SPeAR – Tool Summary

Authors

Name	Organisation	Origin
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Info

Date:
June 2000; version 9 in 2006

Place of origin:
London, United Kingdom

Homepage:
http://www.arup.com/Services/Sustainability_Consulting.aspx

References:

- Hart, D., 2009. An Interdisciplinary Approach to Enhancing Sustainable Development Teaching in the Higher Education Built Environment Curriculum: Learning from a Curriculum Development Project at the University of Sheffield. Reflecting Education, 5(1), 31-50.
- McGregor, A. & Roberts, C., 2003. Using the SPeAR TM Assessment Tool in Sustainable Master Planning. In Proceedings of US Green Building Conference. Pittsburgh, USA: USGBC.
- Ove Arup & Partners Ltd, 2006. Nirah - SPeAR Assessment, London, UK: Ove Arup & Partners Ltd.

Latest use:
2009 - http://www.arup.com/Projects/Changxindian_Low_Carbon_Community.aspx

Download:
http://www.oasys-software.com/information/universities.shtml (academic version, 9.0.5.3)

Description

“SPeAR stands for Sustainable Project Appraisal Routine and it is a program for Sustainable Project Appraisal. It has a standard template, which can be tailored to suit different project appraisals. It produces the graphic output representing the summary of the appraisal…”
“The Sustainable Project Appraisal Routine (SPeAR®) is based on a four-quadrant model that structures the issues of sustainability into a robust framework, from which an appraisal of performance can be undertaken.
SPeAR® brings sustainability into the decision-making process with its focus on the key elements of environmental protection, social equity, economic viability and efficient use of natural resources.
As such the information generated by the appraisal prompts innovative thinking and informs decision-making at all stages of design and development.“
“SPeAR® contains a set of core sectors and indicators that have been derived from the literature on sustainability.
The software is however capable of including indicators that reflect the context and scope of the project and so create a bespoke appraisal.
The appraisal is based on the performance of each indicator against a scale of best and worst cases.
Each indicator scenario is aggregated into the relevant sector and the average performance of each sector is then transferred onto the SPeAR® diagram.”

"The main aims in developing SPeAR have been to:"

- Devise a robust and practical methodology;
- Optimise all sustainable issues for a project;
- Illustrate the interaction of indicators to changes;
- Provide a graphical illustration of the output, via the 'SPeAR diagram';
- Assess the 'sustainability' of a project at various stages of its development at a point in time;
- Provide design and/or management information to allow informed decision making."

Uses of the tool:

- Comparison of different sites, processes, products and policies;
- Assessment of alternative design;
- Continual monitoring of performance;
- Providing management information to aid decision making by identifying strengths and weaknesses;
- Providing auditable information for planning process, consultation or PR;
- Assessing the sustainability of planning policies and strategies;
- Encouraging Best Practice and prompting sustainable thinking.

Advantages:

- At the early stages of site selection to provide a framework for the environmental review/ Scoping exercise;
- Early stages of option selection for any type of project;
- For identifying a project's weaknesses and strengths and to optimise issues;
- During Value Management/Value Engineering meetings;
- As an awareness raising tool in public consultation or training tool at stages throughout a project such as through workshops etc;
- To demonstrate the evolution of a project over time as the design develops or as alternative strategies are developed;
- To demonstrate to top management why investment is needed in specific initiatives;
- As support to planning applications;
- To inform decision-makers at all stages of development and operation, enabling continual improvement in sustainability performance.

Limitations:

- Open to misuse/bias;
- Involves a thinking process of a team not an individual;
- Needs a diverse skills base team, many experts can be subjective, one person should co-ordinate and capture the balance and increase objectivity;
- Oversimplification;
- Key indicators could be lost;
- Comparisons can only be made within a project not between different projects due to the specificity of indicators;
- Not an answer to sustainability, rather a tool to guide a step change towards sustainability.

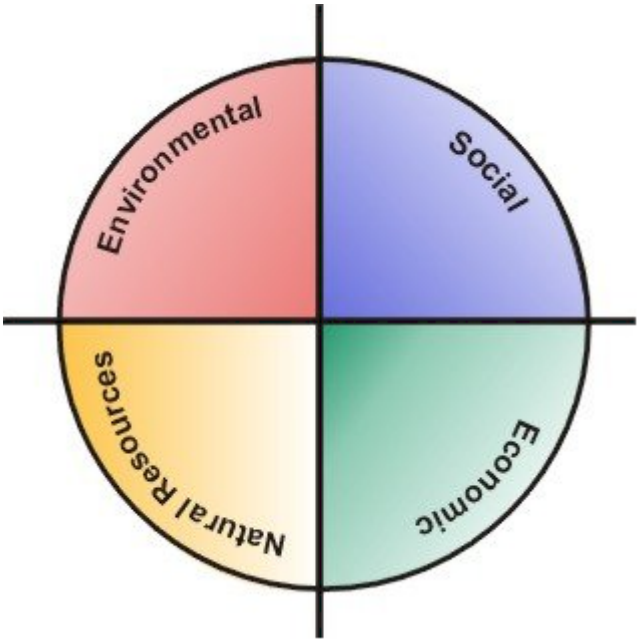
Key Theoretical Background

- DETR, Quality of Life Counts, 1999
- DETR, Planning for Sustainable Development – Towards Better Practice, 1999.
- DETR, Urban White Paper, 2001.
- United Nations, Indicators of Sustainable Development Framework and Methodologies, 1996
- Urban Task Force, Towards an Urban Renaissance, 1999.
- World Commission on Environment and Development, Our common future ('The Brundtland Report'), 1987.

Also looked into various other lists of indicators, from the EU for example.

SUD Framework

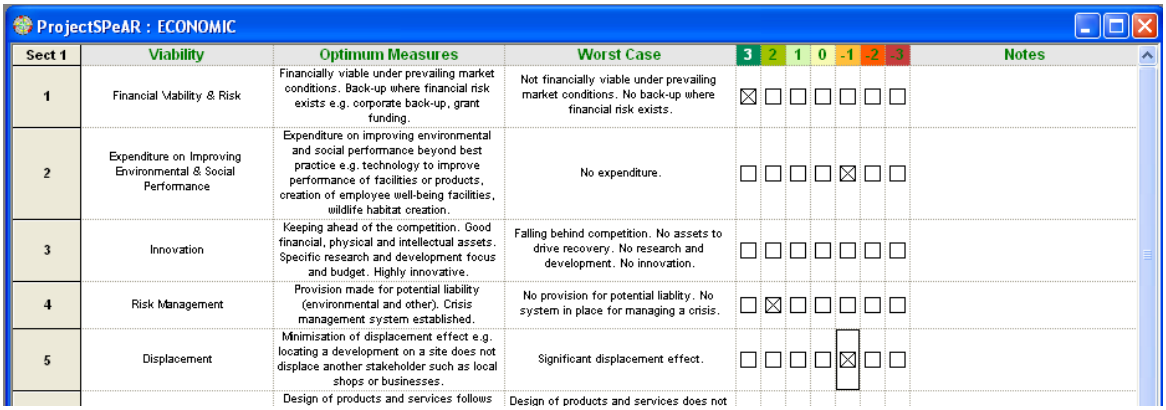
Four quadrant model:



1. environmental protection;
2. social equity;
3. economic vitality;
4. natural resources efficiency of use.

Input

Each indicator will be rated in a scale of -3 to 3, with additional notes for justification.



Sect 1	Viability	Optimum Measures	Worst Case	3	2	1	0	-1	-2	-3	Notes
1	Financial Viability & Risk	Financially viable under prevailing market conditions. Back-up where financial risk exists e.g. corporate back-up, grant funding.	Not financially viable under prevailing market conditions. No back-up where financial risk exists.	☒	☐	☐	☐	☐	☐	☐	
2	Expenditure on Improving Environmental & Social Performance	Expenditure on improving environmental and social performance beyond best practice e.g. technology to improve performance of facilities or products, creation of employee well-being facilities, wildlife habitat creation.	No expenditure.	☐	☐	☐	☐	☒	☐	☐	
3	Innovation	Keeping ahead of the competition. Good financial, physical and intellectual assets. Specific research and development focus and budget. Highly innovative.	Falling behind competition. No assets to drive recovery. No research and development. No innovation.	☐	☐	☐	☐	☐	☐	☐	
4	Risk Management	Provision made for potential liability (environmental and other). Crisis management system established.	No provision for potential liability. No system in place for managing a crisis.	☐	☒	☐	☐	☐	☐	☐	
5	Displacement	Minimisation of displacement effect e.g. locating a development on a site does not displace another stakeholder such as local shops or businesses.	Significant displacement effect.	☐	☐	☐	☐	☒	☐	☐	
		Design of products and services follows	Design of products and services does not								

Up to 10% of the indicators can be customised for the specific project; this is a recommendation to keep a certain consistency between appraisals as it facilitates the comparison of project.

The user can add new “sectors” (criteria) and indicators - 10 for the new and 3 for the existing sectors.
It’s not necessary to use every indicator, as long as it is not relevant to the project. The original sectors and indicators cannot be deleted.

Methods

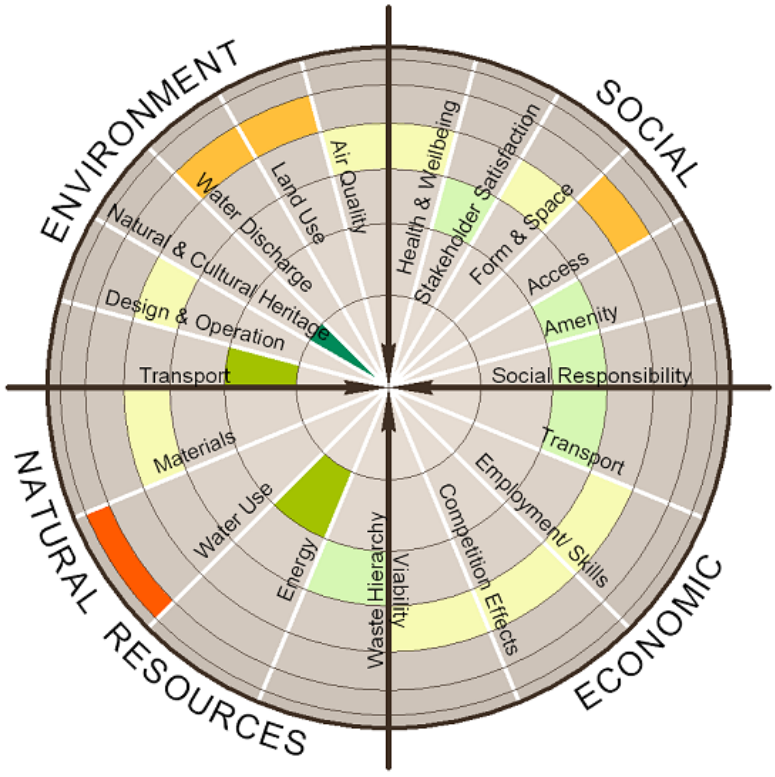
There are no specific computational or analytic methods suggested for rating the different indicators. The tool is designed to be used by a certified SPeAR Operator in a workshop scenario with a team of experts involved in the project, and specifically **not** to be used by a single individual. These are the steps in an appraisal process:

Step 1 understanding the issues
Step 2 Identify stakeholder
Step 3 Indicator review
Step 4 Data collation
Step 5 Workshops
Step 6 Undertake appraisal
Step 7 Agree appraisal
Step 8 Complete appraisal
Step 9 SPeAR report

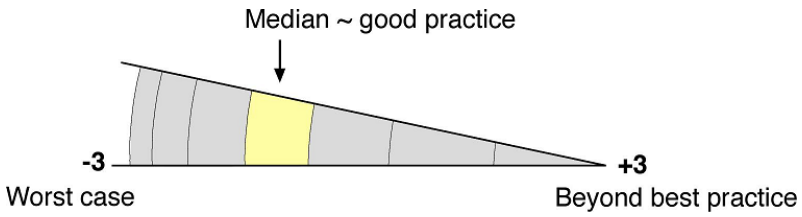
The rating is qualitative, translated from knowledge or quantitative data of the various experts, and added in the notes field of each indicator to justify the rating. A SPeAR manager is the only person qualified to review the appraisal and report, and provide the final certification.
All indicators represent the performance of the project as a whole.

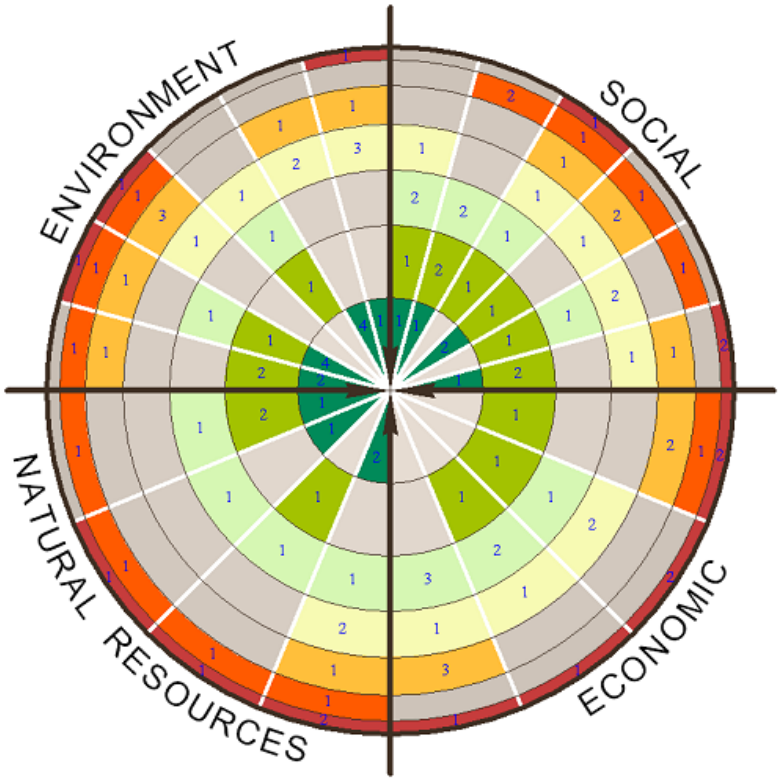
Output

A spreadsheet report with the rating of each indicator and the SPeAR diagram to visualise at sustainability criteria level the strenghts and weaknesses of the project.



Average scores view.





All scores view.

SPeAR – Tool Review

General

Application (Scale and Design Phase)

The system is very generic and can be used on various types of projects and scales. However that means that there's a high degree of adaptation required to make it work for the urban design scale and during a design phase. This tool is intended for the use by a design team during the development process, which has to define sustainability criteria and indicators and provide their ratings, and there's no scope to set benchmark values and weights. It is not suitable for integration in a semi- or fully-automated evaluation process.

Sustainability Principles

The sustainability framework extends the traditional three dimensions by separating environment and resource use, the impacts and requirements of the development respectively. In the context of urban design it is interesting because it distinguishes and gives equal importance to the more qualitative environmental aspects that relate to urban form and infrastructure, and the energy aspects related to building and infrastructure technology. Often the environmental dimension of sustainability is addressed exclusively by the accountancy of energy and materials, which are more tangible aspects. However there is no reference to support this split.

Assessment Criteria

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There are some criteria related to the development process, the running and management of the project and site, and the monitoring of the satisfaction. These are hardly applicable in the urban design phase, but can be interesting to consider these broader topics and see how they might influence the decisions by the design team.

The selected criteria don't match a single sustainability dimension and there are overlaps and synergies expected in the evaluation of such a complex system. But the final output requires a clear split between the four quadrants. The solution here is the duplication of the criterion heading (like transport) but this might raise some confusion. Not sure…

Indicators and Methods

Less than half of the indicators are directly suitable for the type of development scale and phase of urban design, despite the 10% retention requirement in the documentation. Many might have to be rephrased to be meaningful in this context.

The tool doesn't have specific indicators, it has a huge list of assessment criteria open to consideration and debate. In the manual we find a series of questions to be answered for each criteria, however these questions are not part of the tool itself. These are just examples of the type of concerns that should be addressed in each assessment criteria. Again the team of experts will decide which ones are relevant.

As a consequence, the tool cannot suggest methods or calculations for determining the rating of the various indicators. Neither are benchmarks given, it is expected that the experts in the different topics will define these for the specific project and translate the evaluation of the solution into the 7 point scale of the tool.

The appraisal of each indicator is given for the project as a whole, in this case the neighbourhood or site. For designers this only gives the general direction of the project, but doesn't pinpoint critical areas for intervention. However, the individual expert's reports and assessment methods used might provide more detailed information that get's aggregated at site level.

Output

The tool doesn't provide a single rating of the project in the end and only aggregates the indicators at the level of 20 sustainability criteria by simple average. This is not intended as a

measure of performance as that would require at least the setting of weights for the different indicators and criteria. This is simply intended as a basis for discussion and guidance for decision during the development process.
Alternatively, each criterion is represented by the number of indicators at each level, from -3 to 3 in an even more disaggregate format.
The graphic output is a well designed and easy to understand radar graph displaying the average for each criterion, or the number of indicators at each rating level. This output is a useful summary for qualitative discussion and comparison of different solutions, as it gives a quick overview of the project.
By default, there is no spatial representation of the indicator's performance