Preparing Guidance for Sustainability Decision making

Akiko Urago, Yuki Shibata, Tetsuro Uesugi,
Hiroo Kasagi, Yoshika Yamamoto
Non-essential SDGs efforts

- Unessential SDG actions may ultimately lead to an unsustainable world

Only one item considered

Not considering NetPositive

Small action after the decision

Not looking back past failure

SDGs?
What we get?
What we lost?

- Without looking past and relationship of the items, we cannot plan future.
Which plan do you select?

Plan A
Economy and greenhouse gases are approaching target, but natural resources fall below threshold

Plan B
Natural resources are above threshold but worse than current conditions

Plan C
Approaching target values in all categories.
Why guidance?

Legal system?

Only big projects?
Team

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Former Director of EIA division, Ministry of the Environment

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Associate Professor specializing in EIA

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Private Consultant
Methodology

- Understand sustainability assessment, strategic thinking, and system thinking,
- Understand the decision-making procedures at each level, from national to individual,
- Collect actual case or assume a fictitious case study at each level and think about how it can be integrated into real decision-making procedures,
- Determine the principles of decision-making procedures that are common to all, and
- Summarize the procedures and precautions for consideration at each level as guidance.
Steps used in the guidance

1. Planning
   • Problem Cause Analysis
   • Investigation of related issues
   • Negative spiral
   • Vulnerability
   • Wishes
   • Formulation of alternatives

2. Analysis of issues and alternatives

3. Formulation of assessment criteria

4. Enhancement of alternatives

5. Finalization of assessment evaluation criteria and conditions for approval
   • Evaluate alternatives
   • Add risk measures
   • Add mitigation and enhancement measures
   • Develop final draft plan

6. Monitoring and course correction

7. Continuation of assessment
Prepared example in the guidance

Actual case
- Waste Disposal Plan at Fujimae Tidal Flat ← Introducing today
- Aichi Expo site planning

Fictitious cases
- Should I buy a pain killer for my backache?
- Should the local government expand roads?
- Should the private company build a new factory?
- Where should that community sports club operate toward?
Example 1: Waste Disposal Plan at Fujimae Tidal Flat

1. Planning
2. Analysis of issues and alternatives
3. Formulation of assessment criteria
4. Enhancement of alternatives
5. Finalization of assessment evaluation criteria and conditions for approval
6. Monitoring and course correction
Example 1: Waste Disposal Plan at Fujimae Tidal Flat

Step 1 - Planning

1981  105 ha of **Fujimae Tidal Flat is designated as a waste disposal site** in the port plan

1989  The reclaimed area is reduced from 105 ha to 70 ha.

1989  Nagoya mayoral election. Opposition parties run candidates and make the Fujimae issue a point of contention.

1992  In consideration of preservation of the natural environment, the landfill area is further reduced to 52 ha.

1993  The Nagoya City Land Development Corporation will acquire approximately 118 ha of land.

1993  The landfill area will be further reduced to 46.5 ha and the project implementation will be decided.

1994  The **EIA procedure is initiated**.

Step 2 - Analysis of issues and alternatives

The disposal site will be full in two years.

Population of Nagoya

Waste volume of Nagoya

Land use change 1945-2000 in Shonai river watershed

Town areas are increased from 15% to 38%.

1945
- Forest: 56%
- Farmland: 8%
- Rice field: 20%
- Water: 1%
- Urban areas: 15%

2000
- Forest: 44%
- Farmland: 6%
- Rice field: 10%
- Water: 2%
- Urban areas: 38%


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Remained 5% tidal flood

https://ktgis.net/kjmapw/index.html

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## Flooding risk

<table>
<thead>
<tr>
<th>Year</th>
<th>Flood area (ha)</th>
<th>Affected houses (Aichi)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1957</td>
<td>22,428</td>
<td></td>
</tr>
<tr>
<td>1959</td>
<td>140,569</td>
<td></td>
</tr>
<tr>
<td>1972</td>
<td>574</td>
<td>2,347</td>
</tr>
<tr>
<td>1989</td>
<td>90</td>
<td>655</td>
</tr>
<tr>
<td>1999</td>
<td>11</td>
<td>121</td>
</tr>
</tbody>
</table>

Change in maximum number of shorebirds and plovers

Dunlin (*Calidris alpina*)

Black-bellied plover (*Pluvialis squatarola*)

Bar-tailed Godwit (*Limosa lapponica*)

https://fujimae-higata.jp/nature.html

http://gis.chubu.ac.jp/SBW/events/16_09/kamei.pdf
Decreasing tidal flat

1945 - 82,621 ha
1978 - 53,856 ha
1996 - 49,380 ha

(https://www.env.go.jp/nature/kenen_umi/umi02_3.pdf)
The ebb and flow of tidal flats at high tide and the distribution of shorebirds and plovers (1998/4/28)
Root-cause analysis

- Insufficient disposal capacity
  - Waste is increasing.
    - population increase
  - Inability to reduce waste
  - No potential land sites.
    - Residents oppose onshore waste disposal sites.
  - Not recycled.
    - Garbage is not separated.
    - Lack of recycling facilities
  - increase in land prices
    - Few private recycling companies
  - Insufficient budget for waste administration
Negative spiral

Decline in biodiversity

Disposal of waste into biological habitats with low land value

Decrease in the number of potential disposal sites

Increase in waste volume

Create a new disposal site

Increase in waste disposal costs

Slowdown in recycling activities

Insufficient budget for waste separation and collection

Insufficient budget for waste separation and collection

Increase in land prices

Population increase

Economic activity is the top priority

Decline in biodiversity

Disposal of waste into biological habitats with low land value

Decrease in the number of potential disposal sites

Increase in waste volume

Create a new disposal site

Increase in waste disposal costs

Slowdown in recycling activities

Insufficient budget for waste separation and collection

Insufficient budget for waste separation and collection
# Alternatives

<table>
<thead>
<tr>
<th>Target</th>
<th>Original Plan</th>
<th>Alternative 1</th>
<th>Alternative 2</th>
<th>Alternative 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Landfill the tidal flats and turn them into a disposal site.</td>
<td>Fill mountain valleys to make them disposal sites.</td>
<td>Waste to be used as landfill for offshore airport expansion</td>
<td>Use current disposal site and increase recycling rate</td>
</tr>
</tbody>
</table>
| Activities | • Construction of a weir in a marine area  
• Construction of a disposal site by digging in the weir  
• Construction of an incineration plant next to the tidal flat  
• Incinerate the collected combustible waste and bury the incinerated ash in the disposal site  
• Use the landfill as industrial land | • Construction of a disposal site with a weir at the outlet of the valley  
• Construction of an incineration plant next to the weir  
• Incinerate the collected combustible waste and bury the incinerated ash in the disposal site  
• Use the landfill as industrial land | • Build a weir around the airport  
• Establish a waste disposal site  
• Bring in incinerated ash for landfill  
• Expand the airport | • Enforce waste sorting  
• Sell recyclable waste to recycling companies  
• Incinerate non-recyclable combustibles  
• Bury incinerated ash in current disposal sites |
### Step 3 - Formulation of assessment criteria

<table>
<thead>
<tr>
<th>General Evaluation Criteria</th>
<th>SDGs</th>
<th>Assessment Criteria</th>
</tr>
</thead>
</table>
| **Socio-ecological system integrity** | Goal 6: Clean water and sanitation  
Goal 12: Responsible consumption and production  
Goal 14: Life below water  
Goal 15: Life on land | 1. Are the sites selected in a way that does not impact the ecosystem?  
2. Is the project Nature Positive? |
| **Livelihood sufficiency and opportunity** | Goal 1: No poverty  
Goal 2: Zero hunger  
Goal 3: Good health and well-being  
Goal 4: Quality education  
Goal 5: Gender equality  
Goal 8: Decent work and economic growth  
Goal 10: Reduced inequality  
Goal 16: Peace, justice and strong institutions | 3. Is the organization involved in unfair trade that promotes poverty?  
4. Does the organization provide adequate welfare for its employees, including those with disabilities?  
5. Does the organization have an equal ratio of male and female employees at all ranks?  
6. Is the organization committed to ethical procurement? |
| **Intragenerational/Intergenerational equity** | Goal 9: Industry, Innovation and Infrastructure  
Goal 13: Climate action  
Goal 7: Affordable and clean energy  
8. Are waste treatment processes reducing greenhouse gas emissions?  
9. Are natural resources that are expected to be depleted used in the waste treatment process?  
10. Is waste sorted and recycled?  
11. Is the use of renewable energy sources promoted? |
| **Risk management** | Goal 11: Sustainable cities and communities  
Goal 13: Climate action | 12. Is the proposed site in a location with a high risk of disasters such as flooding, storm surge, earthquakes, fire, etc.?  
13. Are climate change adaptation measures in place? |
| **Capacity building** | Goal 17: Partnership for the goals  
Goal 12: Responsible consumption and production | 14. Is there sufficient information disclosure and communication to the public?  
15. Are there partnerships with other industries such as manufacturing? |
## Trade-off rules

<table>
<thead>
<tr>
<th>Employment</th>
<th>Assessment Criteria</th>
<th>Conflict item</th>
<th>Trade-off rules</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(Equity) 4. Does the organization provide adequate welfare for its employees, including those with disabilities?</td>
<td>(Economy) Generous employee and disabled welfare may lead to budget shortfalls</td>
<td>Benefits should not be cut because of budget shortfalls or deteriorating financial conditions</td>
</tr>
<tr>
<td></td>
<td>(Equity) 5. Does the organization have an equal ratio of male and female employees at all ranks?</td>
<td>(Economy) Increasing the percentage of women could worsen the financial situation of the Local Governments.</td>
<td>Do not reduce the proportion of women in the workforce because of budget shortfalls</td>
</tr>
<tr>
<td>Location</td>
<td>(Disaster) 12. Is the proposed site in a location with a high risk of disasters such as flooding, storm surge, earthquakes, fire, etc.?</td>
<td>(Ecology) Places with no ecological load may increase disaster risk</td>
<td>Ecosystem conservation must not be sacrificed to reduce disaster risk</td>
</tr>
<tr>
<td></td>
<td>(Ecology) 1. Are the sites selected in a way that does not impact the ecosystem?</td>
<td>(Economy) Locations with no ecological impact may have higher land prices, compensation costs, and construction costs</td>
<td>Ecosystem conservation must not be sacrificed to reduce project costs</td>
</tr>
<tr>
<td>Design</td>
<td>(Poverty) 3. Is the organization involved in unfair trade that promotes poverty?</td>
<td>(Economy) Ethical procurement may worsen the work efficiency and financial situation of Local Governments</td>
<td>Ethical procurement should not be avoided because of inefficient operations or budget shortfalls</td>
</tr>
<tr>
<td></td>
<td>(Climate) 13. Are climate change adaptation measures in place?</td>
<td>(Economy) Climate change adaptation may worsen the financial situation of Local Governments</td>
<td>Climate change adaptation should not be avoided because of budget shortfalls</td>
</tr>
<tr>
<td></td>
<td>(Ecology) 2. Is the project Nature Positive?</td>
<td>(Economy) Nature Positive could worsen the financial situation of Local Governments</td>
<td>Nature Positive should not be avoided because of budget shortfalls</td>
</tr>
<tr>
<td>Operation</td>
<td>(Climate) 7. Are climate change adaptation measures in place?</td>
<td>(Economy) Greenhouse gas measures for waste transport and disposal may worsen work efficiency and the financial situation of local governments</td>
<td>Do not avoid GHG emission reductions because of budget shortfalls or inefficiencies</td>
</tr>
<tr>
<td></td>
<td>(Climate) 8. Are waste treatment processes reducing greenhouse gas emissions?</td>
<td>(Economy) Sustainable resource use, recycling, and ethical procurement can lead to worsening work efficiency and financial conditions</td>
<td>Do not avoid sustainable resource use, recycling, and ethical procurement because of budget shortfalls or inefficiencies</td>
</tr>
<tr>
<td>Resources and recycle</td>
<td>(Resources) 9. Are natural resources that are expected to be depleted used in the waste treatment process?</td>
<td>(Economy) Excessive communication with residents hinders the operation of the facility.</td>
<td>Information should not be hidden, even if it may hinder operations.</td>
</tr>
<tr>
<td></td>
<td>(Resources) 11. Is the use of renewable energy sources promoted?</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(Recycle) 10. Is waste sorted and recycled?</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(Poverty) 6. Is the organization committed to ethical procurement?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Communication</td>
<td>(Information) 14. Is there sufficient information disclosure and communication to the public?</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(Partnership) 15. Are there partnerships with other industries such as manufacturing?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
# Selection the alternative

<table>
<thead>
<tr>
<th>Target</th>
<th>Original Plan</th>
<th>Alternative 1</th>
<th>Alternative 2</th>
<th>Alternative 3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Target</strong></td>
<td>Landfill the tidal flats and turn them into a disposal site.</td>
<td>Fill mountain valleys to make them disposal sites.</td>
<td>Waste to be used as landfill for offshore airport expansion</td>
<td>Increase recycling rate and review estimated landfill volume</td>
</tr>
<tr>
<td>Employment</td>
<td>+++</td>
<td>+++</td>
<td>+++</td>
<td>++</td>
</tr>
<tr>
<td>Location</td>
<td>- - -</td>
<td>- - -</td>
<td>++</td>
<td>+++</td>
</tr>
<tr>
<td>Design</td>
<td>- - -</td>
<td>- - -</td>
<td>++</td>
<td>+++</td>
</tr>
<tr>
<td>Operation</td>
<td>- - -</td>
<td>- - -</td>
<td>- - -</td>
<td>+++</td>
</tr>
<tr>
<td>Resource and recycle</td>
<td>- - -</td>
<td>- - -</td>
<td>- - -</td>
<td>+++</td>
</tr>
<tr>
<td>Communication</td>
<td>++</td>
<td>++</td>
<td>++</td>
<td>+++</td>
</tr>
</tbody>
</table>
## Step 4 - Enhancement of alternatives

<table>
<thead>
<tr>
<th>Activities</th>
<th>Negative impact</th>
<th>Mitigation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sell recyclable waste to recycling companies</td>
<td>Reduced volume of citizens bringing directly to private recyclers, which may reduce profits for recyclers.</td>
<td>The government pays private recyclers for recyclable waste at a discount, while the government supports the introduction of new technologies by private recyclers.</td>
</tr>
<tr>
<td>Incinerate non-recyclable combustibles</td>
<td>Greenhouse gas emissions.</td>
<td>Planting to increase the amount of greenery in the city by 5% each year to promote absorption of greenhouse gases by plants.</td>
</tr>
<tr>
<td>Landfill incinerated ash at a disposal site</td>
<td>Dust damage and water pollution from leachate may occur in the vicinity of landfill sites</td>
<td>A buffer zone with trees will be provided around the landfill site, and if contamination is found in the leachate, a temporary storage reservoir will be installed.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Activity</th>
<th>Positive impact</th>
<th>Enhancement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sell recyclable waste to recycling companies</td>
<td>Recycling industry becomes more active</td>
<td>Government supports companies that use recycled resources as raw materials</td>
</tr>
</tbody>
</table>

**Created assuming SA is applied**
Positive spiral

- Supporting waste sorting
- Supporting waste recycle factories
- Supporting the recycling technology development

Sorting and collection gets back on track

Recycling industry is revitalized.

Lower relative prices for recycled resources

More companies using recycled resources

Prices of natural resources will rise.
Step 5 - Finalization of assessment evaluation criteria and conditions for approval

<table>
<thead>
<tr>
<th>Assessment Criteria</th>
<th>Trade-off rules</th>
<th>risk management rules</th>
<th>Indicator</th>
<th>Conditions of Approval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Employment</td>
<td>[Equity] 4. Does the organization provide adequate welfare for its employees, including those with disabilities?</td>
<td>Benefits should not be cut because of budget shortfalls or deteriorating financial conditions</td>
<td>Hearing satisfaction rate</td>
<td>More than 60%</td>
</tr>
<tr>
<td>Location</td>
<td>[Equity] 5. Does the organization have an equal ratio of male and female employees at all ranks?</td>
<td>Do not reduce the proportion of women in the workforce because of budget shortfalls</td>
<td>percentage of women</td>
<td>More than 40%</td>
</tr>
<tr>
<td>[Disaster] 12. Is the proposed site in a location with a high risk of disasters such as flooding, storm surge, earthquakes, fire, etc.?</td>
<td>Ecosystem conservation must not be sacrificed to reduce disaster risk</td>
<td>Select a location based on the assumption of damage in the event of collapse or flooding.</td>
<td>Risk evaluation by Hazard map</td>
<td>Low risk</td>
</tr>
<tr>
<td>[Ecology] 1. Are the sites selected in a way that does not impact the ecosystem?</td>
<td>Ecosystem conservation must not be sacrificed to reduce project costs</td>
<td>Conduct biological surveys during the site selection phase.</td>
<td>Biological monitoring</td>
<td>Local ecological cores, buffers and corridors to be avoided</td>
</tr>
<tr>
<td>Design</td>
<td>[Poverty] 3. Is the organization involved in unfair trade that promotes poverty?</td>
<td>Ethical procurement should not be avoided because of inefficient operations or budget shortfalls</td>
<td>Carefully investigate procurement channels from the design stage.</td>
<td>Environment report</td>
</tr>
<tr>
<td>[Climate] 13. Are climate change adaptation measures in place?</td>
<td>Climate change adaptation should not be avoided because of budget shortfalls</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>[Ecology] 2. Is the project Nature Positive?</td>
<td>Nature Positive should not be avoided because of budget shortfalls</td>
<td>Make payments to outside contractors based on results</td>
<td>Expanding green area</td>
<td>More than 10%</td>
</tr>
<tr>
<td>Operation</td>
<td>[Climate] 7. Are climate change adaptation measures in place?</td>
<td>Do not avoid GHG emission reductions because of budget shortfalls or inefficiencies</td>
<td>Establish relay collection points for transportation to shorten the total transportation distance.</td>
<td>Greenhouse Gas Emissions reducing rate</td>
</tr>
<tr>
<td>[Climate] 8. Are waste treatment processes reducing greenhouse gas emissions?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Resource and recycle</td>
<td>[Resources] 9. Are natural resources that are expected to be depleted used in the waste treatment process?</td>
<td>Do not avoid sustainable resource use, recycling, and ethical procurement because of budget shortfalls or inefficiency</td>
<td>Develop a target image of sustainable resource recycling and a clear strategy to move forward toward that goal.</td>
<td>Natural resource utilization rate</td>
</tr>
<tr>
<td>[Resources] 11. Is the use of renewable energy sources promoted?</td>
<td></td>
<td></td>
<td>Renewable Energy Utilization Rate</td>
<td>More than 10%</td>
</tr>
<tr>
<td>[Recycle] 10. Is waste sorted and recycled?</td>
<td></td>
<td></td>
<td>Recycling rate</td>
<td>More than 30%</td>
</tr>
<tr>
<td>[Poverty] 6. Is the organization committed to ethical procurement?</td>
<td></td>
<td></td>
<td>Ethical procurement rate</td>
<td>More than 30%</td>
</tr>
<tr>
<td>Communication</td>
<td>[Information] 14. Is there sufficient information disclosure and communication to the public?</td>
<td>Information should not be hidden, even if it may hinder operations.</td>
<td>Establish a system where the more information disclosed, the more benefits are gained.</td>
<td>Disclosure rate</td>
</tr>
</tbody>
</table>

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Actual result of the project

1998  **EIA report** is submitted.

1998  Application for **Reclamation of publicly owned water surface** is filed.

1999  Mayor of Nagoya City announced **abandonment of the project**.

1999  Mayor of Nagoya City announced **Declaration of Waste Emergency**.


NGO, IAIA and Ministry of Environment Japan played an important role.
New Rules for Sorting Garbage in Nagoya
Decreasing waste

![Graph showing decreasing waste volume over time. The graph includes data for waste volume, non-combustible landfill, and incinerated ash landfill. There is a declaration of waste emergency highlighted in a text box.](https://www.city.nagoya.jp/shisei/category/67-5-9-45-0-0-0-0-0.html)
Fujimae-Higata

Country: Japan
Site number: 1200
Area: 323 ha
Designation date: 18-11-2002
Coordinates: 35°04’N 136°49’E

Fujimae-Higata. 14/10/02; Aichi; 323 ha; 35°04’N 136°50’E. A tidal flat at the mouths of the Shonai, Shinkawa, and Nikko rivers as they flow into the port city of Nagoya. The site is an important staging site along the East Asia-Australia Flyway with one of the highest shorebird counts in Japan - some seven species of shorebird surpass the 1% threshold in the area, and more than 20,000 waterbirds have been counted frequently. The wetland is also visited by a number of endangered species, including the birds Tringa guttifer, Botaurus stellaris stellaris, Tadorna tadorna, and Sterna albifrons sinensis, among others, and the endangered fish Chaenogobius macrognathos. Once part of extensive tidal flats in the northern part of Ise Bay, the site remains relatively unaltered itself amid widespread
Preparing guidance for sustainability decision making
Step 6: Monitoring and feedback

Dunlin (*Calidris alpina*)

Black-bellied plover (*Pluvialis squatarola*)

Bar-tailed Godwit (*Limosa lapponica*)

Only stopping one project cannot preserve tidal ecosystem

https://fujimae-higata.jp/nature.html

http://gis.chubu.ac.jp/SBW/events/16_09/kamei.pdf
Important points

- Point 1: Face the negative consequences caused by one's past actions
- Point 2: Recognize what was sacrificed and what was prioritized
- Point 3: Do not stick to direct negative impact used in EIA
- Point 4: Keep explore the alternative which clear all conditions
- Point 5: Use a Positive spiral with psychological devices
Can we lead?

Evaluated biological data ➔ Raw data

Project base data ➔ Area base census

Monitoring report ➔ Spatial information database

Consultant ➔ Citizen
Thank you

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