EIA Good Practices in Korea:

Landfill SEA to consider alternative site

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Contents

Project Overview of Landfill Development

- **Category;** Cheongju-si 2nd landfill development project (municipal waste treatment facility)
- **Area;** About 240,000m²
- **Capacity;** 2.2 million tons
- **Approval Authority:** Chungcheongbuk Province
- **Business operator:** Cheongju city
- **Two Alternative Sites are compared**

Project Overview of Landfill Development

- **Project timeline**
  - ✓ 2013.08 : Making a notice of site selection plan
  - ✓ 2014.10 : Composing the cheongju 2nd landfill siting committee
  - ✓ 2014.12 : Receiving application forms from two villages
  - ✓ 2015.04 : Starting a feasibility study of the sites
  - ✓ 2015.07 : Collecting opinions from local residents
  - ✓ 2015.11 : Completing the consultation on Strategic Environmental Assessment(SEA) report
  - ✓ 2015.12 : Notifying Site Selection and Decision of the Landfill
  - ✓ 2016.09 : Preliminary and Execute Design of the Landfill
  - ✓ 2017.05 : Beginning the construction
  - ✓ 2019.12 : Finish the construction
  - ✓ 2020.01 : Beginning the landfill

Background and Issues

- In Korea, there were a lot of conflicts about the location of waste facilities.
  - Local residents often opposed the project due to the odor, and bad landscape

- A Site had already decided in most case.
  - Site alternatives should have been reviewed since Strategic Environmental Assessment(SEA) was introduced
  - But actually, it was rarely done.

- In「Act on promoting installation of waste treatment facilities and supporting surrounding areas」,
  it is required to compose 'Siting committee' and select a proper site (Article 9)
  - Siting committee members for this project:
    Environmental professors(4), Resident representatives(3),
    City councilor(2), Public officials(2)

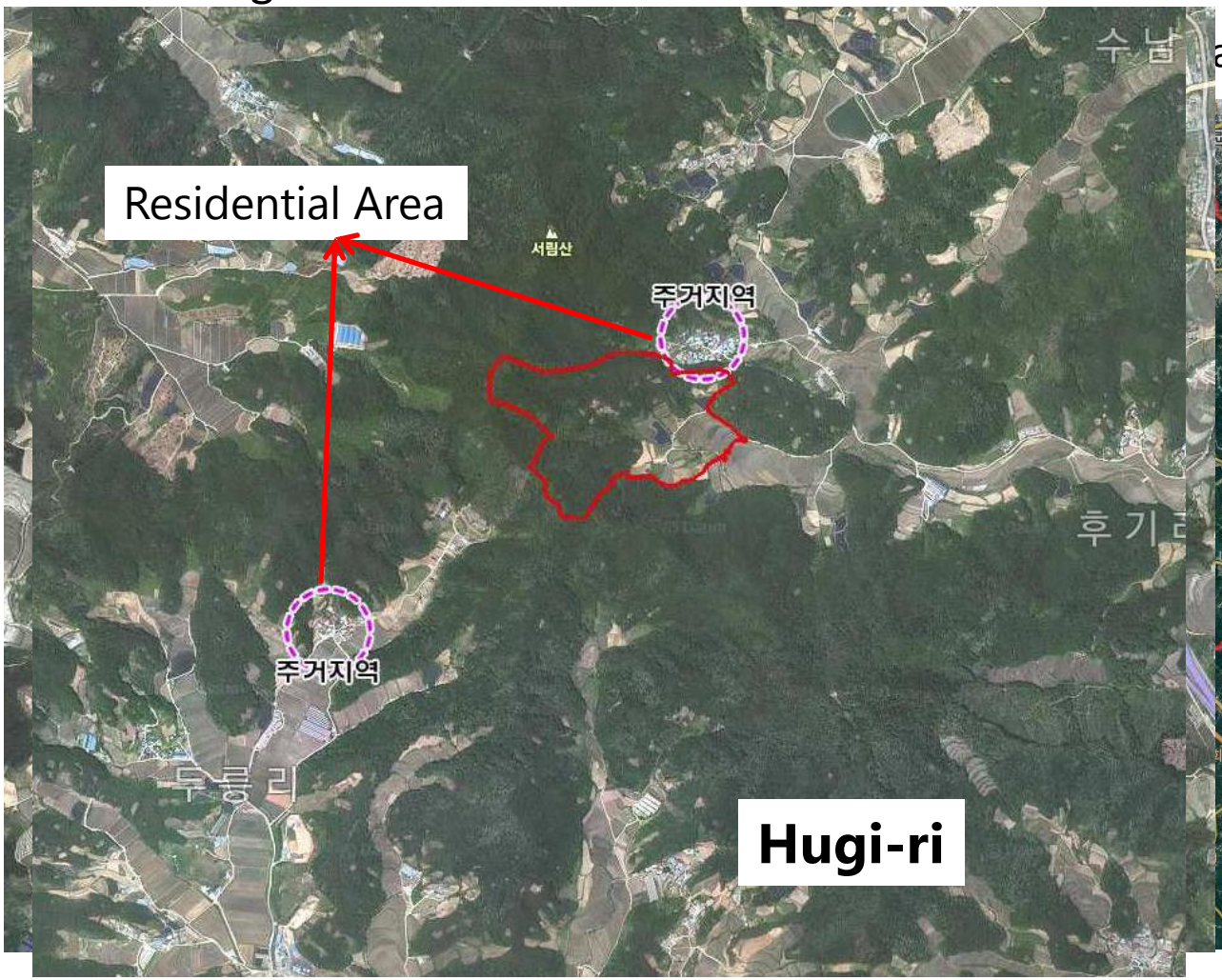
Alternative Comparisons

- SEA in Korea requires to compare Alternatives in several aspects
- 5 kinds of Alternatives in SEA process
  - Planning Comparison: Action vs. No Action
  - Measure·Method: compare several methods to achieve the purpose
  - Demand·Supply: compare different scenarios of demand and supply
  - Site: compare sites and boundaries of selected sites
  - Timing·Order: compare different scenarios of timing and order

- This SEA compares three kinds of alternatives
  - Planning Comparison: Action vs. No Action
  - Site: sin-jeon-dong (agricultural land close to residential) vs. Hugi-ri (forest area remote from residential)
  - Measure·Mehod: Open landfill vs. Roof-closed landfill

Key Features of the Good Practice and its Consequences

- In the planning process, it is required to evaluate the site comprehensively with Siting committee.

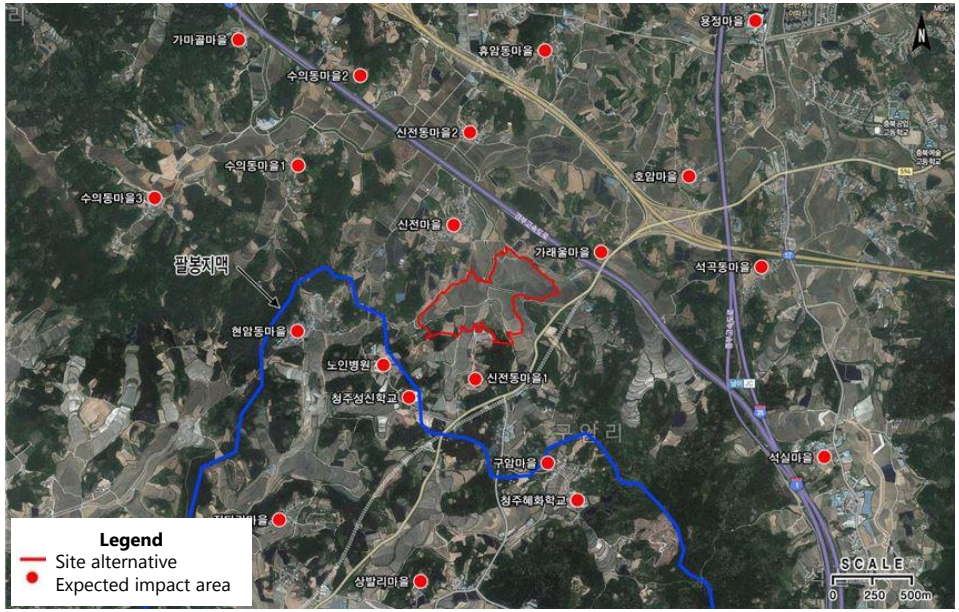


al assessments.

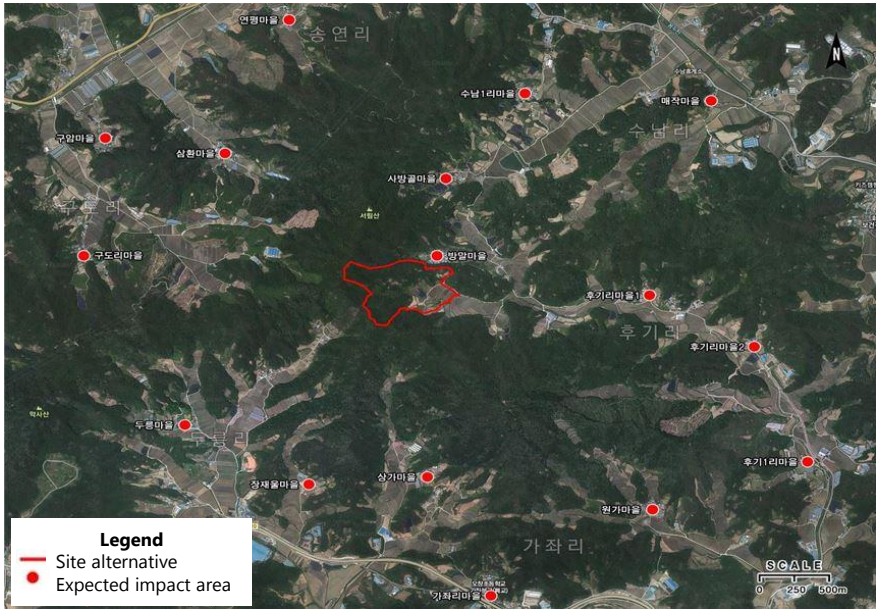
< Cheongju-si >
· Population; 638,663
· Area; 153.87km²

Key Features of the Good Practice and its Consequences

- Acceptability of local residents was assessed in addition to natural environment, living environment.
- Final selected site: Site alternative 2(Hugi-ri)



< Site alternative 1(Sinjeon-dong) >

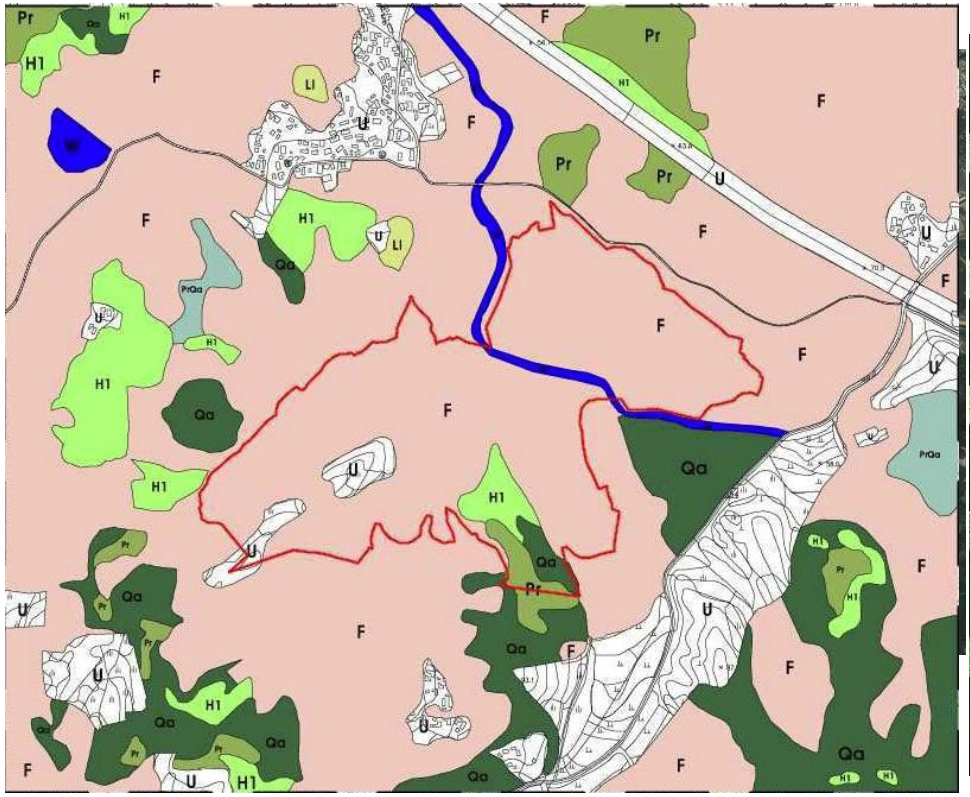


< Site alternative 2(Hugi-ri) >

- A low impact on the natural environment but resident's strong opposition.
- A little resident's opposition
  But, a significant impact on the natural environment

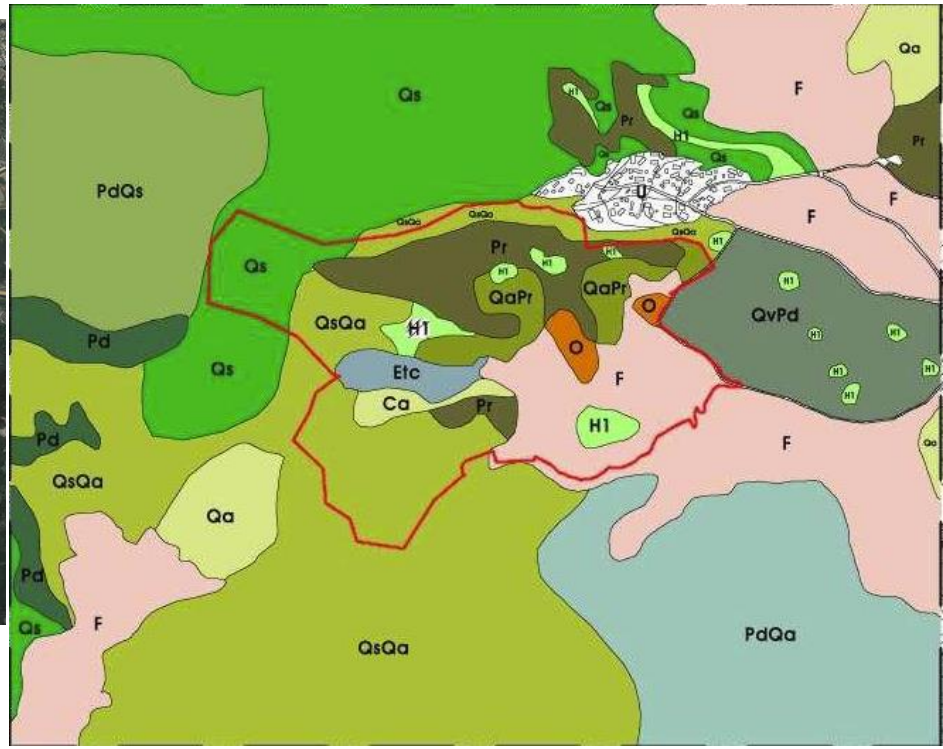
Alternative Comparison of SEA: Natural Environment

- Compare the natural environment of two site alternatives: Land Cover



< Site alternative 1(Sinjeon-dong) >

- Almost all agricultural land (87.6%)
- A low impact on the natural environment



< Site alternative 2(Hugi-ri) >

- 71.7% Forested area
- High impact on natural environment

Alternative Comparison of SEA: Natural Environment

- Compare the natural environment of two site alternatives: Endangered Species

Legend
Site alternative
Expected impact area

< Site alternative 1(Sinjeon-dong) >

- 1 Natural Heritage species
- kestrel, *Falco tinnunculus*

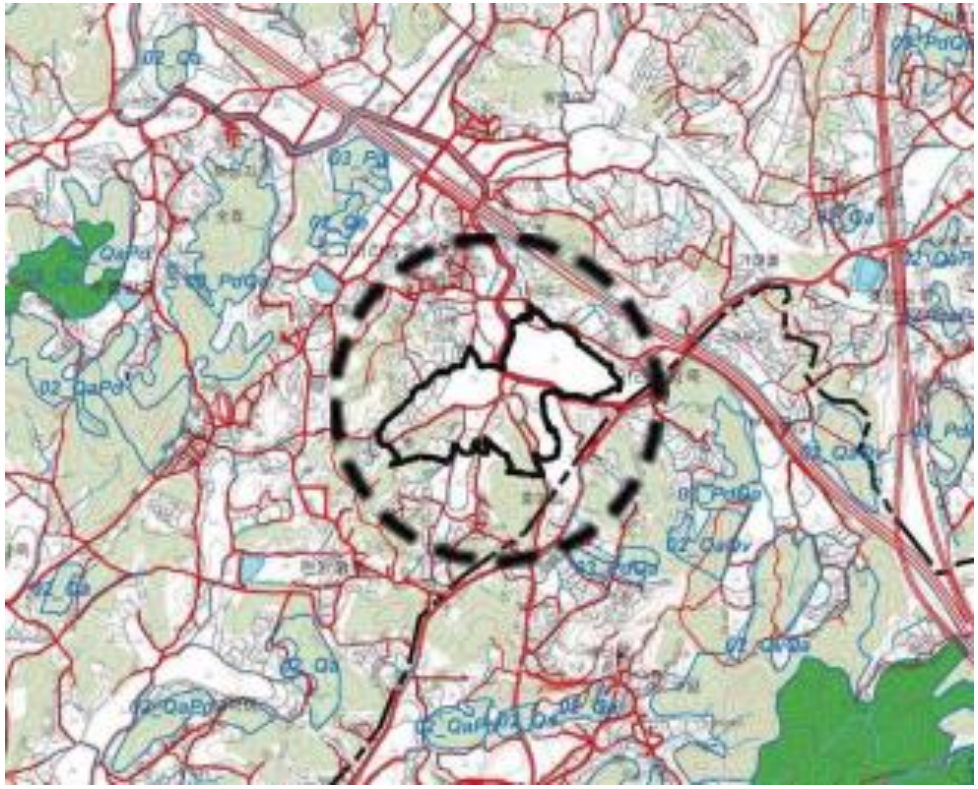
Legend
Site alternative
Expected impact area

< Site alternative 2(Hugi-ri) >

- 2 endangered species
- Sparrowhawk (*Accipiter soloensis*)
- Siberian honey buzzard (*Pernis ptilorhynchus Temminck*)

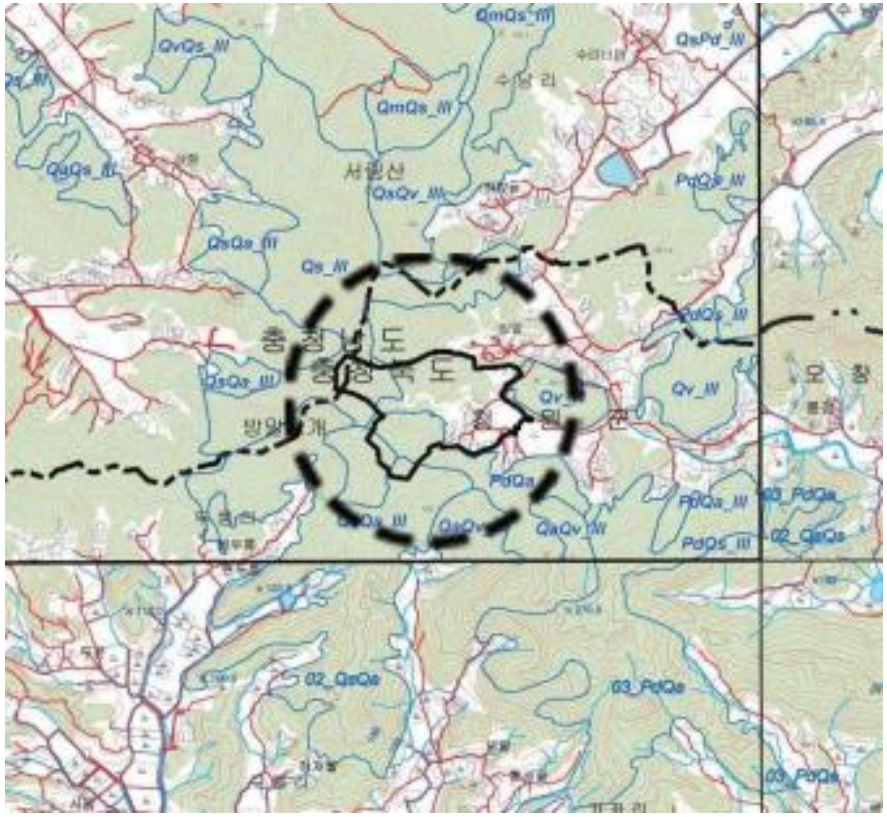
Alternative Comparison of SEA: Natural Environment

- Compare the natural environment of two site alternatives: Eco-Naturalness Map



< Site alternative 1(Sinjeon-dong) >

➢ Only Level 3 (Non-forest) of Eco-Naturalness Map

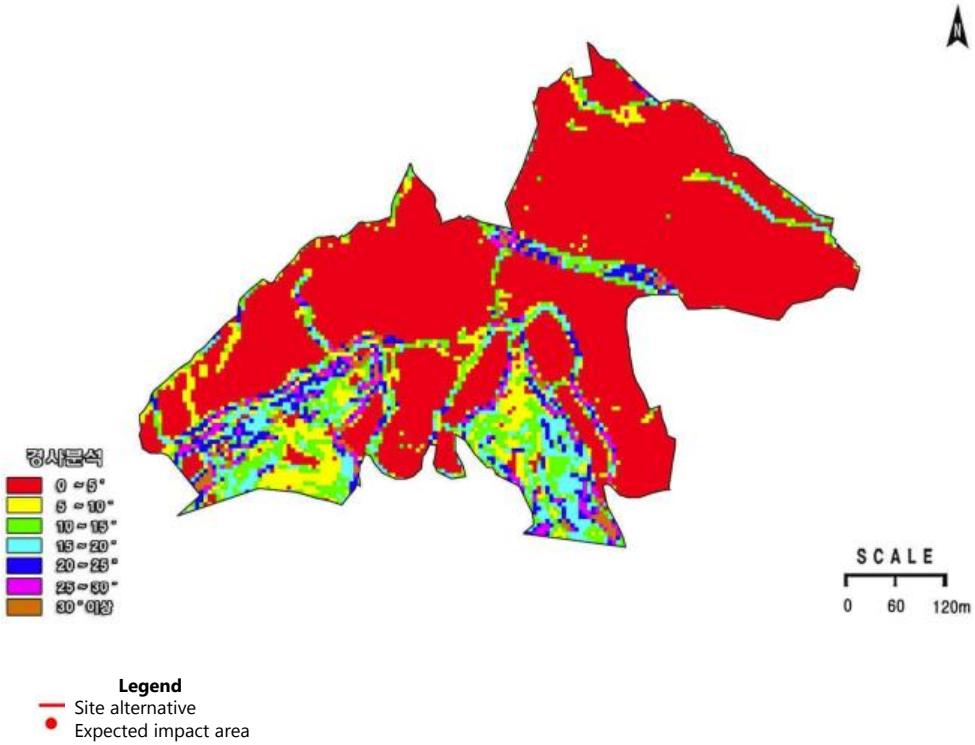


< Site alternative 2(Hugi-ri) >

➢ Mainly Level 2 (Forest) of Eco-Naturalness Map

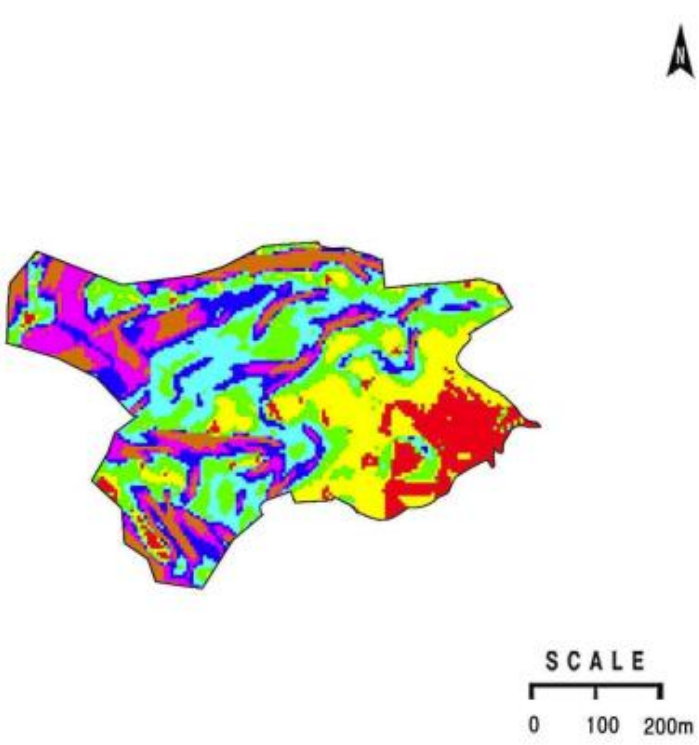
Alternative Comparison of SEA: Natural Environment

- Compare the natural environment of two site alternatives: Land-Form



< **Site alternative 1(Sinjeon-dong)** >

- Relatively flat land form

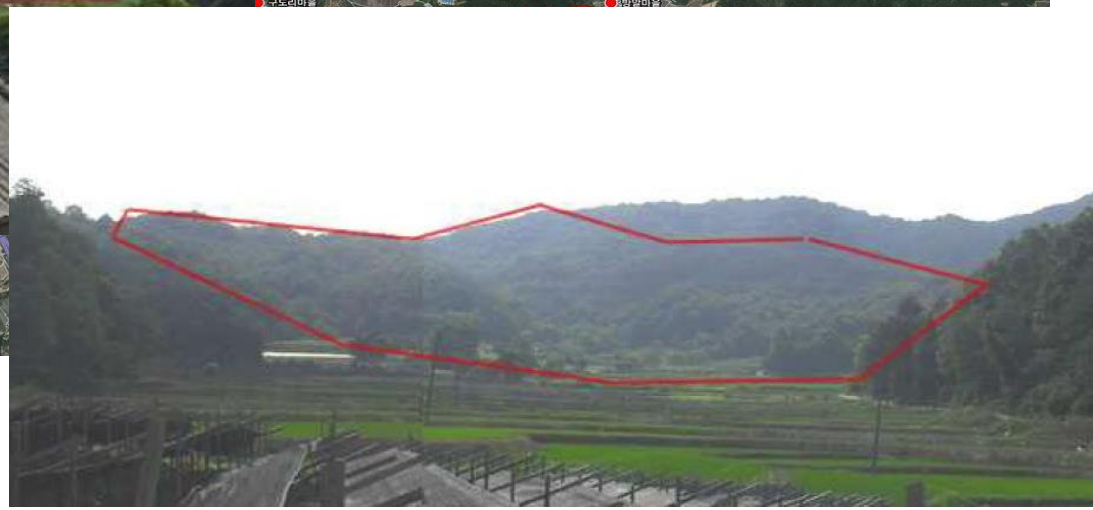


< **Site alternative 2(Hugi-ri)** >

- Steep slope in the left side
- 35.17% above slope 20°

Alternative Comparison of SEA: Natural Environment

- Compare the natural environment of two site alternatives: Landscape



Legend
Site alternative
Expected impact area

< Site alternative 1(Sinjeon-dong) >

- Rather located in open space
- Very wide view points
- High impact on the landscape view

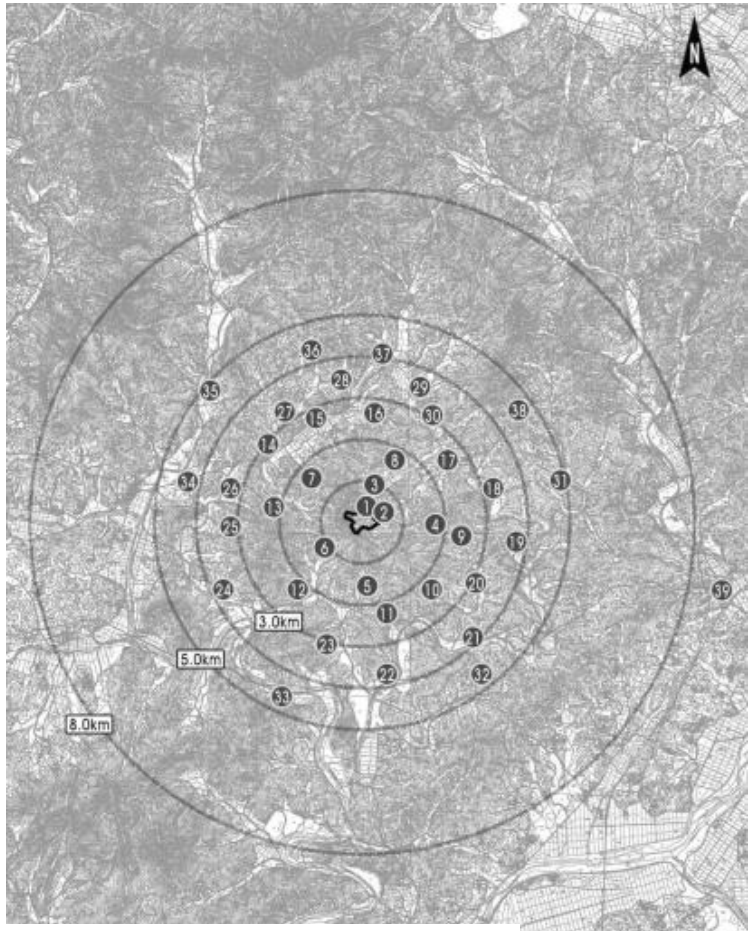
< Site alternative 2(Hugi-ri) >

- Encircled by mountain ridge
- Rather narrow view points
- Low impact on the landscape view

Alternative Comparison of SEA: Odour

- Compare the expected odour impact locations of two site alternatives

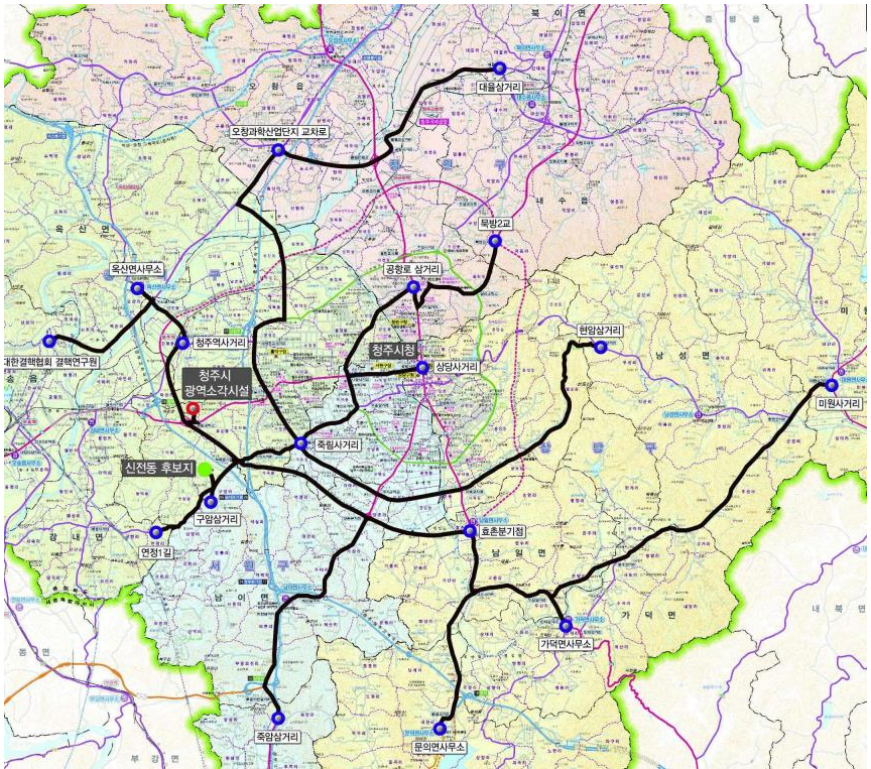
More impacted locations with shorter radius: 5km

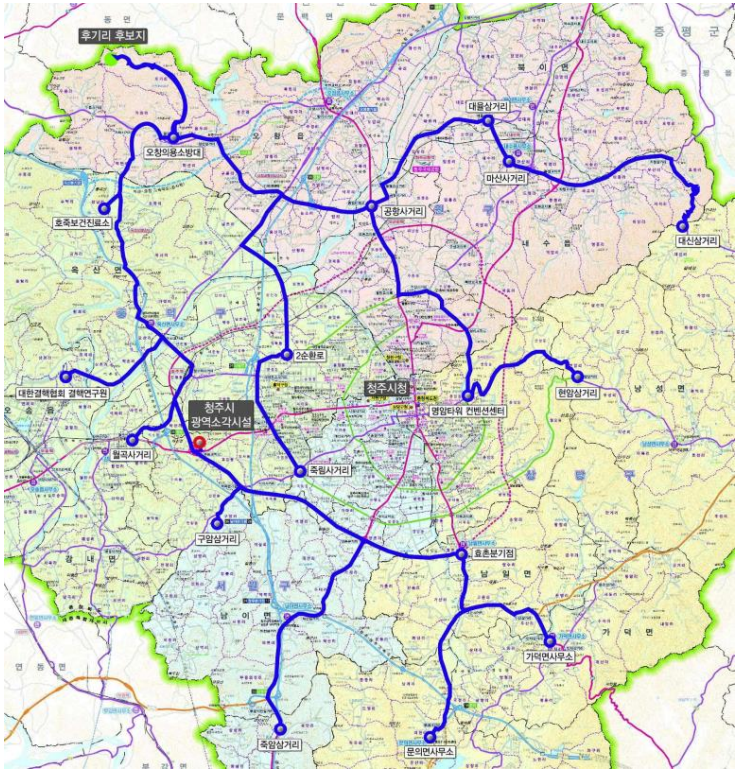


Little impacted locations with longer radius: 8km

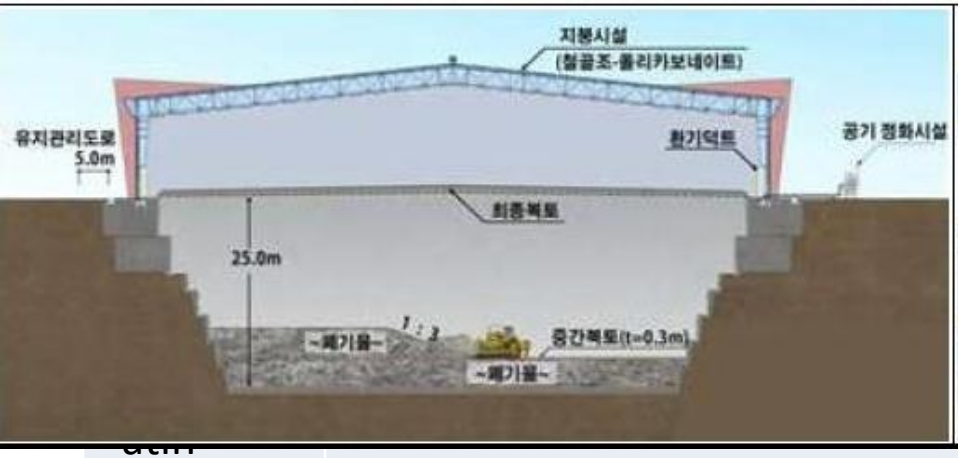
Alternative Comparison of SEA: Odour

- Compare the expected odour effect of two site alternatives
  - Complex odour
  - Ammonia
  - Hydrogen sulfide (H_2S)
- Compare the expected transportation distance
- Mitigation measure: Roof-closed landfill and air-puritication facility





Alternative Comparison of SEA: Odour



No Expected Odour Impacts with mitigation measure

Key Features of the Good Practice and its Consequences

- Cheongju-si comprehensive evaluation Criteria

Evaluation Criteria		Cheongju-si
Landfill general conditions	Landfill capacity	5
	Reclaimed area compared to landfill capacity	5
	Catchment area ratio	4
	Access road	4
	Status of utilities	2
	Subtotal	20
Social conditions	Residential status of surrounding areas and separation distance	6
	Status of land use	5
	Obstruction distribution	5
	Terms of the land contract	5
	Acceptability of resident sand vision	4
	Subtotal	25
Environmental Impact	Visibility(landscape)	5
	Ecosystem	5
	Water quality(Including groundwater)	5
	Stink	5
	Air quality(Including dust)	5
	Noise/Vibration	5
	Subtotal	30

Evaluation Criteria		Cheongju-si
Economics	Ease of construction	6
	Ease of collection and transport of waste	6
	Securement of cover materials	-
	Environmental infrastructure connectivity	4
	Ease of balance facility installation	-
	Disaster possibility	4
	Ex-post environment management	-
	Post-land use plan	-
	Outline of construction cost	5
	Subtotal	25
Total		100

note)

Cheongju-si 2nd landfill evaluation criteria and distribution is proposal. so it can be changed.

Insights & Further Development

1. SEA linked with planning process

- In Strategic Environmental Assessments(SEA),
  It is effective to make a connection with planning process in order to compare the alternatives.
- In 「Act on promoting installation of waste treatment facilities and supporting surrounding areas」, it is required to evaluate the site comprehensively by siting committee.
- Accordingly, Strategic Environmental Assessment(SEA) became effective.

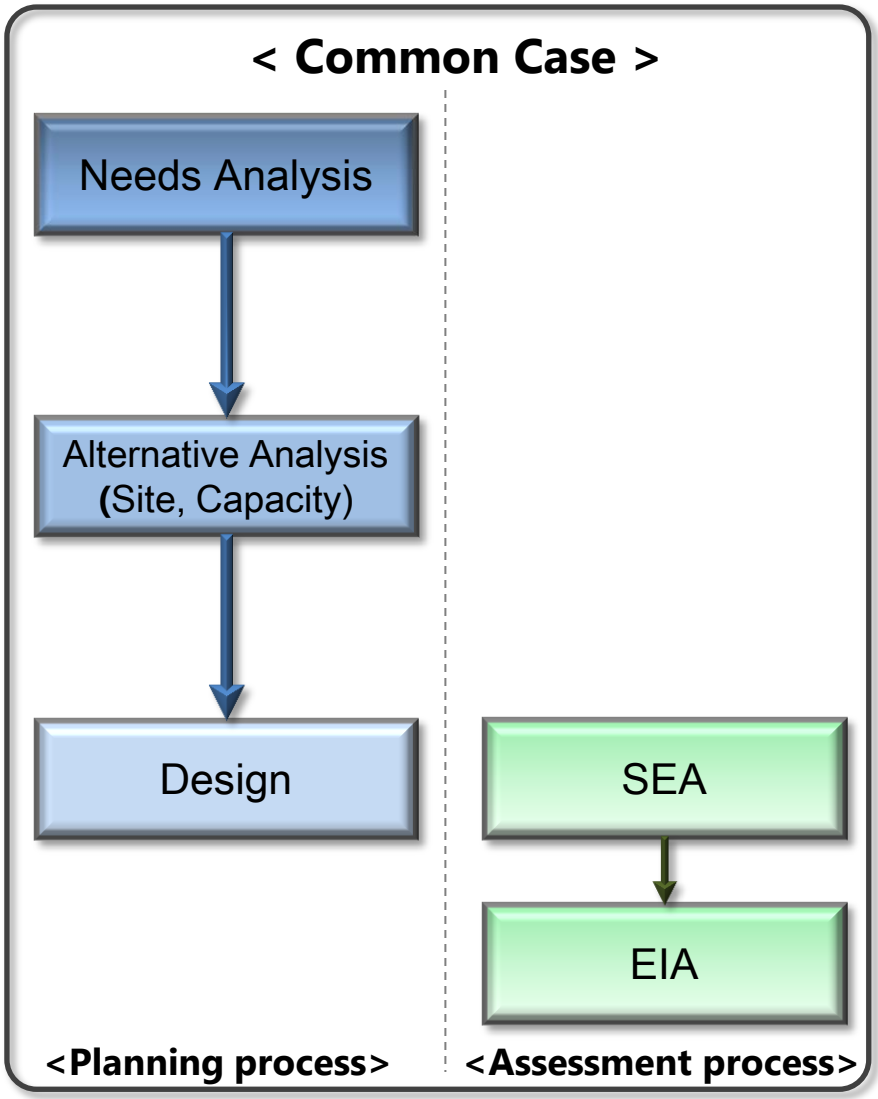
2. Importance of social impact

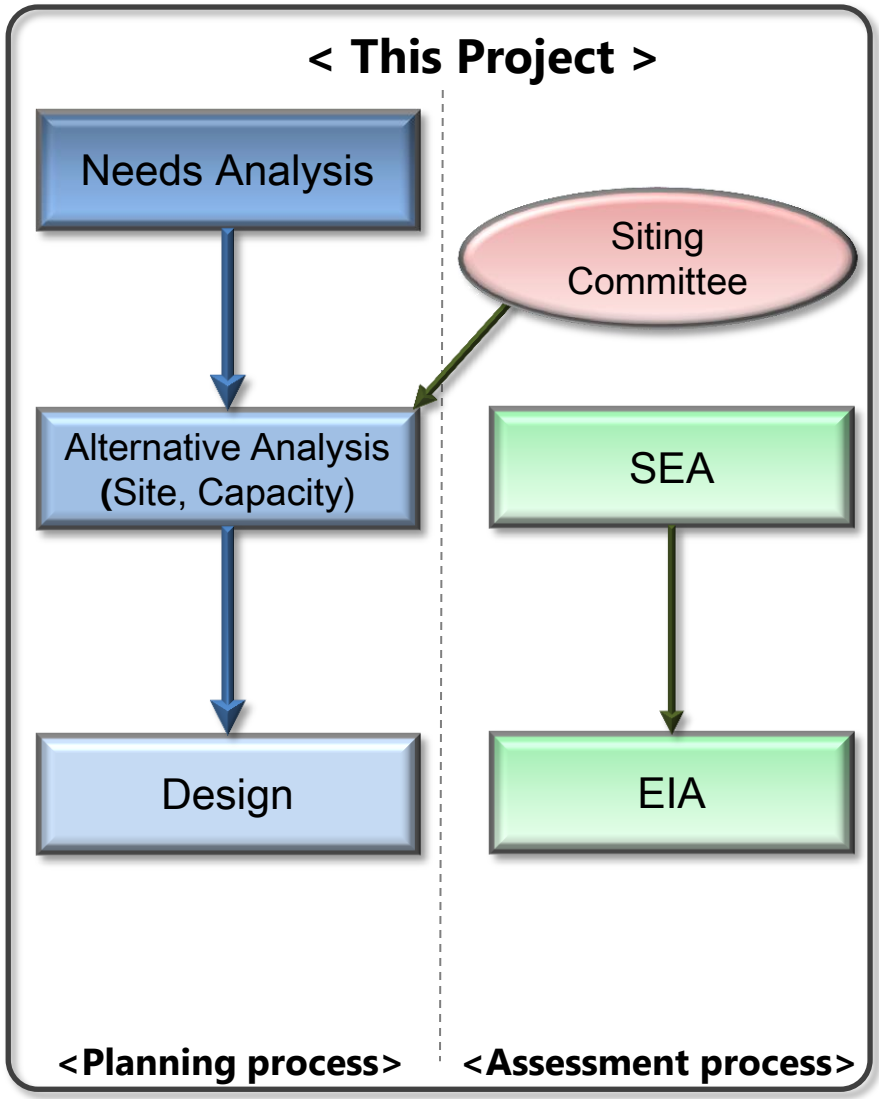
- Compared to other EIA projects in Korea,
  this project includes social conditions such as acceptability of residents.

3. Importance of Alternative Comparisons

- Comparisons of Diverse alternative scenarios : sites, measure·method
- Thorough comparisons of two site alternatives in diverse aspects

Insights & Further Development





Thank You!