

QUICKScan

Introduction

Conceptual framework

The QUICKScan software and QUICKScan tool (<http://QUICKScan.pro>) encompasses a modelling environment with functionalities to assess societal and environmental conditions, diagnose patterns and interactions, implement alternative responses and evaluate the impacts of those responses. The QUICKScan modelling environment enables the linkage of GIS data to qualitative and/or quantitative rules and allows the user to identify not only the direct, but also the indirect, impacts of spatial strategies. It enables analyses of causes; the user can dynamically and interactively adapt the strategies and/or rules to reach a desired state. The QUICKScan framework addresses five questions (after Winograd 2007):

1. What aspects are relevant with respect to ecosystems and human well-being?
2. What typical 'pictures' of the past and current condition exist and what are the trends?
3. What elements and interactions are relevant for the persistence of these patterns, trends and impacts?
4. Which strategies and options can be devised to preserve, restore, use, improve, mitigate, or adapt?
5. Which hotspot areas, services or land covers could be identified as targets for policy actions?

General application of QUICKScan

QUICKScan is an empty modelling shell which needs to be filled on a case by case basis with GIS data, qualitative and/or quantitative rules, and map algebra. The tool is not restricted to a specific geographic location or spatial resolution; similar to word processing software (e.g. Microsoft Word) which is not restricted to a specific document (type). The system enables the definition of 'if..then..else' rules and links those to available data to create derived data. Typically the rules use quantitative classifications or qualitative typologies to help define the situation and options for change (Verweij et al. 2012). Rules may also be linked together to form a chain of rules. Alternative (chains of) rules are used to capture different options. Derived data from alternatives can be aggregated (e.g. by administrative units, or biophysical units such as catchments or climatic zones) to be displayed in tables and charts for overviews (see Figure 1 and <http://quicksan.pro/features.html>).



Figure 1. Collection of screenshots of the QUICKScan tool, showing its project library (1), rule definition (2), combinational workflow (3), and resulting maps and graphs (4).

Keywords

Participatory approach; Spatial approach; Modelling framework; Explore options/scenarios.

Why would I chose this approach?

The QUICKScan methodology is based on the use of an approach and a software tool that is applied in group processes with policy-makers and experts to develop and explore potential policy options and assess likely impacts of those options (Figure 1). A typical QUICKScan application is developed in three main steps:

1. Explore data related to the (policy) context: The system is populated with maps and statistics that the participants in a decision meeting find relevant to the policy question. The toolbox enables the data to be stored and described in an organised way, so that it can be viewed and compared in a clear way with users. This is usually done by the facilitators before a group session starts. During the workshop the maps and statistics are viewed and explained.
2. Design options and build workflows: Assess the impact of (jointly) defined policy options by defining 'if... then... else' expert rules. Expert rules can be quantitative and/or qualitative and are linked together to form a chain of rules. The tool will apply these rules to the maps and statistics creating indicators that show the likely impacts of the policy options.
3. Evaluate and iterate results: The derived data/indicators can be aggregated (e.g. by administrative or biophysical units) and displayed in tables, charts (including spider diagrams to show trade-offs) and maps. The aim is to help the decision-makers and experts compare the impacts of different options, identify hotspots areas or issues and assess the trade-offs or alternatives. Often certain locations in the generated maps represent unexpected or puzzling results. The QUICKScan trace-feature lets the user trace back from

the output maps to the applied rules. This is visualised by displaying the causal relationships between all used rules and GIS data resulting in the map and highlighting the decision path in each of the rules as applied for the location of interest. This helps to either explain the result or allows iterative fine-tuning of the rules. If needed iterations with new rules or for new options and alternatives can then be implemented.

What are the main advantages of the approach?

- QUICKScan is spatially-explicit.
- It can easily combine and handle a wide variety of different spatial data and knowledge rules.
- It has an open model structure with a direct response to all the implemented expert knowledge rules. This is often highly valued and seen as a possible future advance for more in-depth modelling approaches, e.g. the ease to test and trace back expert knowledge could not be replicated with current known standard GIS software without a lot of extra effort. The transparency of QUICKScan enables the easy transformation of the captured knowledge into other systems if/once this is judged feasible and desirable.
- It allows for the explicit and transparent implementation of all the calculation steps and knowledge rules required for addressing the impact of measures on ES and costs.
- It supports the use of Python for map algebra if this is required. The Python code can potentially be re-used in other programs or modules, if desirable at a later stage.

What are the constraints/limitations of the approach?

- Limited to spatially-explicit issues.
- No system dynamics, no feedback loops.
- Currently restricted to use with ArcGIS 10.0.
- It is developed for, and mainly used in, (relatively) short and participatory workshops. However, the tool can be deployed as an additional desktop tool alongside existing GIS software programs. For many basic GIS functionalities, QUICKScan cannot be compared with the performances of commercially available GIS packages. It is questionable if a (pure) desktop application of QUICKScan is therefore of much added value.
- Defining solid causal relations to express final output indicators, related to the available spatial and temporal data, can be a complex and quite difficult task. Since the focus is often more on developing a proof of concept than to approximate the absolute truth, there are certainly many uncertainties in the finally used knowledge rules. When further implementation is required, a debate is needed as to what extent absolute numbers can be used and when a more relative approach could be sufficient.

What types of value can the approach help me understand?

Quickscan combined the benefits of a quantified, spatial approach with a deliberative, stakeholder process. It can be used to explore most categories of value (biophysical, monetary, socio-cultural as well as aspects related to the intrinsic value of nature). What values are explored will depend on the individuals involved and the priorities of the case study.

How does the approach address uncertainty?

Uncertainty can be expressed explicitly within the rules used if needed. Often uncertainty is addressed within a rule showing different options for classification (e.g. the upper and lower sustainability boundaries of an indicator). Where and how this uncertainty is dispersed can then be assessed spatially under different alternatives, as well as summarised as the total potential uncertainty in the region of interest.

How do I apply the approach?

The QUICKScan software encompasses a modelling environment that needs to be filled with spatial and/or statistical data during the preparation phase. The tool is not restricted to a specific geographic location or spatial resolution. Knowledge rules, capturing participant knowledge, are used to combine data and derive indicators. Typically the rules use classifications to describe quantitative data and typologies to give qualitative data meaning. Rules may be linked together to form a chain of rules. Alternative (chains of) rules are used to capture different options. Derived data from alternatives can be aggregated (e.g. by administrative units or biophysical units, such as catchments or climatic zones) to be displayed in tables and charts for overviews.

Figure 2 shows the different phases which are generally formulated using QUICKScan in a participative setting: (i) scoping; (ii) preparation; (iii) the workshop(s); and (iv) reporting. The scoping in the first phase is intended to identify and formulate key questions together with the stakeholders (Figure 2). The second phase is needed to prepare the spatial datasets to be used in the workshop. The third phase is the workshop itself which focuses on creating a common understanding about the key questions, their options and alternatives. To ensure good outputs and ease participation in this phase, the chained rules are often first defined in a simplified way, and then refined in iterations based on results and stakeholder needs. New iterations are also often used to incorporate new insight and demands. If needed, a summarising report in the form of a PowerPoint or a Document is produced describing the results from the workshop and the prior phases (Figure 2).

Below is an example of how an exploratory two day workshop could be organised and carried out:

A) Before the workshop:

- Define the program around a policy question.
- Search, obtain and organise the data needed.

B) At the workshop: example agenda

Day 1 Morning (9:30 - 12:30)

- *Define storylines.*
- *Determine how to measure the impact (key outputs/key indicators).*

Day 1 Afternoon (14:00 - 18:00)

- *Build workflow for policy alternatives*
- *Relate alternatives and key output to data.*

Day 2 Morning (9:30 - 12:00)

- *Present results, discuss and iterate.*
- *Define next steps and needs.*

C) After the workshop:

- Produce the report.

Send report to stakeholders and iterate if needed to take account of feedback and additional demands.

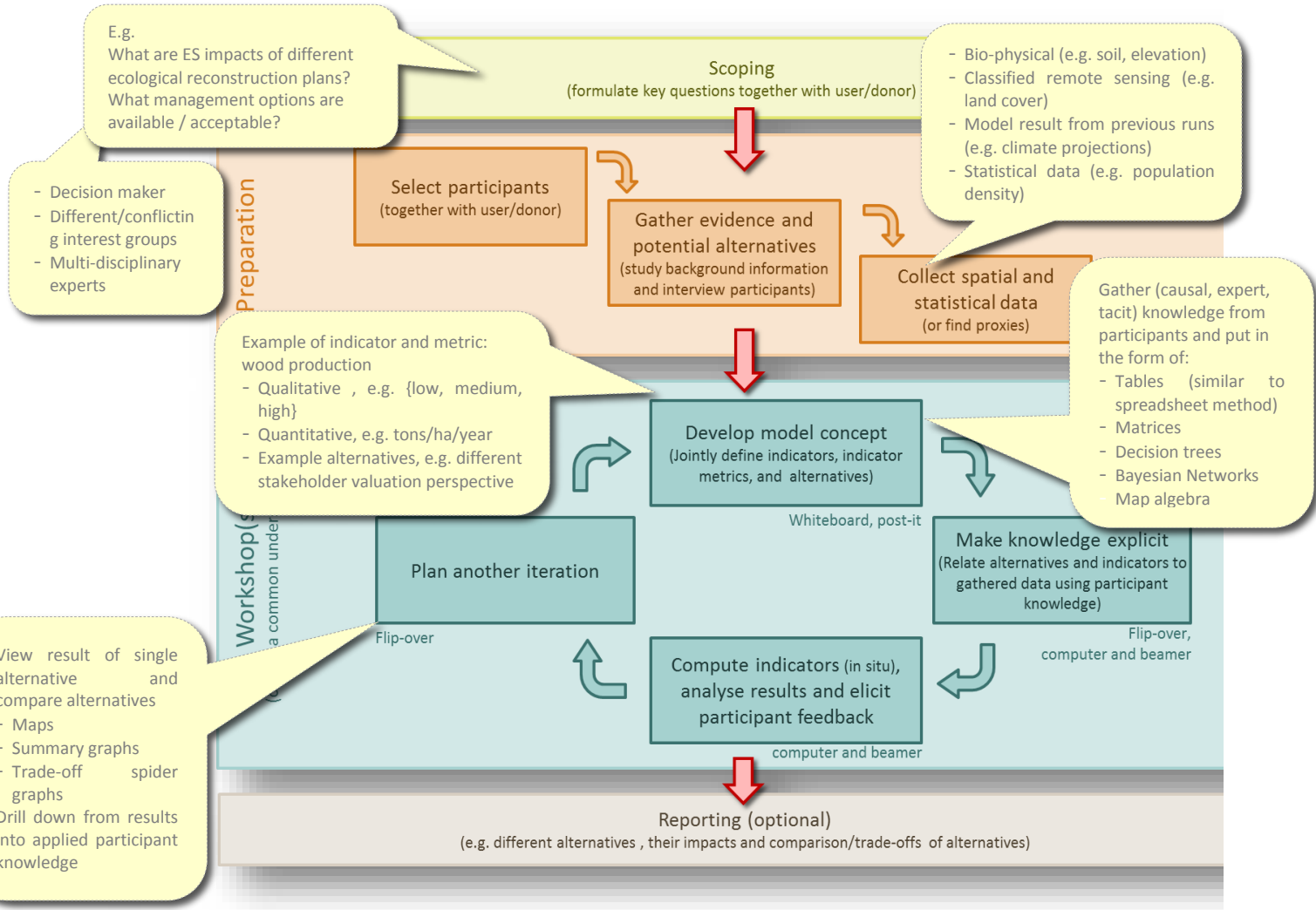


Figure 2: The different phases in the QUICKScan process.

In summary, it can be said that organising one or more workshops with stakeholders is the essential part of implementing a successful QUICKScan method. Figure 3 provides a summary of the three elements that are crucial to run a successful QUICKScan workshop: people, process, and technology.

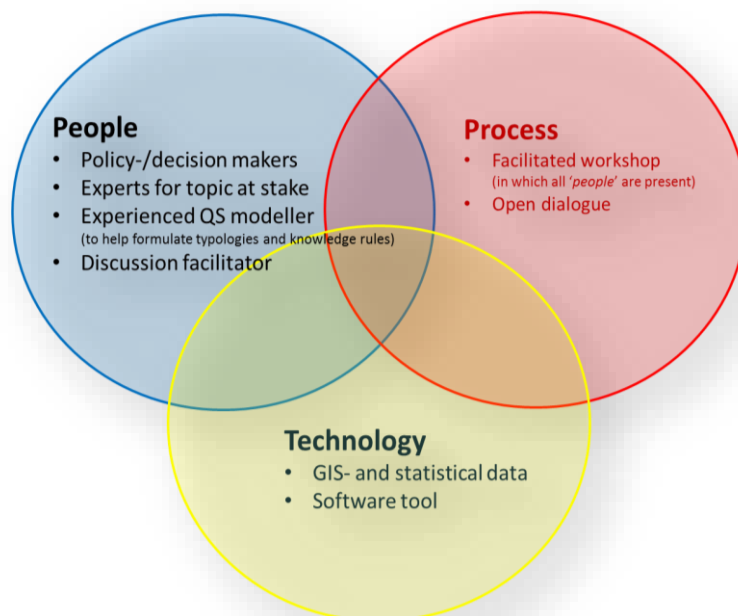


Figure 3: Overview what is needed to organise a QUICKScan workshop.

Requirements

<i>Data</i>	<input checked="" type="checkbox"/> Data is available <input checked="" type="checkbox"/> Need to collect some new data <input type="checkbox"/> Need to collect lots of new data	The QUICKScan software encompasses a modelling environment that needs to be filled with spatial and/or statistical data during the preparation phase. Depending on the topic case study data is either already available in the QUICKScan tool (e.g. EU level, ES) or it needs to be prepared specifically for the workshop. The tool is not restricted to a specific geographic location or spatial resolution.
<i>Type of data</i>	<input checked="" type="checkbox"/> Qualitative <input checked="" type="checkbox"/> Quantitative	Both can be used. Typically the rules use classifications to describe quantitative data and typologies to give qualitative data meaning. Derived data can be aggregated to be displayed in tables and charts for overviews.
<i>Expertise and production of knowledge</i>	<input checked="" type="checkbox"/> Work with researchers within your own field <input checked="" type="checkbox"/> Work with researchers from other fields <input checked="" type="checkbox"/> Work with non-academic stakeholders	QUICKScan is (and thus can be) used in all three different mentioned settings, depending on the focus of the workshop. QuickScan is appropriate for targeted users: Multilateral, regional, national and local decision-makers; Multilateral, regional, national and local policy desk officers and project managers; Scientific experts and thematic researchers; NGOs staff, corporates staff, government officers. QuickScan can be targeted for: Participatory settings/workshops; Policy settings/explorations/assessments;

		Scientific baselines/iterations/validations; Ex-ante/ex-post impact assessments.
<i>Software</i>	<input checked="" type="checkbox"/> Freely available <input checked="" type="checkbox"/> Software licence required <input type="checkbox"/> Advanced software knowledge required	Two versions exist: 1. Community-edition: Light-weight latest version with up to 10 user defined rules. No support provided. 2. Ultimate edition: Full featured, latest stable version with an installation set, a user manual, support and free upgrades for a year. Software licence is required.
<i>Time resources</i>	<input checked="" type="checkbox"/> Short-term (< 1 year) <input type="checkbox"/> Medium-term (1-2 years) <input type="checkbox"/> Long-term (more than 2 years)	QUICKScan usually requires some days of data preparation and one or two days for the workshop itself. Usually from start to finish it requires less than a month of lead time.
<i>Economic resources</i>	<input checked="" type="checkbox"/> < 6 person-months <input type="checkbox"/> 6-12 person-months <input type="checkbox"/> > 12 person-months	Usually two or three persons are involved in both the preparation phase and the workshop itself, requiring less than one person month in total.
<i>Other requirements</i>		

Where do I go for more information?

For further reading and references see the QUICKScan website: <http://quickscan.pro>, which includes an overview of the most important QUICKScan reports and case studies. The following references are mentioned on the website (<http://quickscan.pro/showcases.html>):

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