

Environmental Impact Assessment for the Waste Landfill Site in the Republic of Korea

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Abstract

Most of the solid waste has been land-filled as an ultimate disposal method in Korea, with might induce many environmental problems by generating odor, particulates and leachate.

The landfill site should be considered as a kind of pleasant facility to neighboring residents. Currently, for a landfill site, while the environmental law requires to perform the EIA before the planning, EIA has been performed after the selection of the landfill-site.

That might be controversial to the purpose of doing EIA. In this study, the weaknees of the EIA for the landfill-site was analysed and was suggested for comprehensive EIA in Korea as well.

keywords : EIA, waste landfill site

I . Introduction

The rapidly-increasing rise in domestic waste, whose standardized disposal is becoming more and more difficult, calls for complex measures. These require the comprehensive pre-planning of waste management.

Domestic waste is primarily brought to waste landfill. This type of waste disposal meets strong resistance from the residents concerned. In the following, the question of how to take the ecological aspects of domestic waste landfill site planning into consideration (given current authorization procedures and the Environmental Impact Assessment procedure) will be looked at.

II . Waste Planning

In 1993, the per capita level of domestic waste in Korea amounted to 1.59 kg per day, 580kg/J exceeding that of other industrial countries. It is predicted that this level will rise to 1.96 kg/day per capita 907kg/J in 2001, which indicates a growth rate of 6.6%, i.e., approximately the growth rate of the Korean political economy. The present system of waste disposal is mainly organized around landfill. While more and more waste accumulates, this system is becoming more difficult to manage according to environmentally sound criteria.

In order to meet this problem, the government has developed a comprehensive plan for waste management, in the following, termed "Waste Planning".

Goals of state waste planning are:

- the reduction of waste accumulation, and
- the application of the principle of pollutant pay as well as

— balanced disposal through waste landfill and incinerators.

Table 1. Planning the Garbage Dump

	Total		1992		1993-1997		1998-2001	
	Number	Area	Number	Area	Number	Area	Number	Area
	1000m		1000m		1000m		1000m	
Total	192	42,356	9	13,477	148	14,739	35	14,140
Regional	169	12,116	7	161	130	10,315	32	1,640
Supra-regional	23	30,240	2	13,316	18	4,424	3	12,500

Source: Ministry of the Environment, 1995, Environmental Yearbook

The Waste Plan intends that waste accumulation decrease from 1.59kg/day per capita to 1.49kg/day per capita. As previously noted, the disposal of domestic waste is dependent on waste landfill. This dependence will be balanced out by the construction of incinerators. In 2001, 45% of the waste will be disposed of in waste landfill and 25% incinerated. 30% of the domestic waste will be recycled.

According to the Waste Plan, the number of waste landfill will grow from 9(1992), to 192(2001). In 2001 all landfill will be constructed per standard, which currently applies to more than half (58%).

On one hand, a larger number of garbage landfill is necessary, on the other, it will become more difficult to specify new ones. The reason is that much of the population exhibits the so-called NIMBY Syndrome (Not In My Back Yard!), i.e., that is "dirty" installations such as garbage landfill are not wanted in residential areas. One contributing factor is that in the past, the negative effects on environmental and living conditions were not sufficiently taken into consideration in waste planning.

Within the framework of the authorization procedure and the EIA measures which adequately hinder a negative environmental impact due to the construction of waste landfill must

be taken. These aspects will be examined in the following.

III. Authorization Procedures for Waste Landfill Site

Landfill for domestic waste must be authorized. Two steps are necessary for authorization. The local government, which is responsible for planning waste disposal, produces a feasibility study for the garbage landfill: and the Ministry of the Environmental must agree to it. To begin with, a landfill plan which contains the following points is prepared:

- facilities,
- management,
- scope of landfill
- surface area specification,
- treatment of leachate

(Waste Management Planning Law 25)

Leachate is treated so that the limit of 150mg/ℓ BOD is not exceeded. A further environmental protection measure is a covering of earth: after each layer of waste 15cm, and after the last layer at least 60cm. Another is to collect and use the gas from landfill. Within the framework of the authorization procedure, the question of alternative sites is not addressed, and environmental aspects relate only to the contents of the Landfill. Furthermore, only single issues such as water protection and keeping the air clean are placed in the forefront.

Because certain domestic garbage Landfill are obligated to have an EIA, procedures for carrying out the EIA and the extent to which ecological aspects are taken into consideration should be examined.

IV. EIA for Waste Landfill

1. Procedures for EIA

1) Initiating the EIA

As defined in the enforcement ordinance to the EIA law, there are presently 16 kinds of project in Korea which must undergo an EIA (Table 2). They are sub-divided into 59 project types. The project type "Waste Landfill" is subordinate to "Waste Disposal Measures." Project type and surface area with more than 300,000m² specification determine whether an EIA must be done. Then the EIA is automatically initiated.

As a rule, the EIA is initiated only after the site for the landfill has been fixed.

Table 2: EIA-Obigated Projects (Objects, not planning/plans)

- 1) City Development
- 2) Erection of Industrial Sites and Industrial Parks
- 3) Energy Production
- 4) Harbor Construction
- 5) Street Construction
- 6) Development of Water Resources
- 7) Construction of Railway Sections (incl. Underground)
- 8) Construction of Airports
- 9) Water Resource Production
- 10) River Use and Canal Construction
- 11) Development of Tourists Areas
- 12) Erection of Sport Facilities
- 13) Development Projects in Mountain Areas
- 14) Development of Special Areas
- 15) Erection of Waste and Feces Disposal Facilities (Waste Landfill)
- 16) Military Installations

In principle the body responsible for commissioning the project realizes the EIS itself. If this is not possible, the study commission can be granted to a planning office. The planning office (planning büro) has the right to do this, according to the

realization regulation of the EIA law, only if it possesses the appropriate license.

The local government responsible for planning the dump commissions a planning office planunp büro to prepare the EIS. However, the commissioning body is responsible for its content. There is a certain dependence between the commissioning body and the planning office, which can endanger the objectivity of the Assessment. Possibilities of monitoring do not exist for the first step of the procedure. These first come into play when the public becomes involved, in the third step.

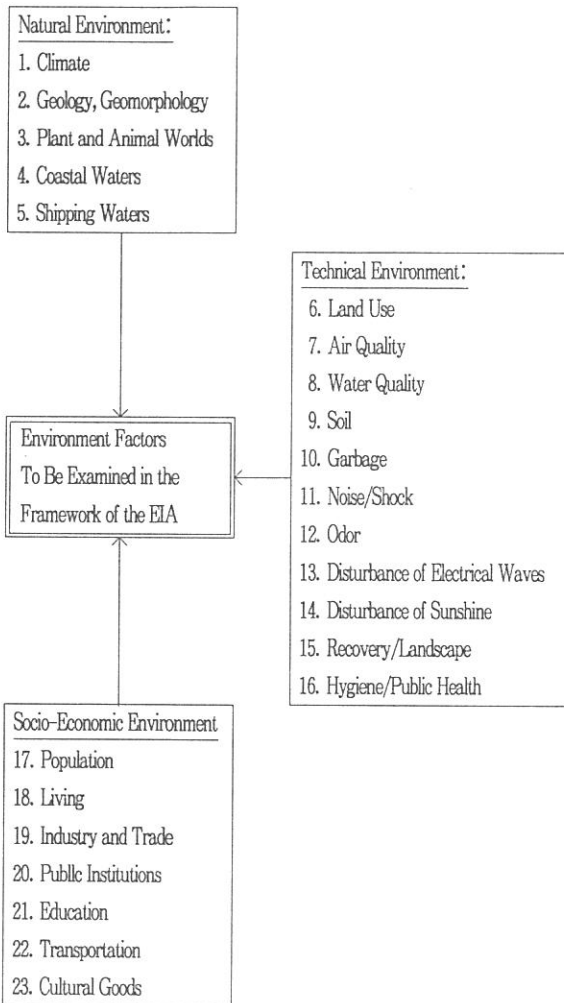
2) Setting the Investigation Framework (scoping)

In the Korean EIA system, there isn't a special procedure for fixing the extent of the examination. The rules about the production of EIS prescribe which environmental factors to examine (Table 3), and which special characteristics of the project and project site are to be taken into consideration. If it turns out that grave effects of the environment are attached to a project or site, they must be more thoroughly investigated. It is, however, not necessary to work out these special characteristics for each kind of project. The guidelines prescribe which environmental factors are to be focussed on for each project type. In the case of waste landfill they are:

- geomorphology,
- geology,
- flora and fauna,
- air quality,
- water quality,
- soil,
- odors,
- recovery,
- landscape,
- hygiene,

— public health.

Table 3. Environment Factors to be Examined in the Framework of the EIA



Water protection is the most important factor because, for the most part, leachate from waste landfill come from wet organic garbage such as leftover food.

The pre-conditions make the procedure easier, but impede the discussion between those involved (landfill planner, appraiser, commissioning body, and resident), who would properly be the ones to clear up misunderstandings or vagueness in

the waste planning. To include the resident in this step would help to eliminate the NIMBY Syndrome. Further, the schematic pre-conditions hinder a methodical development of the scoping investigation framework. (scoping)

3) Working-Out the Provisional Environmental Impact Assessment

Investigation of the environmental effects of a project proceed on two levels, i.e., a provisional and a definitive Environmental Impact Assessment are produced. The provisional statement is carried out in a closed session between the waste planner and the affected residents. Possibilities for compromise in respect to a technical solution to negative environmental effects are thus excluded. Above all, the commissioner of an EIA-obligated project must produce a provisional EIS with the following content:

1. Overview of the project,
2. Present environmental situation,
3. Analysis of environmental influences,
4. General presentation of the measures for reducing environmental influences.

4) Publication of the Environmental Impact Statement

When the EIS is completed, the competent authorities can voice their opinions about it. The residents affected have the first opportunity to examine the EIS and express their opinions about the predicted effects on their environment, property, and assets. They can explore possibilities for reducing the effects as well. If necessary, a public hearing where controversial aspects are discussed takes place. The hearing can sometimes become stormy, because the opponents are not easily moved from their original positions: the local government is under pressure and wants approval for its landfill planning as quickly as possible. The residents, as a rule, are skeptical about the EIS, they fear

a decrease in their living standards, i.e., a decrease in property value and/or a worsening of environmental conditions (noise, dust, hygiene). They want, with all their power, to prevent the construction of a waste landfill their neighborhood.

5) Producing the Definitive Environmental Impact Statement

The commissioning body, i.e., the local government, summarizes the arrived at position and the result of the public hearing, in order to give them consideration in the definitive EIS. When this is not done, the reason for this must be declared.

6) Evaluating the EIS

The registration administration (in the case of waste landfill planning the Ministry of the Environment) passes the EIS on to the examining administration, which reviews it for content. This review concentrates on the objectivity of the study, because it is prepared on a commission basis. The examining administration obtains the position of both the EIA commission, which is a division of the Ministry of the Environment, and the National Institute for Environmental Research.

However, the intervention of these third parties, which review the objectivity of the EIS is insufficient. If the EIS is shown to be lacking, it is sent back to the applicant with a request for improvement or addition. If necessary, the examining administration itself can conduct field research (material collection, analyses), in order to form its own judgement in respect to certain questions. This possibility is seldom used in practice.

7) Monitoring

In the past, after the EIS left the Ministry of the Environment, the Ministry did not monitor the applicant to see if the measures for reducing environmental damage had been car-

ried out. The Environment Minister had no means of forcing the applicant to carry out the reduction measures.

According to the new EIA law, monitoring is now primarily the task of the authorizing administration, which has better possibilities for monitoring than the examining administration. Furthermore, the commissioning body is obligated to post a plan of execution on the construction site, and to follow it.

An important element of the new law is that the examining and authorizing administrations have the authority to order that a project be broken off if it had begun before the completion of the EIA and disregards its agreed-upon content. In the case of planning a waste landfill, the EIA procedure goes through a third party, without the opportunity of monitoring. The administrations are more or less among themselves, which can detract from the quality of the study and the realization of environmental protection measures.

V. Summary

Domestic waste is mainly disposed of with the help of waste landfills. The residents concerned are skeptical about landfills because, for example, Leachke from a substandard landfill can cause water pollution. The authorization and EIA procedures for landfills are limited to single environmental aspects such as water pollution and odors. The affected residents are insufficiently included in the EIA procedure, so that little or nothing is done to influence their skeptical attitude. Better cooperative work among all those involved in the EIA is also desirable, in order to gain more transparency and objectivity.

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