Developing practices for supporting EIA with Multi-Criteria Decision Analysis (MCDA)

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"Improving environmental assessment by adopting good practices and tools of MCDA"

This presentation: "Opportunities of MCDA to support EIA"
Premises of the IMPERIA Project

Practitioners

Need to improve consistency and transparency of EIA

MCDA Experts

Structured approach of MCDA
Structured view with MCDA model

Facts + Values
Traditional holistic comparison

Criteria: Price, color, speed, ...
## Structured analysis of MCDA

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Price</th>
<th>Color</th>
<th>Speed</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$35k</td>
<td>Good</td>
<td>150mph</td>
</tr>
<tr>
<td></td>
<td>$25k</td>
<td>Bad</td>
<td>100mph</td>
</tr>
<tr>
<td></td>
<td>$30k</td>
<td>Very good</td>
<td>130mph</td>
</tr>
<tr>
<td>Overall Score</td>
<td>93</td>
<td>87</td>
<td>96</td>
</tr>
</tbody>
</table>
Advantages of MCDA

- Learning of the problem
- Systematic structuring of objectives
- Identification of trade-offs of different stakeholders
- Transparent assessment of alternatives
- Accommodation of incommensurable effects
MCDA in short...

Divide and conquer
Various MCDA tools available to support EIA process

- Influence diagrams
- Consequence table
- Decision trees
- Objectives hierarchy
- Impact significance criteria
- Value tree analysis
Opportunities of MCDA to support EIA

Potential areas of MCDA identified in IMPERIA:

1. Initial scoping of the impacts
2. Impact significance assessment
3. Stakeholder participation
4. Evaluation of alternatives
1. Support for initial scoping of the impacts with objectives hierarchy

Wind power example

Impacts to be assessed

Impacts to nature
- Birds
- Other fauna
- Flora
- Natura 2000
- Water bodies
- Ground and bedrock

Impacts to human well-being
- Health values
- Recreational activities
- Community economy

Impacts to societal objectives and land use
- Cultural environment
- CC mitigation objectives
- Land use
- Image
2. Support for impact significance assessment

“How large impact is significant?”
Structured MCDA framework for impact significance assessment

Impact significance

- Impact characteristics
  - Magnitude
  - Spatial extent
  - Duration
  - Legal requirements
  - Generic criteria
  - Public interest

Importance of the target area
**IMPERIA tool for impact significance assessment**

<table>
<thead>
<tr>
<th>Impacts on nature</th>
<th>Overall estimate</th>
<th>Suggestion</th>
<th>Direction</th>
<th>Estimate</th>
<th>Suggestion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Birds</td>
<td>- Small</td>
<td>- Small</td>
<td>▼</td>
<td>- Small</td>
<td>▼</td>
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<tr>
<td>Local</td>
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<tr>
<td>Migratory</td>
<td></td>
<td></td>
<td>▼</td>
<td>▼</td>
<td>▼</td>
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<tr>
<td>Mammals</td>
<td>-- Medium</td>
<td>-- Medium</td>
<td>▼</td>
<td>-- Large</td>
<td>▼</td>
</tr>
<tr>
<td>Game</td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>Other</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Plants</td>
<td>- Small</td>
<td>- Small</td>
<td>▼</td>
<td>- Small</td>
<td>▼</td>
</tr>
<tr>
<td>Natura 2000</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>
3. Support for participating stakeholders

Pure expert assessment

Field studies
"Objective"

Models

Experiences
"Subjective"

Opinions

Initial expert assessment

Final assessment of impact significance
Stakeholder participation framework

Assessment with stakeholder participation

Field studies "Objective"

Models

Experiences "Subjective"

Opinions

Initial expert assessment

Stakeholder groups’ assessment

Final assessment of impact significance
IMPERIA tool for stakeholder participation
4. Support for the evaluation of the alternatives

“How good are the alternatives as a whole?”
IMPERIA MCDA tool for the evaluation of the alternatives
Conclusions

Keywords of MCDA for supporting EIA:

- Structured
- Consistent
- Transparent
- Justified

Encouraging initial experiences from the IMPERIA project

Next step: Put all this in practice!