

Stakeholder Participation in Environmental Impact Assessment for Highway Project in Korea: a Case Study of Chuncheon-Yangyang Highway

Mihee Choi

National Assembly Budget Office (NABO),
Republic of Korea / miheec@nabo.go.kr

Key words: Stakeholder Participation, Public Involvement (PI), Environmental Impact Assessment (EIA), Environment Impact Statement (EIS), Road Construction Project, SOC

Abstracts

This study was to try to identify social discord factors through analytical method and then to confirm whether these factors were sufficiently taken into account in PI process and whether environmental impact statement (EIS) was seriously considered in the discussion. According to data, we utilize Public Involvement (PI) meeting documents, EIS, institution, and other research materials.

This case study found that the government did not inform stakeholders enough of the environmental impacts and laws related to environmental change by the project. Secondly, it did not collect enough stakeholders' opinions through PI. Thirdly, it did not consider environmental effect on the rice paddy field in decision-making process by neglecting to connect PI connecting to the EIA system.

In Conclusion, it is very desirable from sustainability viewpoint that various stakeholders should be included in decision-making process of SOC construction project in Korea. And the EIS should reflect the results of discussion with stakeholders. For that, we need to institutionalize PI in environmental impact assessment (EIA) process and prepare an appropriate PI operation guideline.

1. Introduction

Environmental damage and change of property rights owing to social overhead capital (SOC) construction has lead to social conflicts in Korea. According to Korean Highway Corporation's report, annually 3000~4000 cases of conflicts arose in road construction projects. Lacking consideration of harmony between economic growth and environmental protection from the viewpoint of sustainability mainly caused the frequent discord. Especially important cause is that citizen's participation in decision-making process is unsatisfactory.

This paper investigates problems and improvement plans of citizen's participation in environmental assessment of the Chuncheon-Yangyang highway construction project as a typical case in Korea. This highway is a large-scale construction project that crosses Baekdudaekan, Korea's main forest ecosystem. Baekdudaekan is protected region by "Baekdudaegan Protection Law." Though some part of it is designated as UNESCO biosphere conservation area, the highway construction project attempts to pierce section of Baekdudaegan and build a 71.7km long tunnel.

To solve social conflict surrounding the construction of tunnel, the government chose to adapt Public Involvement method in decision-making process of Chuncheon-Yangyang highway construction project. The government opened a homepage (<http://www.ccyip.net>) to put PI in operation and held a conference on the discord prevention, with local government officials, local council members and regional civic organization.

This study was to try to identify social discord factors through analytical method and then to confirm whether these factors were sufficiently taken into an account in PI process and whether EIS was seriously considered in the discussion. According to data, we utilize PI meeting documents, EIS, institution, and other research materials.

2. Stakeholder participation in Decision-Making

2.1 Decision-Making Model: Public Involvement (PI)

(1) Conceptual frameworks for PI¹

Most of what usually called is "Public Involvement" which takes place in the third branch of government, the executive branch. PI theory was developed by Thomas (1995). He has developed the Effective Decision Model of PI based on a theory borrowed from the literature on small group decision-making (Vroom and Jago 1978; 1988; Vroom and Yetton 1973) and empirically tested for issues of PI. It attempts to combine "a balanced perspective on what can realistically be expected from public involvement and a contingent perspective on how those expectations should vary according to the situation" (Thomas, 1995).

(2) Decision-Making Model

Decisions to be made in developing a public involvement program include determining: (1) whom to involve, (2) what specific forms of techniques to use, and (3) when and how often to involve the public. Before these choices can be made, however, the public manager must decide how much influence

¹ In the literature the terms "public involvement," "public participation," "citizen involvement," and "citizen participation," are often used interchangeably. Throughout this paper I will use the term public involvement.

and information should be shared with the public.

The Effective Decision Model (Figure 2) is a binomial decision tree structure. The model “inputs” are the manager’s answers to seven questions about the characteristics of the issue at hand. The outcome of the model is five different decision-making approaches (see Table 1).

(3) PI Techniques

Heberlein(1976) identified four specific functions of public involvement: (1) one or two-way information flows between the agency and the public, (2) working together to solve a problem, (3) assuring the public that the agency is considering their views, and (4) a ritualistic function necessary to fulfill legal requirements. Few PI methods to be used in a particular situation depend largely on the goals of the public involvement process. How an agency actually conducts the public involvement process of the process (Chess and Purcell 1999).

Several of the more widely used methods are explained here (Figure 3).

2.2 Procedural rationality and deliberative institutions to evaluating ecosystem

Ecosystem is a complex system. Therefore, the subject is how to overcome uncertainty and irreversibility of which could be changed by development. Because of these reasons, phenomenology access is the most suitable decision. In decision-making, stakeholder’s participation is the most important part. In this case, procedural rationality and deliberative institutions are mostly needed (Jacobs, 1997).

A reasonable decision-making process is far more important than the result. In this process, since stakeholder cannot consider all effects by development, they may not consider the scope of impact and uncertainty of the change by development. In Decision-process, a stakeholder can study the effects caused by development through exchanging personal views to one another. Therefore, when we anticipate uncertainty of ecosystem change by development, collective decision-making process is important (O’Connor et al., 1996).

Essentially, it needs to include public forum in decision-making of different level for this purpose. Various opinions could be gathered by discussing amongst themselves before coming to conclusion. For example, at the forum, each stakeholder had his or her own opinion. While in discussion, their opinions could be persuaded but each has their own interest and ideas and does not guarantee in their final decision. Therefore, voting to take final agreement might not be the best choice but the second best. This agreement could be beneficial to interest of society and competitive judgment but may not satisfy individual preference. It is needed an established institution to solve disagreements and constructs process of negotiation (Faucheux and O’Connor, 1998).

In conclusion, be cause of the uncertainty and the irreversibility of ecosystem change by development, procedural rationality and deliberative institutions are important in decision making (Faucheux and Munda, 1997, 56-58).

3. Stakeholder participation system in Korea

3.1 Stakeholder participation in Environmental Assessment system

(1) Stakeholder participation in strategy environmental impact assessment (SEIA)

Environ Politics Fundamental Law (EPFL) regulate SEIA about administrative plan. In SEIA there is public involvement system, which is Environmental impact assessment committee. Committee has 10 members, such as inhabitants, expert, environment group, committee institution. Committee grasps important environment issue by plan enforcement and chooses logical opposite bank. They adapt scoping about environmental impact by administrative plan and evaluate the environmental effect and establish alternative plan. Through this, it has minimized environmental impact.

(2) Stakeholder participation in Environmental impact assessment (EIA)

Environmental Impact Assessment Law (EIAL) regulates EIA about development plan. There is no scoping system about development project. As well as, there is no dutiful regulation about alternative plan, environmental impact association committee, opinion reflection etc unlike administrative plan.

Development project enterpriser makes EIS draft and original bill and the Ministry of Environment (MOE) thanks heartily about agenda that submits. This time, developers must listen to opinion of region's inhabitants who has been influenced from development enforcement. After they hold briefing session or public forum, those opinions can be reflected to EIS. When developers develop the important ecosystem, like Baekdudaegan, they must listen stakeholder's opinion and include his or her opinion to the Environmental Impact Statement (EIS).

Juyongjun(2002) classified public opinion which was collected on EIS from 1998 to 2001. The result as follows: "Environmental effect minimization" was estimated to 71 items (33.8 %), "road Route alteration" 54 items (25.7 %), "Accommodation establishment" 47 items (22.3 %), "Damage" 23 items (11.0 %), etc.. to 15 items (7.2 %) out of 210.

3.2 Public Involvement

PI system was introduced from the MCT to solve alignment and environmental issue on October 2004. This system was introduced to minimize economical damage and administration disbelief caused by stakeholder's conflict in development project. As MCT did not solve environmental dispute with the Stakeholder participation system in SEIA and EIA, the government introduced PI system.

Stakeholder participates directly over all stage from road building design in the PI system. Government listens to NGO's opinion including local residents. And that opinion reflected to design of project through the whole processing. Stakeholder such as local resident, environment group, and local

government participate directly in project achievement process.

MCT introduced PI system at first in the project of Chuncheon-Yangyang high velocity (HV) from 2005 to 2006. At this time, there was no relationship between EIA of MOE and PI system of MCT.

4. Case study of Chuncheon-Yangyang Highway

4.1 Information of Baekdudaekan ecosystem

(1) Baekdudaekan ecosystem

Baekdudaekan is the core ecosystem of Korean Peninsula. That includes mountains and rivers from Mt.Baekdu to Mt.Chiri. Its length reaches for 1,470km and makes Korean Peninsula's line of the backbone. The concept of Baekdudaekan is that mountain range is connected with watercourse. Which means the mountain does not cross water and water does not pass over the mountain, that is, the order of nature. Interpretation of such nature, Baekdudaekan is the unique viewpoint of nature and the method that express geopolitic attribute (Figure 1). As a result, it contains culture and historic meaning.

Baekdudaekan Mountain range contains 13 of Korea Peninsula's mountain ranges and watercourse. MOE announce that 70~80% of Korean wild animals and plants are living in the Baekdudaekan. There are 7 national parks and an ecosystem conservation area that was specified by UNESCO. Such an interpretation of Korea's ecosystem can be expressed as an ecology concept.

When we borrow concept of scenery ecology, Baekdudaegan can be analyzed passageway and piece role. Baekdudaekan contains large-scale forest zones and mosaic land pieces. We can call it a huge passageway when forests reach long lain topography. Baekdudaegan ecosystem is the meter of the criteria of Korean Peninsula ecosystem whether it is healthy or not. Because Baekdudaegan is the core foundation of ecosystem, that can be the representative of natural environment. It is the part of water resources, habitat and passageway of wild animal. It is the lung of country and trunk of life. Thus, Baekdudaegan can be explained as a Geopolitic realization of human being that contains Peninsula's climate, history, custom, dialect and the information of almost all topographic features such as mountain range and water course.

(2) Pressure of development

A large-scale development project, which causes a lot of changes in Baekdudaegan, has been continued. For example, there are mines, dams, routes, leisure facilities, farmlands and military bases in construction project area. Ecosystem can be destroyed on a large scale by development. MOE announce that 8% of 308km² among Baekdudaegan gross area of 4,386k m² is damaged. There are many paths up to mountains, forest road and pavement over Baekdudaegan area. The development cause erosion and

sweep away sands in rainy season.

Baekdudaegan ecosystem is in damaged condition by construction of road and railroad. There are a lot of roads; 30 Pavements, 3 railroads and 20 forest roads, which go through in Baekdudaegan. Every 7.88km, there is a road in Baekdudaegan. 9 calzadas are passed in Baekdudaegan national park which means wild animal living in the habitat needing over 8km can not survive - the road traffic prevents the migration of wild animals. Again, it did not consider nature of ecosystem character in developing design. Road can not be used in heavy storms (typhoon) or damaged by flooding. Therefore, Baekdudaegan natural environment is seriously damaged condition.

(3) Harmonies of preservation and development: The Baekdudaegan protection Law

Baekdudaegan is the Korea's unique geography concept. Therefore, harmonies of preservation and development are needed from this concept. Baekdudaegan is the symbol of national notion, people consider the Baekdudaegan as the center of universe and core of ecosystem.

The Korean Government has passed the Baekdudaegan protection law in 2003. "Forest Administrator establishes general plan along with principle and standard which the Ministry of Environment Minister decides and designate the protected regions. Protected region divided into point area and shock-absorbing area according to ecological special quality of relevant area. Point area is 2,149km that is about 49% of whole area and this area is specially protected region. Buffer zone (shock-absorbing area) is the contiguity area of point area and it includes necessary area for protection of point area. For this purpose, we have the Baekdudaegan protection committee and Prime Minister as a chairman who deliberates main policy". In the future, we cannot develop in protected region except unavoidable development project such as national defense and military installations.

On the other hand, according to Natural Park Law, road can not go through national park. Except under unavoidable circumstances, with Ministry of Environment Minister's approval or admission, the roads could be built with consideration of stakeholder's opinion.

4.2 Chuncheon-Yangyang high velocity (HV) project

(1) Outline of the project

According to Chuncheon-Yangyang high velocity (HV) project which will go through the UNESCO biosphere reservation in Baekdudaegan. This project will pierce Baekdudaegan that is propelled first since Baekdudaegan protection law. This project is a large-scale road construction that will have 4 lanes and estimated project expenses totaling around 3,843,900,000,000 wons. Also, the project plans to build 71.7km long tunnel. Out of 71.7km, 10.9km will pierce Baekdudaegan.

(2) Environmental Disagreement

The NGO has interest in importance of primal natural environment of project area and

Baekdudaegan protection. NGO insists: C-Yangyang high velocity (HV) passes lower edges of Mt. Jeombong and Mt. Bangtae which contains UNESCO biosphere conservation area. As well as, it passes Naerin stream that is a Korean representative clean stream. Project area is the best nature ecosystem of South Korea. Project area pierces forest ecosystem and streams ecosystem which is the center of Baekdudaegan.

Therefore, government needs to investigate the impact in streams ecosystem and forest ecosystem. Because this project is lacking in consideration of Baekdudaegan's ecosystem. Currently Baekdudaegan is pierced road in average 7.88km. If we build another road that will pierce Baekdudaegan, it will be destroyed enough will not recover anymore. Then, Baekdudaegan protection law will not have any meaning.

(3) Comparison of government and NGO opinion

The NGO claims that superhighway construction between Chuncheon-Yangyang can cause collapse of ecosystem. On the other side, government claims that it is considered enough about environment effect reduction and habitat restoration plan.

4.3 Public forum at EIA and Public Involvement in Chuncheon-Yangyang project

(1) Public forum at EIA: MOE management

According to Environment Impact Assessment Law, developer held Public forum while in process of the EIS about Chuncheon-Yangyang high velocity (HV) project. This public forum was held separately from PI. Through public forum, stakeholders examine problems of EIS draft and the result reflected to EIS. In EIA initial phase and process, there was no stakeholder participation.

(2) Public Involvement: MCT management

(A) Setup

Let's see in detail about PI held separately with the EIA. Government proposed PI to stakeholder on February, 2005, separately from EIA. The Ministry of Construction and Transportation held five meetings with NGO from May to July of 2005. Of course MOE didn't participate in these meetings. MCT proposed to discuss reduction plan in this meeting and the NGO proposed to discuss the feasibility whether to build road.

On July 2005, MCT and NGO asserted their own opinions but did not arrive in mutual agreement in TV debate. The NGO claimed that not to build Chuncheon-Yangyang high velocity (HV). They insist on considering environmental impact after confirming the necessity of road construction. Also, claimed road construction that could cause serious damage to Baekdudaegan ecosystem and that need to reconsider the project at early stage.

On September 2005, the NGO held the forum "How to handle PI at Chuncheon-Yangyang

project.” MCT's road director, expert, local resident, and member of the National Assembly etc. participated at this forum. MCT's road director proposed that in PI's only Stakeholder participate. The NGO welcomes PI.

Government judged that negotiation is impossible by conference with NGO and decided to enforce PI.

(B) PI process

MCT opened a homepage (<http://www.ccyipi.net>) to put PI in operation and held a “Conference on the discord prevention,” where local government officials, local council members and regional civic organization. Of course MOE didn't participate this meeting. MCT did not have any conference regarding PI composition with MOE. MCT composed inquiry committee.

MCT held three “Conference on the discord prevention” from September 2005 to March 2006. MCT policy maker was only interested in route change, tunnel furtherance, interchange establishment, and method of construction. MCT accepted only inquiry committee's advice on this. MCT was not interested in discussing in social request item, which is "propriety re-verification and rigorous environment effect investigation of project.”

(3) Disagreement of MCT and MOE

As a result, the MCT keeps PI separately with briefing session or public forum at EIA. MCT's only purpose was to take enough opinions of stakeholders such as local government, civic group, and local resident and to reflect this to process of development project. Because there is no link between PI and EIA systems, stakeholder's opinion can hardly be reflected on environmental impact statement (EIS).

4.4 Discovery in PI system of Chuncheon-Yangyang project

(1) Processing inadequacy of decision-making model

The public manager has to decide how much information will be shared with public. But in PI of this project, MCT did not provide necessary information to participants (for example: environmental impact). Even if with provided necessary information, the impact by development cannot all be considered. Therefore, the reasonable processing is more important than decision-making result. To gather stakeholder's opinion, including PI progressing in the EIA processing would be desirable. It is true to gather stakeholder's opinion through PI. But, without enough information that needed in decision-making, it is inadequate.

(2) Mistress of PI results and EIS

According to results that PI and EIA have preceded separately, PI discussion result did not reflect a little to EIS. Through PI, MCT and stakeholder changed road route and road construction method.

But, Baekdudaegan ecosystem impact, point of social argument, did not reflect. Because they were not provided full information, stakeholders had to make a decision without enough knowledge of environmental effect.

Chuncheon-Yangyang planned route is divided as follows: point area 1.60km (tunnel), shock-absorbing area 1.36km (tunnel) and 2.37km (stealing section). Also MCT decided bore tunnel instead of building bridges in main ecosystem such as Naerin stream, Bangtae stream etc. The reason being, PI has strong opinion about importance of ecosystem. MOE reflected it to EIS draft. It is not evaluated whether to build bridge or bore tunnel which costs more or less and which would have less damage to the environment.

Regarding making tunnel in Baekdudaegan area, after reviewing the impact of underground water, vegetation and wetland etc in EIS draft, MOE present opinion that for decreasing environmental impact surrounding vegetation, it is needed to transfer naturally and provide new habitat and hiding-places for wild animal. The opinion of MOE to EIS draft is constructing road and minimizing influence. MOE does not take the NGO's idea. The NGO who opposes road construction itself is claiming that it is undesirable to bore tunnel that passes main streams and Baekdudaegan.

MCT insists that PI was successful. But, stakeholder's idea was not reflected in decision-making system that makes mutual agreement through studies about problem and changes their ideas. As a result, PI failed to accommodate each organization's situation, namely MCT and MOE and NGO.

4.5 Recommendations for PI in EIA

(1) Factor analysis of disagreement

When there is assessment negligence about natural environmental effect, environmental disagreement occurs. Stakeholder thinks that environmental effect is uncertain and irreversible. But MCT regards environmental effect is not serious. Natural environmental effect by development is uncertain, discord between government and citizen is hard to solved. Thus these factors must be reflected to PI in EIA.

(2) Solution device

Uncertainty, irreversibility, and complexity of ecosystem change, important point in decision-making comes on conclusion that is procedural rationality than essential rationality.

The Korean Government need construct stakeholder participation system to guarantee procedural rationality. The environmental impact statement (EIS) should reflect the results of discussion with stakeholders. For that we need to institutionalize PI in environmental impact assessment (EIA) process and prepare an appropriate PI operation guideline.

And government constructs enough natural environment connection D/B that can examine environmental effect by development and develops estimate model.

(3) Public Participation System

In Public participation method, there are key contact, direct mail, workshops, public meeting, ad hoc committee, advisory groups, questionnaire survey, report, day-to-day contact, mass media etc. According to private plan, government can choose suitable method.

First, Stakeholder's participation from environmental assessment proposal step to final step is need to be systematized. Second, when there is important discord, systematized public forum can solve this matter. Third, through Internet homepage, stakeholder could share their opinions and confirm about last decision-making. Fourth, when it is needed, the government educate stakeholder.

5. Conclusion

This study tried to identify social discord factors through analytical method and then to confirm whether these factors were sufficiently taken into account in PI process and whether environment impact statement (EIS) was seriously considered in the discussion. As data, we utilize PI meeting documents, EIS, institution, and other research materials.

This case study found that the government did not inform stakeholders enough of the environment impacts and laws related to environment change by the project. Secondly, it did not collect enough stakeholders' opinions through PI. Thirdly, it did not consider environmental effect on the rice paddy field in decision-making process by neglecting to connect PI connecting to the EIA system.

In Conclusion, it is very desirable from sustainability viewpoint that various stakeholders should be included in decision-making process of SOC construction project in Korea. And the environment impact statement (EIS) should reflect the results of discussion with stakeholders. For that we need to institutionalize PI in environmental impact assessment (EIA) process and prepare an appropriate PI operation guideline.

Reference

- Chess C. and K. Purcell, 1999, Public participation and the environment: What do we know? ,
Environmental Science & Technology 33(16): 2685-2692.
- Choi M. H., 2006, Problem and improvement of road EIA, *National Assembly Budget Office*, 193-262.
- Faucheux and Munda, 1997, "Toward an integration of uncertainty, irreversibility, and complexity", in
J.C.J.M van den Bergh and J. van der Straaten(eds), *Economy and ecosystems in Change*, Edward
Elgar.
- Heberline, T.A., 1976, Principles of public involvement. Department of Rural Sociology, University of
Wisconsin, Madison.
- Jacobs, M., 1997, "Environmental valuation, deliberative democracy and public decision-making
institutions," in Foster(1997) (eds.): 211-31.
- J. Ellen Force and Deborah J. Forster, 2002, Public involvement in National Park Service, *Social Science
Research Review*, Vol. 3, Number 1.
- Joo Y.J., 2002, Public participation effectiveness plan of EIA, *Environmental Forum*, Korea
Environmental Institute, Vol. 6, Number 4.
- O'Connor, M.S. Faucheux, G. Froger, S. Funtowicz and G. Munda, 1996, "Emergent complexity and
procedural rationality: Post-Normal Science for Sustainability," in R. Costanza et al(eds.)(1996) : 224-
47.
- Thomas J.C., 1995, Public participation in public decisions, San Francisco, CA: Jossey-Bass Publishers.
- Vroom, V.H. and A. G. Jago, 1978, On the validity of the Vroom-Yetton model, *Journal of Applied
Psychology* 63: 151-162.
- Vroom, V.H. and A. G. Jago, 1988, *The new leadership: Managing participation in organizations*,
Englewood Cliffs, NJ: Prentice-Hall.
- Vroom V.H. and P. Yetton, 1973, *Leadership and decision making*, Pittsburgh, PA: University of
Pittsburgh Press.

Table 1. The Inputs and Outputs of the Effective Decision Model

INPUTS: Characteristics of the issue at hand	Explanation
1. What are the quality requirements that must be incorporated in any decision?	Refers to the policy or managerial constraints on the nature of the decision: (1) technical/scientific constraints which limit solutions, (2) regulatory or legal constraints that must be included in any solution, and (3) budgetary constraints on how much money can be spent on the solution.
2. Do I have sufficient information to make a high-quality decision?	Includes information on: (1) how well a decision will work in the field, (2) public preferences (what kinds of solutions potential consumers of the program prefer), and (3) the technical aspects of the Problem or Possible solutions.
3. Is the problem structured such that alternative solutions are not open to redefinition?	As much as possible, managers should begin public involvement before the problem becomes structured with limited alternative solutions.
4. Is public acceptance of the decision critical to effective implementation? If so, is that acceptance reasonably certain if the manager decides alone?	If implementation hinges on acceptance, involvement increases the likelihood of acceptance and nurtures citizen "ownership" of the decision.
5. Who is the relevant public? And does that public consist of an organized group, more than one organized group, an unorganized public, or some combination of these?	The relevant public includes individuals and all organized and unorganized groups of citizens who could provide information useful in resolving the issue or making the decision or who could affect the ability to implement the decision or who could affect the ability to implement the decision either positively or negatively.
6. Does the relevant public share the agency goals to be obtained in solving the problem?	The answer to this question affects how much decision-making authority will be shared with the public.
7. Is there likely to be conflict within the Public on the preferred solution?	Conflict within the public and/or between the public and agency may call for more involvement in order to place some do the responsibility for resolving conflict on the public, rather than just on the manager.

OUTCOMES: Decision-making approaches	Explanation
1. Autonomous managerial decision	The manager solves the problem and/or makes the decision without public involvement.
2. Modified autonomous managerial decision	The manager seeks information from some segments of the public, but makes the decision in a manner that may not reflect group influence.
3. Segmented public consultation	The manager shares the problem separately with segment of the public, getting ideas and suggestions, then makes the decision reflecting group influence.
4. Unitary public consultation	The manager shares the problem and suggestions with the public as a single assembled group, and then makes a decision reflecting group influence.
5. public decision	The manager shares the problem with the assembled public and together the manager and the public attempt to reach agreement on a solution.

Source: Thomas J.C., 1995; J. Ellen Force and Deborah J. Forster, 2002

Table 2. Item that reflect PI conclusion to EIS

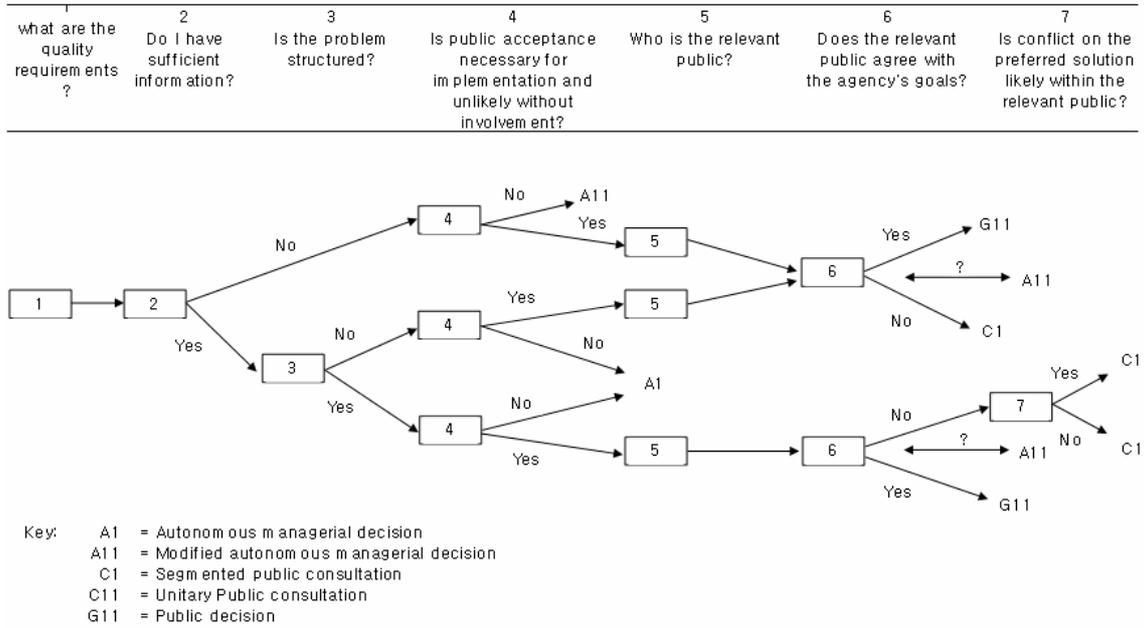
PI results	EIS draft reflections
feasibility of road building	Late, discussion
Committee composition need	Stakeholder participation plan groping by conference composition
Ecosystem impact evaluation by tunnel construction	Impact evaluation schedule that tunnel construction gets to ecosystem and groundwater level
Environmental damage reduction plan preparation by stream reach construction	Direction examination that do not establish bridge in main rivers being good to ecosystem such as Naerin stream Bangtae stream

Fig1. The Korea Peninsula is tiger shape



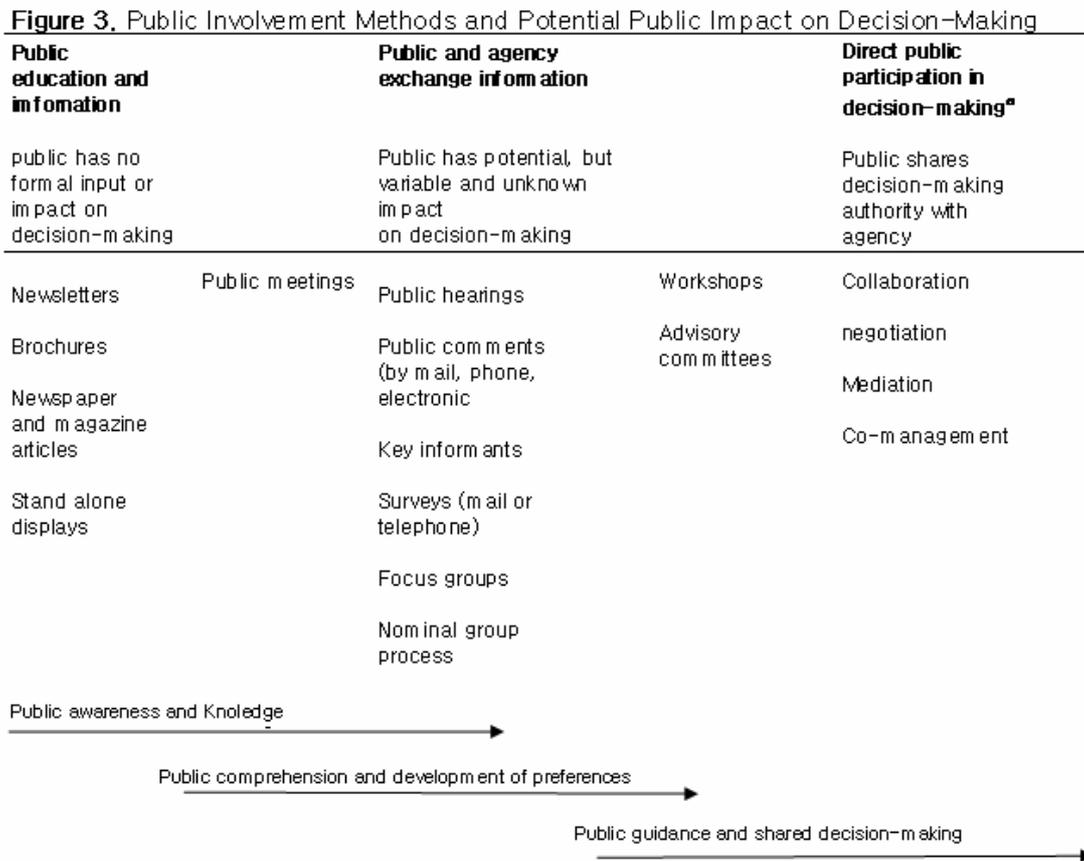
Fig 2. The Effective Decision Model of Public Involvement

Figure 2. the Effective Decision Model of Public Involvement



Source: Thomas J.C., 1995; J. Ellen Force and Deborah J. Forster, 2002

Fig 3. Public Involvement Methods and Potential Public Impact on Decision-Making



*The methods that involve shared decision-making authority with federal agencies are not the focus of this paper.

Source: J. Ellen Force and Deborah J. Forster, 2002