A Study on Site Selecting for National Project including High Level Radioactive Waste Disposal

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1. Introduction

Many national projects are stopped since sites for the projects are not determined. The sites selections are hold by NIMBY for unpleasant facilities or by PYMFY for preferable facilities among local governments. The followings are the typical ones;

NIMBY projects: high level radioactive waste disposal, THAAD, Nuclear power plant(NPP), etc.

PIMFY projects: South-east new airport, KTX station, Research center for NPP decommission, etc.

The site selection for high level radioactive waste disposal is more difficult problem, and thus government did not decide and postpone to a dead-end street.

Since it seems that there is no solution for site selection for high level radioactive waste disposal due to NIMBY among local governments, a solution method is proposed in this paper. Especially, risk, cost benefit analysis method can be usefully used to determine the site selection. This site selection approach can be applied to other national projects or facilities.

2. Methods

2.1 Selection Method

Step 1: First, invite to bid by combining the high level radioactive waste disposal site and other preferable facilities (for example, Research center for NPP decommission). Maybe potential host local governments are requested to submit sealed bids indicating the minimum compensation sum that they would accept the high level radioactive waste disposal site [1].

Step 2: If there is no application or bid from local governments at Step 1, then select and technically check local governments according to the priority order recommended from a site selection system which is called PESS(Point Evaluation for Site Selection).

PESS consists of three modules as shown in Fig. 1. The 3 modules are explained in the following section. After site is selected, then positive points, proportional to the cost and benefit of the high level radioactive waste disposal site, are added to the points of the bidding regional government.

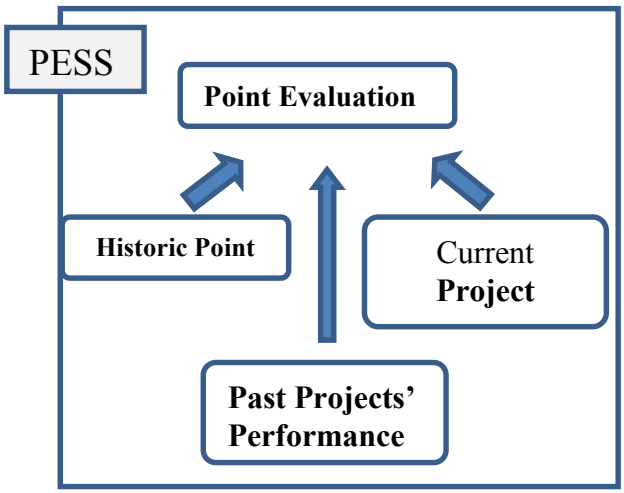

Fig.1 3 Modules of PESS(Point Evaluation for Site Selection)

Step 3: The local projects, which are PIMFY or NIMBY facilities among sub-regional authorities belonging to the local government, should be solved under the control of the local government. The solving process is very similar to the site selection method for the national projects.

If the local governments cannot draw a conclusion for the local projects, then the penalty should be considered in the PESS, and the penalty would become heavier every year.

Step 4: If the national project are delayed due to the objection of the selected local

government, a negative point will be added to the local government as a penalty.

2.2 PESS

PESS is consists of the following three modules;

a) Historic Point
b) Past Projects Performance
c) Current Project

Historic Point

In this module, the accumulated points are displayed according to the local governments. In the past, if a local government adopted many PIMFY national projects than NIMBY national projects, then the accumulated point of the local government would be negative value. On the other hand, the more NIMBY national projects were received by a local government, the larger positive point is accumulated.

Past Projects Performance

If a local project whose total project budget is above 50 billion Won, and for which central government support more than 30 billion Won, then the preliminary feasibility study of the project is performed by KDI (Korea Development Institute). However, many regional governments submit too much optimistic reports to KDI to pass the preliminary feasibility study event though the projects are not feasible in the real world. Therefore, after the projects were implemented, the regional governments who launched the projects suffer money loss for years. Typical examples are Muan International Airport and Yongin light rail .

Thus, in this module, for the past regional projects, current management performance is reflected. If the past projects have net benefit each year, then the net benefit amount is positively reflected in the point system. Of course, the total project budget of the project was already reflected as negative point. For NIMBY projects, the cost and benefit values are reflected as positive point in PESS. For PIMFY projects, total project budget is regarded as negative point in PESS.

Current Project

In the current project module, the results of risk, cost, and benefit analysis for the current projects are summarized according to the site candidates.

For example, if we decide a NPP site, then the risk and cost for a severe accident from candidates sites can be similarly estimated as in Ref. [2~4]. In the Ref. [2-4], population health effect cost, such as fatality, acute injury, and personal dose, etc., and replacement power cost, etc. are considered. For the high level radioactive waste disposal, similar risk, cost benefit analysis is required, and the cost and benefit values are added to the point of the host local government. Since the soil, population, underground water, etc. are different according to the different sites, different risk and cost is derived. Thus, we can evaluate different sites in the cost-benefit point of view.

3. Conclusions

To decide a high level radioactive waste disposal, the first step is to invite a bid by suggesting a package deal including PIMFY projects such as Research Center for NPP decommission. Maybe potential host local governments are asked to submit sealed bids indicating the minimum compensation sum that they would accept the high level radioactive waste disposal site.

If there are more than one local government put in a bid, then decide an adequate site by considering both the accumulated PESS point and technical evaluation results. If no local governments put in a bid, then negotiate with the local governments according to the priority order recommended from PESS, as mentioned in Step 2 of section 2.1.

By considering how fairly preferable national projects and unpleasant national projects are distributed among local government, sites selection for NIMBY or PIMFY facilities is suggested. For NIMBY national projects, risk, cost benefit analysis is useful and required since it generates cost value to be used in the PESS.

For many cases, the suggested method may be not adequate. However, similar one should be prepared, and be basis to decide sites for NIMBY or PIMFY national projects.

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