



Sustainable Development and road winter service

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Terms Of Reference (from PIARC Strategic Plan 2007-2011)

Issue B.5.2 - Provide sustainable winter service

Strategy:

Study of the full slate of social (safety) environmental and economic (cost/benefit) aspects required to achieve "sustainability" in winter maintenance

Output:

Identification of what optimum sustainability means in term of winter maintenance and strategies to achieve it

Keywords: ***Sustainable Development – Winter Service***



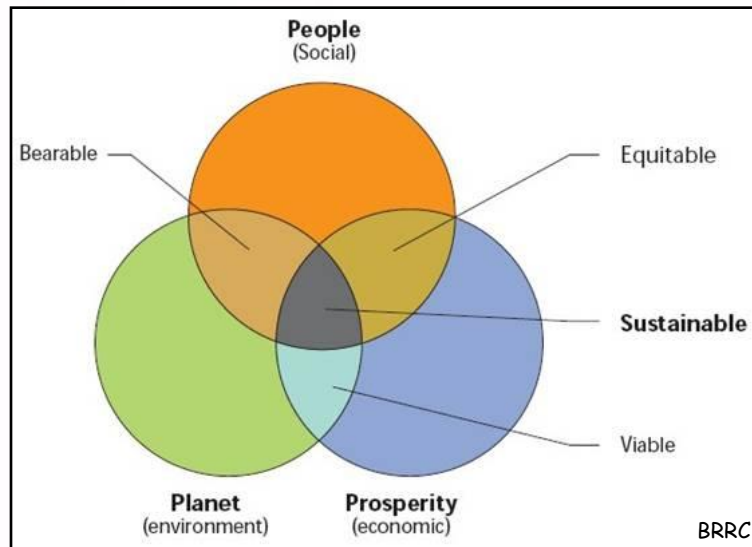
Definition

“Sustainable development meets the needs of the present without compromising the ability of future generations to meet their own needs” (from Brundtland report “Our common future”, 1987)



Objective

Objective: to define (and transpose) the SD concept in the framework of the winter service.



Requires appropriate and measurable indicators, that can be interpreted unambiguously.



Concrete and effective implementation, adapted to practical applications



Method

- Review some Sustainable Development assessment methods relevant for a further application to the winter service
- Review the main social, environmental and economic aspects required to achieve 'sustainability' in winter maintenance
- Propose a basis for the future development of a dedicated methodology by defining sustainable objectives, indicators (or criteria) and parameters relevant to winter service activities



Consecutive Steps

1. Sourcing information

- Review of the existing approaches, methodologies (Source: bibliography)
- Identify any interesting initiatives, practices, strategies (Source: B5 members, seminar, congress)

2. Methods adaptation (Source: B5 members)

- Identify the more important and relevant social, environmental and economical factors to provide a sustainable winter service;
- Propose a first analytical evaluation tool based on a set of relevant (sub-)criteria as basis for the future development of a dedicated method.

3. Perspectives (Still in development; Resource: B5 members)

Ideas for future work & Recommendations



Sourcing information

Existing methodologies, initiatives: bibliographic review:

- Global methods & tools
 - Check-lists
 - Life Cycle Analysis
 - Qualitative certification method
- Thematic evaluation tools
 - e.g. related to CO₂ or GHG emissions; to Winter Maintenance activities



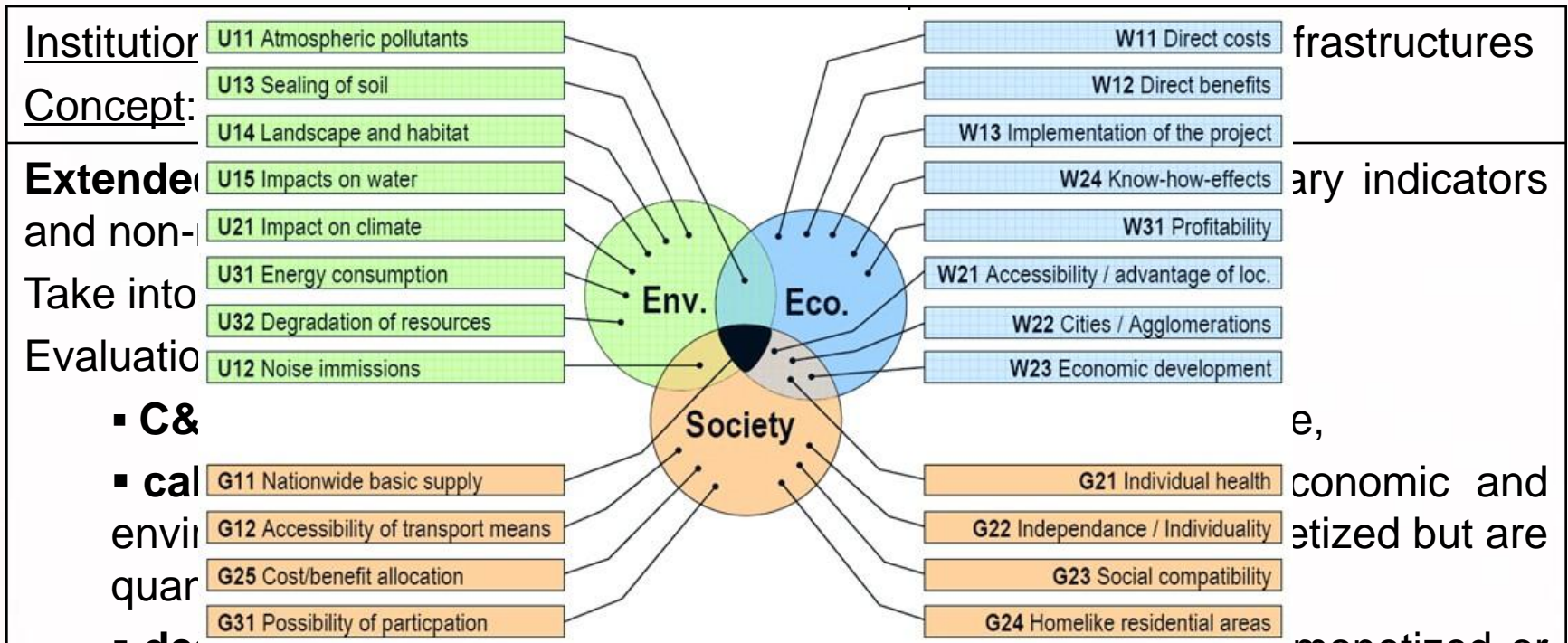
Existing methodologies, initiatives - 1

Descriptive Check-list (example of the grid RST02):

<p><u>Institution</u>: CETE, Certu (F) <u>Concept</u>: checklist - tool for decision makers</p>	<p><u>For use in</u>: Road infrastructures (initially for urban land use planning)</p>	
<p>Qualitative rating for each of the 29 criteria. Basically the user need to answer the question: “was the criteria X “Not” / ”Badly” / “On average”/ “Relatively well” / “Well” taken into account in the project?” A question guide and a list of recommendations are provided to help to make an appropriate evaluation</p>		
<p><u>Criteria</u> (7. Bearable Interface)</p> <p>7.1. Living environment</p>	<p><u>Question guide</u></p> <p>Does the project improve the living environment of the inhabitants?</p>	<p><u>Recommendation</u></p> <ul style="list-style-type: none"> - Reduce noise, odour and aesthetic nuisances - Correct the defects in appearance that could jeopardize the living environment - Diversify the green spaces and their modes of management - Improve the quality of use and user comfort
<p>Question guide and recommendation used to evaluate a project following a criteria (example)</p>		

Existing methodologies, initiatives - 2

Qualitative certification method (example the evaluation tool eNISTRA):



NISTRA - Sustainability Indicators for Road Infrastructure Projects (CH): a tool to evaluate road projects from the sustainability perspective – Sub-Goals overview



Existing methodologies, initiatives - 3

Thematic evaluation tools (example of HA Carbon Calculation Methodology):

Institution: Highways Agency (UK)

For use in: Road infrastructures

Concept: calculation tool (C, CHG)

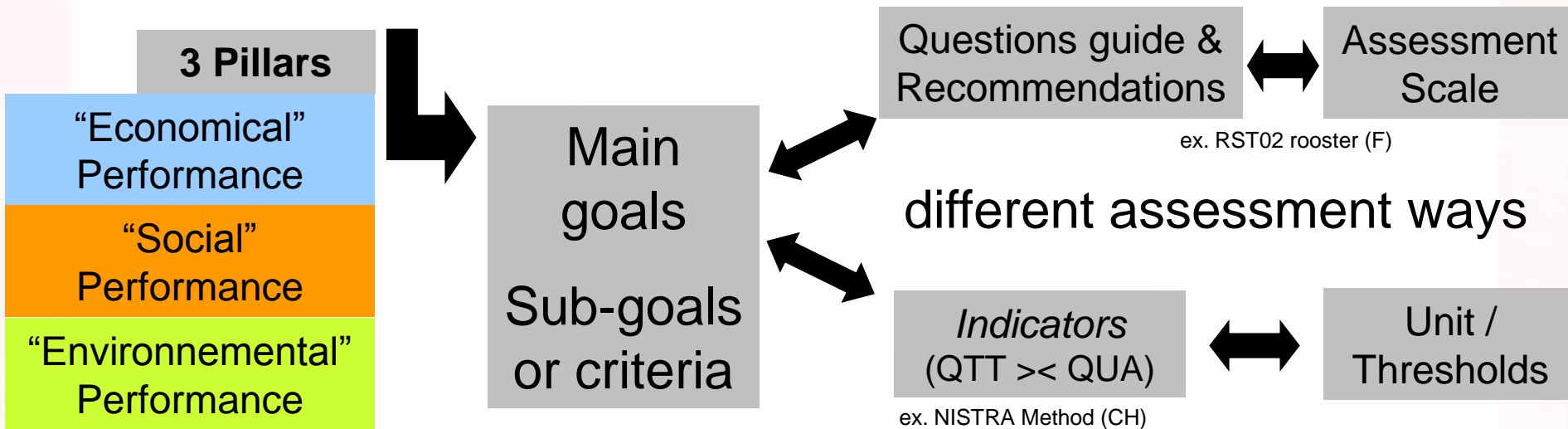
- Tool provides a means of capturing the **volume of carbon produced through construction, maintenance and operational activities** undertaken by the Highways Agency, and its contractors and supply chain.
- The Calculation Tool also provides a **reporting mechanism** for the ongoing calculation of carbon and GHG emissions.
- Comprehensive and relevant tool:
 - assesses each project with precision;
 - takes into account the maintenance and operational activities



Sourcing information

Conclusion

Broad variation in the existing Sustainable Development assessment methods but ...



Methods adaptation - 1

Important and relevant social, environmental and economical factors to provide a sustainable winter service

Draft set of evaluation criteria

Pillars	Evaluation criteria
Society	Culture
	Accessibility & Public utility
	Safety & Security
	Participation of all actors, social integration
Environment	Soil
	Water
	Atmosphere
	Biodiversity
	Energy
	Waste management
Economy	Landscape
	Direct costs
	Indirect costs
	Cost/Benefits ratio
	Life cycle costs

Methods adaptation - 2

Relation between the pillar, the evaluation criteria, the sub-criteria (evaluation question) and the recommendations - Example

Pillar	Evaluation Criteria	Evaluation questions	Recommendations / Actions

ENVIRONMENT (Env)	Atmosphere	Does the WS strategy prevent or mitigate the impact of WS actions on air pollution?	Propose an environmental management plan considering all air pollutant sources (ploughing, spreading, logistics, fleet emissions). Set-up (and train about) guidelines about the right use of equipment, buildings. Favorize material supply from less polluting logistical means. Develop environmental indicators. Support eco-driving.
		Does the WS strategy prevent or mitigate noise impact of WS actions on the road and operationnal center surroundings?	Propose a noise management plan; such plan should consider all winter maintenance related activities (including ploughing, spreading, logistical activities). Set-up (and train about) guidelines about the right use of equipment. Favorize low-noise equipment. Develop noise indicators.

Methods adaptation - 3

First analytical evaluation tool based on a set of relevant (sub-)criteria

Important to consider:

- Homogeneity and independence of the evaluation criteria;
- Flexible matrix open to further development;
- Flexibility through the use of a weighting factor system

Last developements:

- Matrix implemented into a spreadsheet;
- Implementation of a simple weighting factor system (through survey within TC.B5)



First analytical evaluation tool based on a set of relevant (sub-)criteria

Example: Pillar “SOCIAL (Soc)” - Evaluation Criteria “Safety & Security” (Soc3)

Id_SC.		Evaluation questions (Sub-criteria)	Evaluation scale (1= not taken into account; 5= well taken into account) - Example
Soc3.1	Does the WS ensure a proper access to & from security and rescue services areas?	4	
Soc3.2	Does the WS ensure acceptable driveability conditions for individuals on roads in winter?	1	
Soc3.3	Does the WS strategy take account of the management of specific traffic circumstances/events?	3	
Soc3.4	Does the WS take the staff safety and health into account?	3	
Soc3.5	Does the WS ensure safe operation of plowing/spreading fleet in respect of other traffic participants?	2	
Soc3.6	...		



First analytical evaluation tool based on a set of relevant (sub-)criteria

Example: Pillar “SOCIAL (Soc)” - Evaluation Criteria “Safety & Security” (Soc3) – Sub-criteria Soc3.4

Evaluation scale
(1= not taken into account, 5= well taken into account)

Recommendations / Actions

Prepare a plan for and promote winter maintenance staff safety and health; including staff training. Ensure compliance to safety standards. Make use of ergonomic equipment, tools and installations. Make use of harmless materials and promote use of individual protection means.

Soc3.1	Does the WS ensure services areas?	
Soc3.2	Does the WS ensure a on roads in winter?	
Soc3.3	Does the WS strategy, traffic circumstances/events?	3
Soc3.4	Does the WS take the staff safety and health into account?	
Soc3.5	Does the WS ensure safe operation of plowing/spreading fleet in respect of other traffic participants?	2
Soc3.6	...	

Evaluation questions (Sub-criteria)



First analytical evaluation tool based on a set of relevant (sub-)criteria

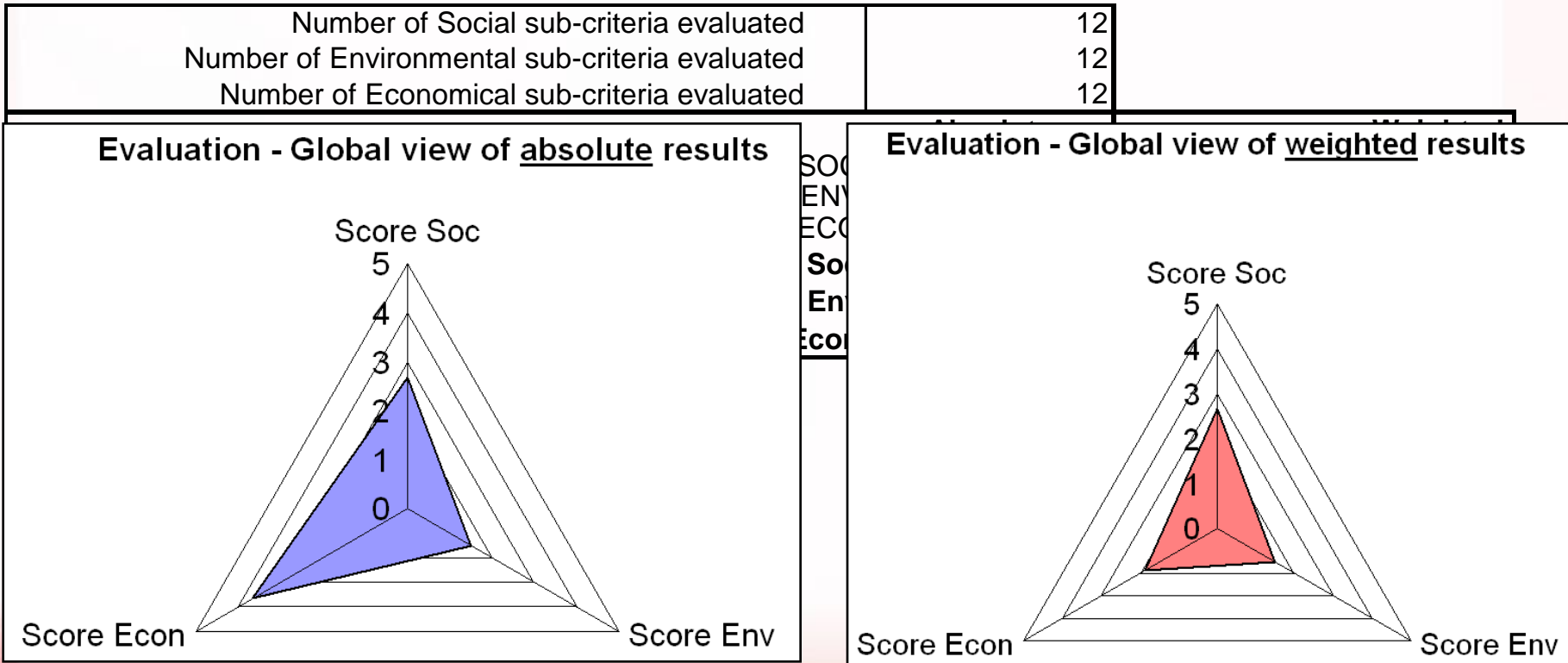
Example: Pillar “SOCIAL (Soc)” - Evaluation Criteria “Safety & Security” (Soc3)

Evaluation questions (Sub-criteria)	Evaluation scale (1= not taken into account; 5= well taken into account) - <u>Example</u>	Weighing factor (1=low importance; 5=great importance) - <u>Values suggested by TCB5</u>	Individual score
Does the WS ensure a proper access to & from security and rescue services areas ?	4	5	4
Does the WS ensure acceptable driveability conditions for individuals on roads in winter ?	1	5	1
Does the WS strategy take account of the management of specific traffic circumstances/events ?	3	5	3
Does the WS take the staff safety and health into account?	3	5	3
Does the WS ensure safe operation of plowing/spreading fleet in respect of other traffic participants?	2	5	2
...			



First analytical evaluation tool based on a set of relevant (sub-)criteria

Evaluation results – Global view (illustration)



Conclusion & Perspectives

- Evaluation matrix proposed:
 - 1st attempt to transpose the SD concept in the framework of the road winter service activities;
 - not based on measurable indicators yet but already relevant;
- “Recommendations/Actions”: refers to good WS practices → “abstract” SD concept linked to practical and concrete measures
- Starting point for further research and development aiming a more quantitative evaluation tool



Thank you for your kind attention

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