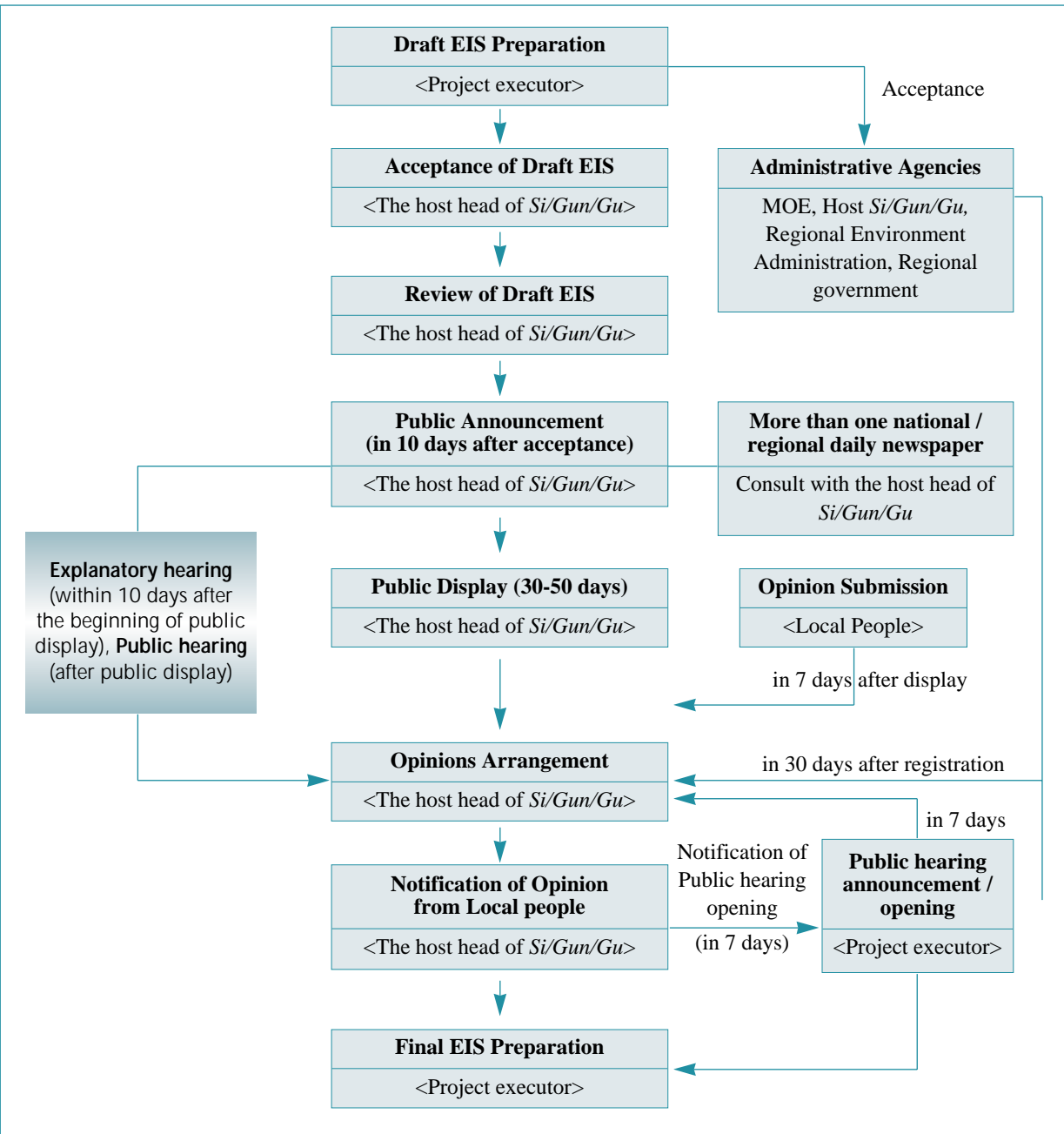
<Figure 1> The procedure of EIA. <sup>6</sup>

<sup>6</sup> Dong-wook Kim, Environmental Impact Assessment, GURU, 2004

stages: 1) a commencement stage where a preliminary assessment statement is drafted and displayed, announced or presented to local residents to collect their opinion, 2) a stage when a finalized assessment statement is submitted after collecting the opinions of local residents for approval of the project by the authority concerned and consulting with the Ministry of

Environment; and 3) a stage validating the compliance of consultation details and surveying post-impact assessment. The detailed procedures are described in <Fig. 1>.

- ① Drafting a preliminary assessment statement and collecting the opinions of local residents
- A preliminary EIA statement is drafted wherein a



<Figure 2> Public participation procedure in EIA.

project executor discloses the overall outline of the project to local residents and their opinions are collected prior to finalizing the EIA statement. A preliminary EIA statement should include assessment of 23 items in 3 categories, the current environmental conditions, analysis and assessment of alternative plans, high-level estimation of impact on each item and mitigation plans.

These are delivered to residents in a form of a presentation, a public hearing, or a public notice. The opinions collected through these efforts are included in the EIA statement. Any opinions not incorporated in the statement should be clearly stated, with rationales, in the EIA statement.

② Drafting the final assessment statement and holding consultations

The purpose of the finalized EIA statement is to submit the statement to a consultation authority and obtain the license and approval for the project by surveying the current environmental condition in detail on 23 items in 3 categories, forecasting and analyzing possible environmental impact from the launch and operation of the project as accurately as possible by mobilizing various techniques, in addition to developing appropriate mitigation plans.

The statement prepared by a project executor is submitted to a project approval authority and

forwarded to the Ministry of Environment (or Local Environment Authority) for consultation. In consulting the statement, the Ministry of the Environment notifies the outcome of consultation such as any revision or refinement to the project approval authority, if deemed necessary.

③ Managing consultation outcome and post-EIA review

In order to assure the effectiveness of the EIA, rigorous compliance with consultation details is critical. Naturally, a project executor needs to faithfully comply with consultation details. To this end, the executor has the duty to keep a registry of managing consultation details, designate a supervisor to manage consultation details, and conduct a post-EIA review. In the case that standards on emission concentrations of pollutants, which were finalized as a part of EIA consultation, are violated, charges to meet consultation standards will be levied. Meanwhile, in order to assure rigorous compliance with consultation details, a project approval authority, such as the local Environment Agency, needs to conduct on-site inspections and take such necessary measures as ordering the suspension of construction.

III. Overview of the Practice of Enforcing the EIA

3.1 Performance results

Although the EIA was adopted in 1977, it was in 1981 that EIA came fully into effect when the Regulations on Preparing the EIA Report were developed. In the beginning, only those projects led by the public sector such as administrative authorities and government-invested organizations were subject to EIA and the number of projects under the EIA system was relatively low. However in the 1990s when relevant laws and regulations were amended, the scope of assessment projects was expanded to include the private sector and the overall number of EIAs conducted also increased. As of 2003, EIA was performed on a total of 2,623 projects.

3.2 EIA-driven improvements of the environment

Since the 1970s, various social infrastructure such as roads and ports were built in Korea to spur on industrialization, urbanization and economic development. Also, to keep in pace with the improved standard of living, housing construction projects continued at fast pace. To address the depletion of resources and environmental issues, EIA was enforced in full

scale in the post-1980s, which, among other things, aimed to instill an environment-friendly development mindset among development executors and raise the awareness of local residents as to the importance of preserving the environment.

This paper reviews the environmental aspects that have been taken into account when initiating development projects since the introduction of the EIA, focusing on project types of relatively high volume and impact.

1) Road construction projects

The highest number of EIA consultations was conducted in the category of road construction projects since the introduction of the system. This is because roads are continuously built to accommodate cargo volume that grows along with industrial development and to facilitate inter-regional networking. Roads are no doubt indispensable infrastructure necessary for economic growth and regional development. However, topographical changes caused by road construction trigger a number of environmental problems, including destruction of habitats and social fragmentation.

In Korea where mountainous areas account for almost 70% of all territory and large and small waterways are scattered throughout the nation, the leading environmental impact caused by road construction is the destruction of mountainous areas by cutting off soil dispersal (creation of

<Table 4> The number of projects completing consultation in EIA<sup>7</sup>

Project group	Total	'82-'92	'93	'94	'95	'96	'97	'98	'99	'00	'01	'02	'03
Total	2,623	996	149	115	161	151	151	155	154	121	117	168	185
Urban Development	461	201	21	17	27	6	18	25	23	16	19	24	31
Development of Energy	328	244	4	11	22	15	12	3	3	3	2	2	7
Formation of Industrial Complexes	269	145	14	18	20	16	12	8	7	5	7	11	6
Construction of Roads	591	39	47	29	42	40	39	64	61	57	50	60	63
Development of Gymnastic Facilities	152	104	4	3	-	-	7	6	6	5	4	5	8
Others	822	263	59	37	50	44	63	49	54	35	35	66	70

<sup>7</sup> Ministry of Environment, The Environment White Paper, 2004

<Table 5> Tunnels and bridges built by year<sup>8</sup>

Years of completion	Total Length of route (km)	Tunnel			Bridge		
		Number	Total Length (m)	Length per km (m/km)	Number	Total Length (m)	Length per km (m/km)
1960s	304	2	287	0.287	119	3,375	10.9
1970s	929	10	4,198	4.5	196	9,334	10.0
1980s	326	14	6,290	19.3	539	46,437	142.2
1990s	482	115	73,601	152.7	2,382	280,278	581.5
2000s	646	127	98,542	152.5	2,237	259,766	402.1
Total	2,687	268	182,918	68.0	5,473	599,100	223.0

<sup>8</sup> Korea Highway Corporation, Internal data, 2004

slopes) and the destruction of watersheds and habitat fragmentation caused by creating artificial river embankments. In order to overcome environmental issues attributable to such topographical changes, as many tunnels and bridges possible are built in environmentally sensitive areas when the EIA is conducted. Construction of a tunnel or bridge costs 2~3 times more than building a regular road for the same distance. Nonetheless, they are considered a realistic measure for mitigating environmental destruction. In the 1960s~1970s prior to the adoption of the EIA, construction of tunnels and bridges for purposes of mitigating environmental destruction was very rare. However, beginning in the 1980s when the EIA was adopted, the share of tunnels and bridges in road construction increased. Particularly in the 1990s, the number of sites where tunnels and bridges were included in road construction rose considerably compared to the past and in fact tunnels and bridges account for about 65% of total road length.

The growing total length of tunnels and bridges in road construction indicates a shift from an economics-driven mindset in road construction projects to that which takes into account environmental issues. Indeed, EIA has fulfilled its role of making the attainment of such a shift possible.

In addition, from the 1990s onwards, EIA of road construction projects strongly reviews the possibility of building mitigation facilities such as eco-bridges, eco-tunnels and wildlife corridors. In fact, the actual number of these facilities is rising each year.

In addition to adopting various measures for mitigating the destruction of the environment by road construction projects, EIA also contributed significantly to raising the awareness of development executors on the subject of environment conservation. One good example is motivating the Ministry of Construction and Transportation, the authority that approves road construction projects, to conduct “A Study on Environment-Friendly Road Design Techniques” in 2001~2002. Based on this study, guidelines on road design taking environmental features into

consideration are currently being prepared.

2) Housing development projects

Since the 1970s, housing development projects were continually implemented to keep pace with urbanization. Especially since the 1980s, housing development became more common following the enactment of the Housing Land Promotion Act. Consequently, the housing supply rate, which hovered around 70% in the 1980s, soared to 94% as of 2000 thanks to the building and supplying of about 60,000 households each year since 1990. Despite such improvement in the housing supply rate, however, housing development projects are still actively being executed today due to the increasing number of nuclear families as well as single person households.<sup>9</sup>

Housing development projects have mainly focused on economics and quantitative supply of houses to resolve the housing shortage and have thus been lacking with regards to making serious environmental considerations. Housing development projects in Korea are usually undertaken in large spaces. Due to the highly mountainous topography of Korea, hilly regions and riverside and coastal areas were often included as project districts. Also, in the course of urbanization, remote rural areas were occasionally included in housing development projects, which often resulted in discordance with the surrounding natural environment and landscape.

Based on such aspects, common environmental problems faced during the process of initiating housing development projects may be summarized as the fragmentation of natural ecosystems, excessive destruction of forest areas, discordance with the surrounding natural environment and emissions of a large quantity of pollutants caused by population density. Among these, such environmental issues as the fragmentation of natural ecosystems and destruction of forest areas can be somewhat resolved by designating appropriate conservation areas within project districts. However, designation of a conservation area is a factor that

lowers the economics of a project. In quite challenging to secure enough space for the designation of a conservation area. Consequently, EIA has been applied since the 1980s to solve environmental problems caused by housing development projects through a balance between development and conservation as well as harmony of economics and the environment.

In the case of housing development projects, the conservation of an area with sound natural conditions becomes feasible by securing space for parks and greens space. Such areas as an outstanding recreational area for residents.

In the 1980s, although the EIA was applied to housing development projects, the amount of parks and green space as well as the amount of parks and green space were low because resolving the housing shortage remained the policy focus. However, in the 1990s, the share of parks and green space in housing development projects increased tremendously compared to the 1980s. In the 2000s, the average share of parks and green space and per capita amount of parks and green space reached 17.1% and 9.6 m<sup>2</sup>, respectively. Urban ecologist<sup>10</sup> claimed that the share of parks and green space in a housing development project should be at least 30% in order to maintain a sound and comfortable environment.

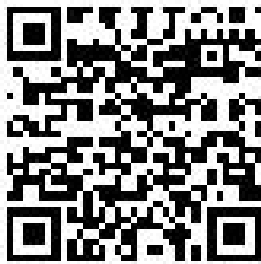
<Table 6> Trend of the share of park

Years	Number of development projects
1980s	7%
1990s	4%
2000s	2%

<Table 7> Environmental improvement

Years	Nature close stream
1995~1999	3 districts
2000~2004	15 districts

<sup>10</sup> Hyun-chan Seong, A Study on the Accessibility to Conservation Areas, 2004  
<sup>11</sup> Korea Land Corporation, Internal data, 2004  
<sup>12</sup> Korea Land Corporation, Internal data, 2004



预览已结束，完整报告链接和二维码如下：

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