TOOLKIT FOR TRAINING COLLABORATIVE PLANNING

Methods Manual

SELECTED METHODS FOR COLLABORATIVE PLANNING

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Introduction

This manual gives an overview of selected methods for collaborative planning. It is part of the CoPack toolkit for collaborative planning as presented on the website copack.oamk.fi.

The goal of CoPack is to provide conceptual and methodic support for collaborative planning processes. Of these issues, the Methods Manual covers the second one only. For more information on collaborative planning and how to prepare for a collaborative process, we recommend to also consult the CoPack Trainer's guide and related materials.

This manual consists of an introductory part and 25 method descriptions. As the latter are meant to be printed out individually, the numbering of figures and tables starts at 1 with each description. Page numbering, by contrast, runs consecutively through the whole document.

Disclaimer

Lifelong Learning Programme

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How to find methods for a particular purpose

The manual comprises very different methods for very different purposes. To facilitate the search, this section first classifies methods under some keywords, or frequently needed purposes. Each method is listed under the best-fitting keyword, but some occur multiple times.

OBTAINING INFORMATION ABOUT PEOPLE AND SITUATIONS

The following methods can serve to obtain information on a problem and the people involved in it.

- CatPac
- Cognitive Mapping
- Stakeholder Analysis
- Surveys
- SWOT

ANALYSING AND VISUALISING PROBLEMS AND RELATIONSHIPS

These methods can serve to get a more detailed concept of complex problems, of parties involved and their relationships, once initial data has been obtained.

- Bayesian Belief Networks (BBN)
- CATWOE
- Cognitive Mapping
- Hope-map
- Influence Matrix

GATHERING AND DEVELOPING IDEAS

These methods include both what is usually called ‘brainstorming’ and discussing a topic. They do not rely on mathematical calculations and do not produce quantitative information. Although easy to understand, some of them require considerable time and preparation.

- 6-3-5 Brainwriting
- Design Charrette
- Nominal Group Technique
- Planning for Real
- Visioning and Pathways
- World Café

EVALUATING ALTERNATIVES

The following methods are, in general, rather scientific, referring to the amount of special knowledge and mathematical calculations involved. They are suited to finding out more about the impacts of different scenarios on a planning environment.

- AHP, ANP
- A'WOT
- BBN
- Mesta
- MCDA
- SMART

ESTABLISHING PREFERENCES

The following methods can serve to explore stakeholders' views and establish preferences as a preliminary stage to decision-making:

- AHP, ANP
- MCDA-based methods
- Scoring
- Approval Voting, Borda Count (voting methods)
- Discourse-based Valuation

NEGOTIATING AND DECISION-MAKING

Some methods are explicitly dedicated to organising negotiations and making decisions:

- Discourse-based Valuation
- Voting methods

MULTI-STAGE METHODS

These methods span a wider range of applications and may be said to incorporate overall approaches to collaborative processes.

- Action Learning
- Planning for Real

Classification of methods under different criteria

The following tables attempt at a classification of methods under certain criteria which may be helpful for estimating whether a particular method is applicable to a case and what it takes to apply it.

APPLICABILITY TO DIFFERENT STAGES OF A COLLABORATIVE PROCESS

Table 1 classifies methods under the **three-stage model** presented in CoPack's 'Methods and tools' section, using dot symbols as follows:

 Applicable  Partly applicable

'Applicable', in this context, means that the stage named is the primary domain of the method. 'Partly applicable' means that it can be seen as part of that stage under certain conditions. A missing symbol is for 'not applicable', meaning that the method cannot usually contribute to that stage.

SPECIAL REQUIREMENTS OF METHODS

Table 2 lists what facilitators and participants may need to apply a particular method.

Its second column lists the level of **expertise** or special knowledge involved. With methods that require participation of all group members, this refers to the knowledge *every participant* must have. Facilitators may need more profound insight, if only to pick appropriate methods.. The table uses a rating as follows:

 Easy to perform, no special knowledge required

 Moderate special knowledge and insight required

 High level of expertise required

Additionally, the third column informs on the **equipment needed** in the following categories:

(no icon)	Easy to perform with paper and pen
	Computer with basic office software recommended
	Depends on special software
	Web application, requires internet connection
	Special equipment or preparations needed (e.g. models)

In connection with computers, 'Basic office software' usually refers to programs for spreadsheet calculation and visual presentation of results. If such are not available, a pocket calculator and a blackboard or whiteboard will do in most cases, and it is recommendable to have them at hand anyway.

QUALITY OF RESULTS

Table 3 compares methods against the quality of the results they render.

Its second column is related to that of Table 2 but focuses on the results rather than the process of applying a method. **Understandability** in this context means whether the method will produce documents or other results easily understandable by laypeople. This may be important for documentation purposes or if the proceedings of a planning group must be communicated to a wider audience. The classification is as follows:

Results are usually understandable to specialists only

Results are understandable with some insight into the project

Results are easily understandable even to outsiders

The third column of Table 3 states whether a method involves **quantification** of results. Strictly spoken, every method can produce quantitative information, even the simplest brainstorming or negotiation, if its subject is quantifiable. The table, however, lists the methods that explicitly include some kind of computing or classification, thus producing new quantitative information (figures, ratings) as opposed to mere statements. If this is the case, it is indicated by a tick:

Method produces quantitative information

Table 1: Applicability of methods to different stages of a collaborative process

	Problem identification	Problem structuring	Problem solving
3-6-5 Brainwriting	◑		●
Action Learning	◑	●	●
AHP		●	◑
ANP		●	◑
A'WOT	●	◑	◑
Bayesian Belief Networks (BBN)	◑	●	◑
CatPac	●		
CATWOE	◑	●	
Cognitive Mapping	●	◑	◑
Design Charrette	●	◑	◑
Discourse-based Valuation	◑	◑	●
Hope-map		●	
Influence Matrix	◑	●	
MCDA		●	◑
Mesta		●	◑
Nominal Group Technique (NGT)		◑	●
Planning for Real	●	◑	◑
Scoring		◑	●
SMART		●	●
Stakeholder Analysis	●	◑	
Surveys	●		◑
SWOT	●	●	
Visioning and Pathways	●	◑	●
Voting methods			●
World Café	●		◑

Legend: see page 7

Table 2: Special requirements of methods

	Expertise needed	Equipment needed
3-6-5 Brainwriting	○	
Action Learning	◑	
AHP	●	
ANP	●	
A'WOT	●	
Bayesian Belief Networks (BBN)	●	
CatPac	●	
CATWOE	◑	
Cognitive Mapping	●	
Design Charrette	◑	
Discourse-based Valuation	○	
Hope-map	●	
Influence Matrix	◑	
MCDA	◑	
Mesta	◑	
Nominal Group Technique (NGT)	○	
Planning for Real	○	
Scoring	◑	
SMART	●	
Stakeholder Analysis	◑	
Surveys	○	
SWOT	○	
Visioning and Pathways	◑	
Voting methods	○	
World Café	○	

Legend: see page 7

Table 3: Methods compared by the quality of their results

	Understandability	Quantification
3-6-5 Brainwriting	●	
Action Learning	●	
AHP	○	✓
ANP	○	✓
A'WOT	◑	✓
Bayesian Belief Networks (BBN)	◑	✓
CatPac	◑	✓
CATWOE	◑	
Cognitive Mapping	●	
Design Charrette	◑	
Discourse-based Valuation	●	
Hope-map	◑	✓
Influence Matrix	◑	✓
MCDA	◑	✓
Mesta	◑	✓
Nominal Group Technique (NGT)	●	✓
Planning for Real	●	
Scoring	◑	✓
SMART	◑	✓
Stakeholder Analysis	◑	
Surveys	◑	
SWOT	●	
Visioning and Pathways	●	
Voting methods	●	✓
World Café	●	

Legend: see page 8

6-3-5 Brainwriting

6-3-5 Brainwriting is a group creativity technique based on the concept of brainstorming. The aim is to generate 108 new ideas in half an hour. The method is suitable for a moderate number of participants.

Scope of application

To develop, collect and discuss ideas and devise rough solutions. The results will invariably require further structuring which is a task the method cannot accomplish.

Method description

6-3-5 Brainwriting (also known as the 6-3-5 method or method 635) is a group creativity technique traditionally used in marketing, advertising, design, writing and product development. It was originally developed by Professor Bernd Rohrbach in 1968. It has similarities with brainstorming methods but starts with each person writing down their thoughts and ideas first instead of an open discussion. In a similar way to brainstorming, it is not the quality of ideas that matters but the quantity.

1. Participants are divided into small groups of 3-8. The ideal number is **6**.
2. The session starts with a **clear** presentation of the problem/question to be answered. The problem has to explained, so that every participant really understands what they are working on.
3. Each participant writes down **3** solutions/ideas on the provided brainwriting sheet in **5** minutes (see Table 1).

Table 1: An example of a brainwriting sheet

Name	Idea/solution 1	Idea/solution 2	Idea/solution 3
Mary			
John			
Kathryn			
Danny			
Stephen			
Laura			

4. The sheets of paper are exchanged so that other participants can further develop/expand the original three solutions/ideas or provide completely unrelated new ideas. The exchange of papers continues until everyone in the group has gotten a chance to see each of the three original solutions/ideas and contribute to the document.
5. In half an hour 6 (6 people) x 3 (3 ideas) x 6 (6 exchanges) = 108 solutions/ideas in total can be gathered (note that the number of ideas, number of people and time limits can all be variable).
6. In the next step the gathered ideas/solutions are reviewed. Everyone can choose 1-3 most interesting ideas on their own brainwriting sheet for further discussion. The chosen ideas can be written down on pieces of paper and attached to a wall so that everyone can see them. Any exact duplicates are eliminated, but all the variations or extensions of the solutions/ideas are kept.
7. A discussion starts with everyone shortly presenting in turn their most interesting ideas/solutions. At this point discussion can and should be encouraged.
8. A consensus should be reached to pursue some of the most promising ideas further. Some type of voting can be arranged.

Benefits/Drawbacks

- ✚ Easy for facilitator and participants.
- ✚ Exchange of knowledge and opportunities to develop ideas.
- ✚ Everybody gets to express their opinions.
- ━ A large quantity of ideas doesn’t guarantee their quality.
- ━ Some participants may find it difficult to express themselves in writing.

References

Rohrbach, Bernd 1969: "Kreativ nach Regeln – Methode 635, eine neue Technik zum Lösen von Problemen". Creative by rules - Method 635, a new technique for solving problems first published in the German sales magazine "Absatzwirtschaft", Volume 12 and 19.

More information about 6-3-5 Brainwriting

A short (5 min) video about the 6-3-5 method of brainwriting can be found on YouTube.

Action Learning

Action learning is a dynamic process where a small group of participants meets regularly to work and learn together by tackling real issues and reflecting on their actions. Action learning can assist organisations to challenge the status quo, and to develop creative, flexible and successful strategies. Learning is the primary goal, even though real problems are being solved.

Scope of application

Action Learning can cover all stages of a collaborative process. It comes, in fact, very close to the idea of collaborative planning and may be termed a strategy rather than a method.

Method description

Action Learning was developed by professor Reginald Revans in the 1940s (Revans, 1982). It gained popularity especially in the 1990s and is today practised by a wide community of businesses, governments, non-profit organisations and educational institutions. Action Learning is based on a radical concept: **L = P + Q**. Learning (**L**) requires Programmed Knowledge (**P**) (i.e. knowledge in current use) plus Questioning Insight (**Q**).

Action Learning group participants meet on an agreed basis over an agreed period of time to support one another in their learning in order to take purposeful action on work issues. The group, which is sometimes called an Action Learning Set, should be small, 4-8 people, voluntary or appointed, with diverse backgrounds, skills and experience. Participants should meet as peers, empowered and encouraged to contribute, no matter what their rank or role within the organisation. A facilitator can be used but is not necessary. If wanted, facilitation can be used primarily at the start of an Action Learning process and then quickly fade out. A reflective journal or a learning log should be kept throughout the process.

The Action Learning process consists of different phases (there are many variations):

1. **Presenting the problem**. The problem should be urgent and significant and should be within the responsibility of the team to resolve.
2. **Insightful questioning and reflective listening.** Three basic questions commonly begin the Action Learning process in addressing a real problem. First, what should be happening? Second, what is stopping us from doing it? Third, what can we do? This is the time for fresh questioning and thinking. Questions help to understand and clarify problems, and open up paths to innovative solutions. Questions are also the key for individual, team and organisational

learning. In the end, the group members must reach a consensus on the problem before moving on to the next stage.

3. **Framing and formulating the goal.** The next action stage is to determine what the group, organisation or individual is striving to achieve. The ultimate goal may not be clearly and fully defined at this stage — it will become more refined as the group works on strategies.
4. **Developing and testing strategies**. Once the group has its goal, the next step is to develop and test strategies. When formulating the action plan, these questions should be addressed: What will work best and why? What resources are needed? What will be the impact of the action? More than one strategy should be developed and, if possible, tested.
5. **Taking action.** Action is an important element of Action Learning group work. Some concrete, specific action should be agreed upon and taken at the end of each session. Action Learning requires that the action learning group be able to take action on the problem to which it has been assigned. The group must either have the power to take action, or be assured that its recommendations will be implemented.
6. **Bringing results back and reflecting on the action.** The Action Learning group meets again and discusses what worked and what did not.
7. **Integrating new knowledge in practice.** Everything learnt during the process is documented as new knowledge for use in practice.

Benefits/Drawbacks

- \+ Offers a creative ways to act and learn at the same time.
- \+ Can help to solve complex, urgent problems.
- − Requires multiple meetings, cannot be done in one sitting.
- − Structured and quite inflexible method.

References

Revans, R. W. 1982: The origin and growth of action learning. Brickley, UK: Charwell-Bratt.

More information about Action Learning

Boshyk, Yury, and Dilworth, Robert L. 2010: Action Learning and Its Applications. Basingstoke, UK: Macmillan.

ITAP InternationaL: Article by Robert L. Dilworth: Action Learning in a Nutshell http://www.itapintl.com/facultyandresources/articlelibrarymain/action-learning-in-a-nutshell.html

Analytic Hierarchy Process (AHP)

The Analytic Hierarchy Process (AHP) method is a numerical decision analysis method. In natural resources planning, AHP has been mainly used for discrete-choice problems. AHP is most suitable when the number of planning participants, decision criteria and decision alternatives is quite low (less than 10 per hierarchy level). There are many decision-support computer programs available to perform the necessary calculations.

Scope of application

This method can help structure and decide problems by evaluating alternatives.

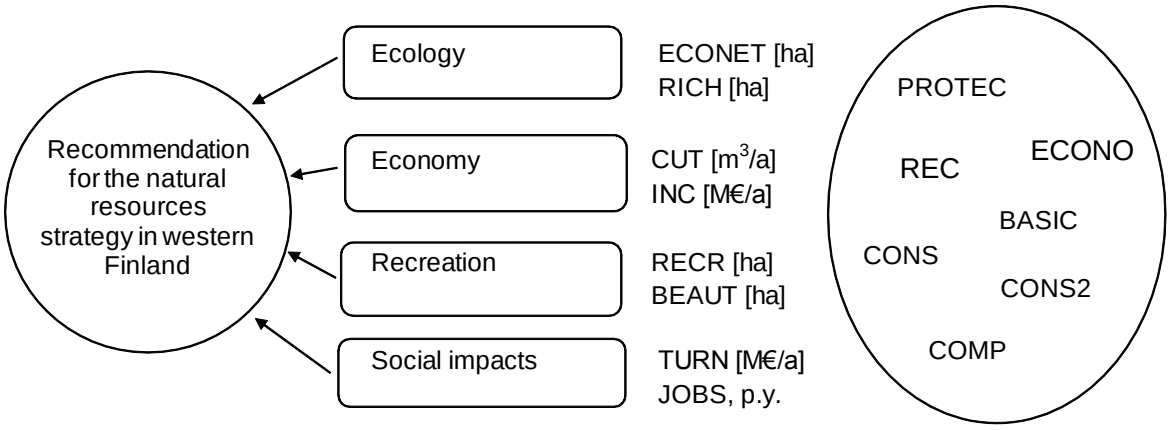
Method description

The method is based on mathematics and psychology and was developed by Thomas L. Saaty in the 1970s. It has been extensively studied and refined since then (Saaty, 1977). Rather than resulting in a 'correct' decision, AHP helps decision makers find one that best suits their goals and their understanding of the problem. It provides a comprehensive and rational framework for structuring a decision problem, for representing and quantifying its elements, for relating those elements to overall goals, and for evaluating alternative solutions.

The four basic steps involved in using the AHP to address decision problems are:

1. **A decision hierarchy is constructed by decomposing the original problem into a hierarchy of interrelated decision elements.** In the simplest case, the decision hierarchy includes the decision maker's goals and the decision alternatives. However, the hierarchy may also contain additional levels. For example, in participatory cases the hierarchy may also include the planning participant's level, and when using AHP as a foresight method, different future scenarios of the operational environment can also be defined in the hierarchy.
2. **Pairwise comparisons are made at each level of hierarchy.** Direct numerical values, verbal statements of importance, or graphical representations can be used for presenting preference information in the pairwise comparisons. The preference data is translated into a numerical range also when using verbal or graphical descriptions as the original scale of measuring preferences.
3. **Using the preference data collected in pairwise comparisons as input, the relative weights (importance/preference) of elements at each level are computed.** This is done automatically when using an appropriate decision-support software. The AHP has been programmed for many decision analysis software (for example Web-HIPRE, http://www.hipre.hut.fi/)

4. **The ratings for the decision alternatives are calculated based on the relative weights of the decision elements.** This can also be done automatically. Furthermore, a so-called *sensitivity analysis* is an additional step of the AHP method. In the sensitivity analysis, for example, the effects of changing the weights of the decision criteria on the priorities of the decision alternatives can be analysed.



Example: **A decision hierarchy**. This hierarchy was formulated for regional strategic-level planning of natural resources in Finland. The planning area covered the state-owned land and water areas in western Finland and the planning process was carried out by Finnish government organisation Metsähallitus.

The mathematics of AHP are not explained here. For more information, see the list at the end of this document.

Benefits/Drawbacks

- \+ Analytical and profound method for supporting selection tasks with well-structured problems.
- \+ Can also be used for ranking, prioritization, resource allocation, benchmarking, quality management and conflict resolution problems.
- − Requires a facilitator who quite deeply understands the theory of decision analysis.
- − Profound introduction for the participants is needed in participatory cases.

References

Saaty, T.L. 1977. A scaling method for priorities in hierarchical structures. Journal of Mathematical Psychology 15(3): 234-281. doi:10.1016/0022-2496(77)90033-5

More information about AHP

Alho, J.M., Kolehmainen, O. and Leskinen, P. 2001. Regression methods for pairwise comparison data. P. 235-251 in The Analytic Hierarchy Process in Natural Resource and Environmental Decision Making, Schmoldt, D.L., Kangas, J., Mendoza, G.A. and Pesonen, M. (eds.). Kluwer Academic Publishers.

Ananda, J. and Herath, G. 2003. The use of Analytic Hierarchy Process to incorporate stakeholder preferences into regional forest planning. Forest Policy and Economics 5(1): 13-26. doi:10.1016/S1389-9341(02)00043-6

BOKU University of Natural Resources and Life Sciences, Vienna: An Illustrated Guide to the Analytic Hierarchy Process http://www.boku.ac.at/mi/ahp/ahptutorial.pdf

Kangas, A., Kangas, J. & Kurttila, M. 2008. Decision support for forest management. Managing Forest Ecosystems 16. Springer. 222 p.

Analytic Network Process (ANP)

The Analytic Network Process (ANP) method is a multi-criteria decision analysis method that allows incorporating interdependencies among criteria and indicators in decision-making. The method is based on pairwise comparison and eigenvalue calculations. Specific computer software is recommended for the calculations.

Scope of application

Like AHP, this method can help structure and decide problems by evaluating alternatives.

Method description

The Analytic Network Process (ANP) is a generalisation of the Analytical Hierarchy Process (AHP) (Saaty, 1977, 1996) which allows the inclusion of interdependencies among indicators into the decision model. It is based on the concept of pairwise comparisons between elements and clusters using ratio-scale measurement of preferences. Using special software for ANP (see below) is strongly recommended.

From a methodological point of view, AHP and ANP are very similar. There are three generic principles that apply to both:

1. **A decision problem is decomposed** into a multi-attribute structure in terms of a goal, a set of criteria and sub-criteria and a selection of decision alternatives (*decomposition principle*). This is also valid for the ANP with the generalisation that the hierarchical structure of the AHP is extended to a general *n*-dimensional network. A typical ANP model is arranged in clusters containing, for instance, indicators. Any dependence among the indicators is mapped and the direction of the influences is determined. Connections can be set among elements within a cluster (inner dependence) and between clusters (outer dependence).
2. Secondly, preferences for alternatives are derived by ratio-scale measurement and **pairwise comparisons** (*principle of comparative judgment*). The eigenvalue approach provides a measure for the consistency of the judgments given (consistency ratio), aiming to improve the coherence among redundant judgments. Pairwise comparisons are performed on a scale of relative importance with the option to express preferences between two elements on a ratio scale from equally important (i.e., equivalent to a numeric value of 1) to absolute preference (i.e., equivalent to a numeric value of 9) of one element over another. For the ANP, pairwise comparison is done for both weighing the criteria and estimating the direction and importance of influences of one element on another, numerically expressed as ratio scales in a so-called supermatrix.

3. Thirdly, the **synthesis of local priorities** to overall priorities for each alternative allows for both a cardinal and ordinal ranking of alternatives (*synthesis of priorities principle*). In the ANP, the basic aggregation principle is also an additive one which is especially apparent in the form of the semi-hierarchical control-hierarchy.

In practical terms, the building of an ANP model consists of several more steps:

1. Choosing a structure: a flat generic network or a control hierarchy defining a control criterion (goal).
2. Definition of criteria clusters.
3. Definition of indicators assigned to the criteria clusters.
4. Definition of a cluster of strategies.
5. Definition of interdependencies (influences) among indicators within a cluster or between clusters.
6. Interlinking the cluster of strategies with the criteria clusters to incorporate indicator performances.
7. Creating an unweighted supermatrix of ratio scales by pairwise comparison of the importance of elements with regards to a parent element.
8. Transforming performance data of the strategies onto a ratio scale.
9. Weighing the clusters according to their relative priority.
10. Calculating overall priorities for each strategy within a limits supermatrix

Benefits/Drawbacks

- ✚ Allows to incorporate complexity into decision analysis.
- ✚ Promotes systemic thinking.
- ━ Setting up the decision model is a laborious procedure.
- ━ Pairwise comparisons and synthesis are not intuitive and are very technical.

References

Saaty, T.L. (1977): A scaling method for priorities in Hierarchical Structures. Journal of Mathematical Psychology 15: 234–281.

Saaty, T.L. (1996): Decision Making with Dependence and Feedback: The Analytic Net-work Process. Pittsburgh: RWS Publishing.

More information about ANP

Tutorial on the use of ANP and the available software: www.superdecisions.com.

A'WOT

A'WOT is a hybrid method specially developed to improve the quantitative information basis of practical strategic planning. The method typically integrates SWOT analysis and Analytic Hierarchy Process (AHP). Also other multi-criteria decision analysis (MCDA) methods like the Simple Multi-Attribute Rating Technique (SMART) and Stochastic Multicriteria Acceptability Analysis with Ordinal criteria (SMAA-O) have been applied within A'WOT.

Scope of application

Serves to analyse and structure problem environments.

Method description

The method has been developed by the Finnish Forest Research Institute (Metla) (Kurttila et al., 2000). In the beginning of an A'WOT process, SWOT analysis is formulated to have **a decision hierarchy** in which SWOT groups are the main criteria, and SWOT factors of each SWOT group form the sub-criteria of the group. The priorities of the elements of the hierarchy are evaluated by using MCDA methods. The idea in utilizing the MCDA technique within the SWOT framework is to systematically evaluate the SWOT factors and make them commensurable as regards their intensities. The SWOT analysis provides the basic framework within which to perform an analysis of the decision situation, and the MCDA technique assists in carrying out the SWOT analysis more analytically. The strategy alternatives can be at the lowest level of the hierarchy. In this case, the results obtained from the use of the A'WOT method are thus the global priorities of the alternatives, i.e., how well the alternatives fit in with the operational environment.

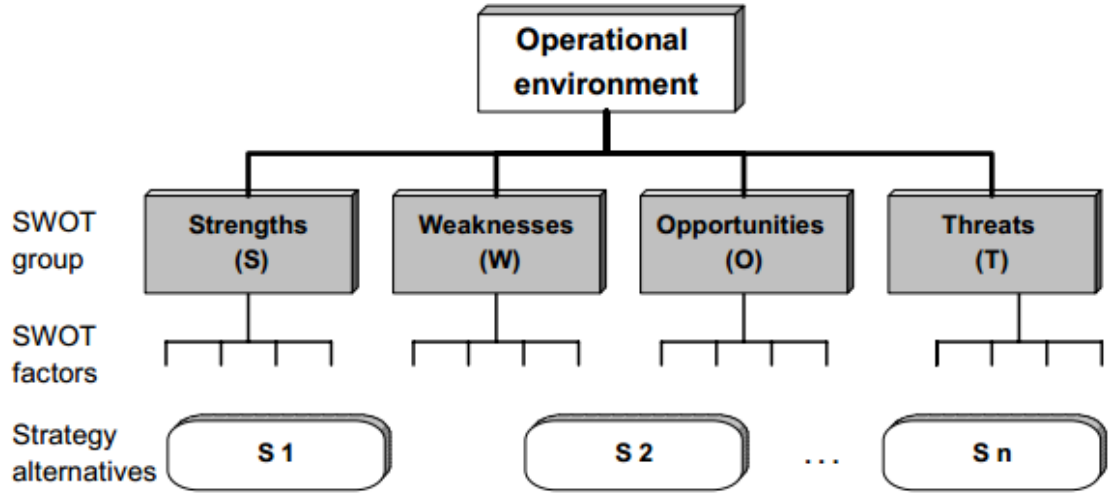


Figure 1. The hierarchical presentation of A'WOT analysis.

The method proceeds as follows:

1. **SWOT analysis** is conducted. Relevant factors of the external and internal environment are identified and included in SWOT analysis. When standard AHP is applied, it is recommended that the number of factors within a SWOT group should not exceed ten because the number of pairwise comparisons needed in the analysis can otherwise be too many.
2. **Pairwise comparisons between SWOT factors** are conducted within every SWOT group. When making the comparisons, the questions at stake are (1) which of the two factors compared is greater, and (2) how much greater? With these comparisons as the input, the relative local priorities of the factors are computed using the eigenvalue method. These priorities reflect the decision-maker's perception of the relative importance of the factors.
3. **Pairwise comparisons are made between the four SWOT groups**. The factor with the highest local priority is chosen from each group to represent the group. These four factors are then compared and their relative priorities are calculated as in step 2. These are the scaling factors of the four SWOT groups, and they are used to calculate the overall (global) priorities of the independent factors within them. This is done by multiplying the factors' local priorities (defined in step 2) by the value of the corresponding scaling factor of the SWOT group. The global priorities of all the factors sum to one.
4. **Pairwise comparisons are made between alternative strategies subject to all SWOT factors.** When making the comparisons, the questions at stake are (1) which one of the two strategy alternatives is better in maximizing or responding to the specific factor (when the factor in question is strength or opportunity), or which one of the two alternatives is better in minimizing or avoiding the SWOT factor (respectively, weakness or threat); and (2) how much better. The overall importance of the strategy alternatives can then be computed.

Benefits/Drawbacks

- \+ Suitable for nearly all decision situations where SWOT analysis has been traditionally used.
- \+ Provides a solid decision support and also an effective framework for learning in strategic decision support in numerous situations.
- \+ Quite quickly conducted with computers.
- − Understanding the rationale behind the method can take some time and explanation.

References

Kurttila, M., Pesonen, M., Kangas, J. and Kajanus, M. 2000: Utilizing the analytic hierarchy process (AHP) in SWOT analysis – a hybrid method and its application to a forest-certification case. Forest Policy and Economics 1: 41-52.

More information about A'WOT

Alho, J.M., Kangas, J., 1997: Analyzing uncertainties in experts' opinions of forest plan performance. Forest Science 43, 521–528. http://www.ingentaconnect.com/content/saf/fs/1997/00000043/00000004/art00009

Kajanus, M., Leskinen, P., Kurttila, M. & Kangas, J. 2012: Making use of MCDS methods in SWOT analysis - Lessons learnt in strategic natural resources management. Forest Policy and Economics 20: 1-9.

Leskinen, L.A., Leskinen, P., Kurttila, M. Kangas, J. and Kajanus, M. 2006. Adapting modern strategic decision support tools in the participatory strategy process—a case study of a forest research station. Forest Policy and Economics 8:267– 278.

Bayesian Belief Networks (BBNs)

Bayesian Belief Networks (BBNs) are probability-based modelling tools, usually computer software packages, for understanding variables, knowledge or data and relationships between them. BBNs allow a formal and graphical representation of a problem domain and describe the factors influencing a decision or a problem and how they relate to each other by means of probabilities.

Scope of application

Structuring and visualising complex problems.

Method description

Bayesian Belief Networks (BBNs) are often used by practitioners and scientists to incorporate probabilities and uncertainty in modelling environmental problems and supporting decision making. BBNs are a kind of probabilistic graphical representation of a problem that describes the influencing factors and how they relate to each other. They may be constructed to represent qualitative, quantitative, discrete or continuous relationships. Most often the factors and relationships are defined in numerical terms, but BBNs may also deal with qualitative variables (Cain, 2001). BBNs produce directed graphs or network models that incorporate uncertainty and that can learn from data or expert opinion. The models are dynamic, meaning that variables can be changed to test the impact on other variables. The models can be very simple, describable on paper but more often they are complex, created with computer programs.

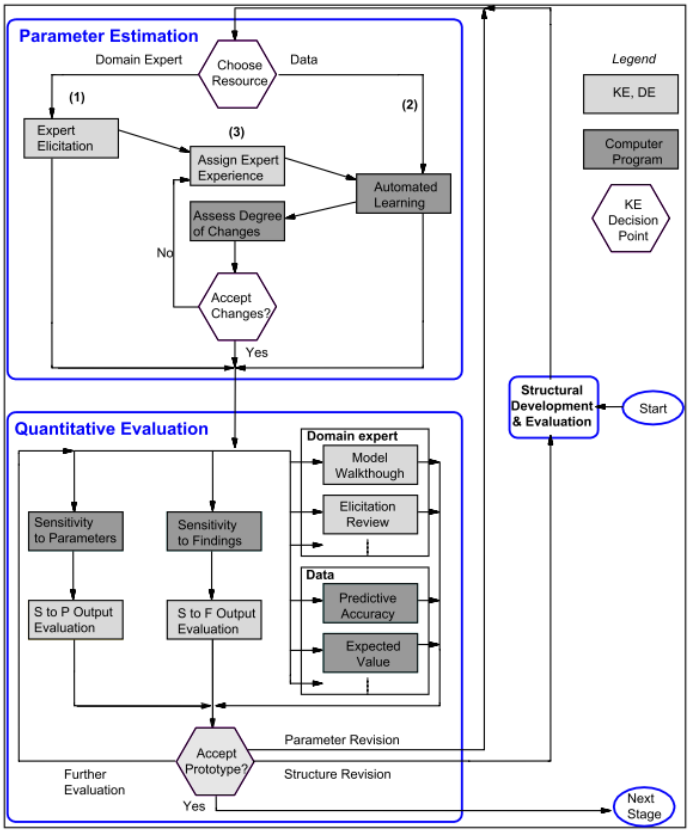
The use of BBNs requires time, **several workshop sessions** with small groups (less than 10) of motivated and interested participants. Facility and comfort with concepts of probability and uncertainty are important. Participants should have knowledge and experience with the system being modelled in order to provide information and test the model. **Preliminary discussions** with a target group define the factors that play a role in a system and the relationships between factors. Information on the factors is collected and included in the model. Participants use their knowledge and intuition about behaviors to test and tweak the model until it represents interrelationships and cause and effect realistically.

Once the model is developed, participants can test possible outcomes by changing the input of the variables. Due to their capacity to display causal relationships and their ability to cluster the main problem into smaller solvable sub-problems BBNs can be used to decrease complexity. BBNs are a suitable method for stakeholder communication because they use a more understandable terminology than other modelling techniques do.

Following the knowledge engineering process introduced by Woodberry et al. (2004) a spiral model containing **three main process steps** can be described:

1. Structural development
2. Parameter estimation
3. Quantitative evaluation

Every stage of the process ends with a prototype of the BBN to be developed.



For the first process step, a **preliminary causal network**, which represents causal relationships between knowledge domain variables, has to be developed.

For the second step Pollino et al. (2007) provide a way to **parameterise BBNs** with both data and knowledge.

Third, the knowledge engineering process of Bayesian Belief Networks recommends two types of **sensitivity analyses**. Sensitivity to parameters is used to estimate sensitivity of predictions to parameter changes and sensitivity to findings is utilized to show influences on one node if there is evidence on another parent node.

Some guidelines should be followed in Bayesian Belief Network development:

- Parent nodes should be limited to three or less.
- Nodes without parents, so called input nodes, might be filled with existing data.
- Intermediate nodes should be used to summarize.
- All nodes should be able to be tested, observed and quantified.
- As few states as possible to indicate the influence of the node should be used.
- Enough nodes are needed to guarantee required precision and allow for classification of a variety of data in the input nodes.
- Network depth should not exceed four layers.
- Different spatial scale can be implemented by using the output of one network as input for another one.

- All network components should be documented in writing.
- Relationships between input nodes should be used to indicate correlations between them.

Benefits/Drawbacks

- ✚ Allows incorporating probabilities and uncertainty in modelling.
- ✚ Encourages stakeholder discussion and interaction.
- ✚ Almost anything can be modelled with BBNs.
- ━ Requires a skilled facilitator, he or she must have training and experience with the method, quantitative skills and knowledge of probability.
- ━ Usually requires special software.
- ━ Not a quick method, development of BBNs is time consuming.

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More information about BBN

Computer as well as appropriate BBN software (e.g. NETICA from Norsys or HUGIN from HUGIN Expert) are needed to develop the BBNs jointly. An LCD projector for larger groups is needed.

BBN software can be found at:
http://www.hugin.com/productsservices/services/training

CatPac

CatPac is a computer program that analyses text samples to identify key concepts contained within the samples. CatPac is able to identify the most important words in a text and determine patterns of similarity based on the way they are used. It produces such outputs as simple word counts, cluster analysis, and interactive neural cluster analysis.

Scope of application

Gathering information from large sets of textual data.

Method description

CatPac is a computer program that can read any text and summarise its main ideas. It has been employed especially in social sciences for analysis of political speeches, focus-group interviews and tourism-related research. The program produces a variety of outputs: word counts, frequency rankings, cluster diagrams, and interactive neural cluster analysis. Its add-on function **ThoughtView** can generate two- and three-dimensional concept maps based on the results of the analyses. A major benefit of this tool is that it does not require pre-coding. This allows themes and concepts to emerge from the data and reduces bias in the analysis. For collaborative planning purposes, CatPac could be used, for example, for analyzing open-ended question responses or recorded and transcribed interviews.

Benefits/Drawbacks

- \+ Can save time when dealing with large textual data sets
- \+ Can read any language that can be coded into ASCII or RTF
- − Allows processing just one file at a time and does not assist with data smoothing.

More information about CatPac

Allen, D. (2005): Using perceptual maps to communicate concepts of sustainable forest management. Forestry Chronicle 3: 381-386.

CatPac software (Galileo Company): http://www.terraresearch.com/

Funded by the European Commission's Leonardo da Vinci Lifelong Learning Programme

CATWOE

CATWOE is basically a checklist for thinking. It helps to identify and structure a certain problem at hand. Originally it has been presented as part of the Soft Systems Methodology (SSM) approach, although it can also be used on its own.

Scope of application

A utility to frame a clear definition of a task or situation.

Method description

CATWOE is a tool to identify and structure problem situations of a system that is under analysis. It was originally defined by Peter Checkland as a part of his problem-solving methodology called Soft Systems Methodology (SSM) (Checkland and Scholes, 1990). CATWOE helps to carry out the Stage 3 of the Soft Systems Methodology which has 7 stages in total. The aim is to formulate a root definition, a structured description of a system by analysing the system through CATWOE elements (Table 1).

Table 1: CATWOE elements

C	**Customers**, those who benefit or suffer from the operations of the system
A	**Actors**, those who can act in the system
T	**Transformation**, what the system does to change its inputs to outputs
W	**World view**, wider context of the system, or the values behind the system
O	**Owners**, those with power over the system and who can abolish it
E	**Environment,** constraints and limitations for outputs of the system

Example

CATWOE has been used in developing the Regional Forestry Programme (RFP) process in Finland (Oamk, 2012). A Soft Systems Methodology process was conducted in order to develop the RFP process, and the root definition was constructed after careful situation analysis by a group of about 10 members, consisting of RFP leaders from Forestry Centers and researchers. The root definition was synthesised as follows:

”The Regional Forestry Centre constructs together with the Regional Forest Council a Regional Forestry Programme for the Board to be accepted. Forest related interest

groups and members of the public are widely involved when the Forestry Programme is constructed. The Forestry Programme takes equally into account all relevant forest uses. The Forestry Programme is one of the public tasks of the Forestry Centre. The Ministry of Agriculture and Forestry is supervising the preparation process. The guidelines for the preparation process are jointly agreed in an annual discussion with the Forestry Centre and the Ministry.''

Table 2: CATWOE elements of the Regional Forestry Programme

C	**Customers**: the Forest Council, interest groups, members of the public
A	**Actors**: the Forest Centre
T	**Transformation**: constructing the programme, working together with the Council, consulting other parties
W	**World view**: equality and coverage
O	**Owners**: the Board, The Ministry of Agriculture and Forestry
E	**Environment:** funding agreed in yearly negotiations with the Ministry

The definition was tested with CATWOE (Table 2). A conceptual model of the Regional Forestry Programme was constructed using the elements of the root definition. The vision, the present state and development ideas were discussed and modeled with a decision hierarchy. The aim was to agree on desired and feasible actions in order to improve the Regional Forestry Programme process.

Benefits/Drawbacks

+ Permits to consider different perspectives and views of a problem.
− Does not offer a direct solution for the problem at hand.

References

Checkland, P. and Scholes, J. 1990: Soft Systems Methodologies in Action. John Wiley & Sons Ltd, New York.

Kangas, A., Kangas, J. & Kurttila, M. 2008: Decision support for forest management. Managing forest ecosystems, Volume 16, Springer.

Oulu University of Applied Sciences (Oamk) 2012: HyvAMO-project (The Regional Forest Programme as an Acceptable and Influencing Process). http://www.oamk.fi/hankkeet/hyvamo/english/

More information about CATWOE and the SSM approach

SSM presentation: http://portals.wi.wur.nl/msp/index.php?ID=109&IDsub=110

Cognitive Mapping

Cognitive mapping is a method enabling a researcher or a planner to clarify and save people's conceptions regarding their environment. These ideas are recorded in graphic form showing concepts and their interconnections. Cognitive maps help people organise and categorise various concepts. They link main ideas or thoughts with sub-ideas or sub-categories. This allows the creator and other viewers to visualise these concepts. Appropriate software can be used for cognitive mapping.

Scope of application

Gathering and visualising stakeholders' views, preferences and relationships.

Method description

The foundation of Cognitive Mapping lies in cognitive psychology, which is a discipline examining how the human being receives, records and uses information. The term 'cognitive map' was coined by E. C. Tolman (1948) when he argued that rats in a maze had an internal representation or, a cognitive map, of the environment, which would lead to the use of shortcuts in finding food. Cognitive Mapping is a method enabling a researcher or a planner to clarify and save people's conceptions regarding their environment. These ideas are recorded in graphic form showing the concepts and their interconnections (Fig.1)

A cognitive map cannot represent an entire belief system but strives to portray those beliefs that are held to be most significant by the stakeholders concerned. In this way, valuable knowledge and alternative perspectives, perhaps otherwise hidden, can be entered into the decision-making process.

Cognitive maps can be analysed through interpretive coding (where individual concepts are interpreted); in terms of their content (the meanings they contain); and in terms of the complexity of configuration of the maps (for example, link to node ratio, cluster analyses).

There are numerous approaches to Cognitive Mapping. Here is a possible approach for collaborative planning situations:

1. **Individual cognitive mapping.** Stakeholders are interviewed individually in a relatively unstructured way to try to elicit their thoughts about the problem under discussion. From this discussion cognitive maps are drawn to help each individual refine their thinking.
2. **Map combination.** Individual cognitive maps are combined into a composite map that represents the beliefs of a group. Initially the map can contain several

hundreds of concepts. Similar concepts are merged into one while maintaining a balance of concepts from all members of the group. To make the map manageable the concepts are arranged into clusters containing between 15 and 30 concepts. The final merged map is an overview map at the cluster level showing links between each cluster. This map can the serve as a focus for following discussions.

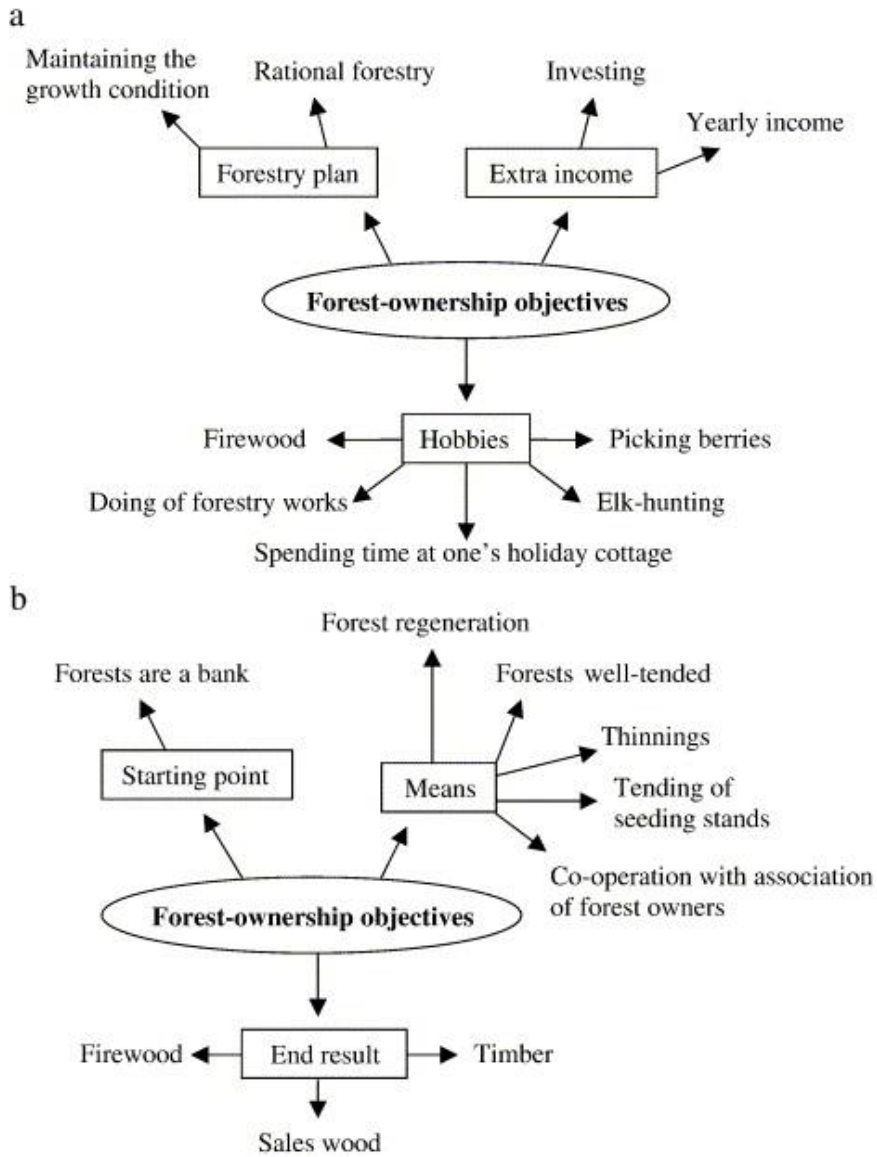

Fig. 1. ***Examples of cognitive maps*** *depicting the forest owners' objectives in a study in Finland (Tikkanen et al., 2006). (a) The cognitive map of the forest owner, who emphasised 'Hobbies' as his foremost objective. (b) Here the forest owner has grouped the objectives in such a way that they form a chain of functions taking place in the forest and of their consequences. Usually, the forest owners gave group titles depicting and connecting the objectives set for a group. In the case study, the individual cognitive maps were derived during the interviewing sessions applying conceptual content cognitive mapping approach. Maps were then coded qualitatively and finally the results from individual maps were aggregated using quantitative methods, including hierarchical clustering of objectives according to the proximity between them.*

Benefits/Drawbacks

- ✚ Effective way of looking for holistic solutions and generation of ideas.
- ✚ More versatile information can be obtained compared to information obtained through a questionnaire or other more structured enquiry methods.
- ✚ Can be perceived as less threathening than direct questioning.
- ━ Requires a skilful facilitator.
- ━ Some participants may find it difficult to draw.
- ━ Time consuming.

For more detailed explanation of this type of approach look for information about applications of cognitive mapping regularly used in operation research studies, namely Strategic Options Development and Analysis (SODA) and Journey Making.

References

Tikkanen, J., Isokääntä, T., Pykäläinen, J. and Leskinen, P. 2006: Applying cognitive mapping approach to explore the objective–structure of forest owners in a Northern Finnish case area. Forest Policy and Economics 9(2): 139-152.

Tolman E.C. 1948: Cognitive maps in rats and men. Psychological Review 55 (4): 189–208.

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Eden, C. & Ackermann, F. 1998. Making Strategy: The Journey of Strategic Management. Sage Publications, UK.

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Hjortso, C. 2004: Enhancing public participation in natural resource management using Soft OR––an application of strategic option development and analysis in tactical forest planning. European Journal of Operational Research 152: 667–683.

Design Charrette

A Design Charrette is a short, intensive session in which various stakeholders and experts are brought together to address a particular designing issue. Usually, it is an intensely focused, multi-day session that uses a collaborative approach to create realistic and achievable design ideas that respond successfully to the issues at hand. The main intention for organising a charrette is to compress the time taken to consult with various stakeholders, especially in the current climate of urgency and instant data exchange. Large crowds of participants can be divided into smaller groups.

Scope of application

Can be used to gather ideas and devise possible solutions.

Method description

'En charrette' was a term used by architecture students in 19th century Paris to mean 'to draw at the last moment' (National Charrette Institute). In recent years, the term 'charrette' has come to describe a design workshop typically consisting of intense and possibly multi-day meetings, involving, for example, planning officials, developers, and residents. Design Charrettes are typically used in architecture and urban design, but can be adapted to other purposes as well. They are most often used as a consultant tool for engaging the community in participatory workshops on potentially controversial developments.

Design Charrette can take many forms; here is a possible organisation (these activities can take a few days or a few weeks):

1. **Information exchange.** First, the participants are provided with information about the Design Charrette method and the goal of the particular charrette. Background information about the designing issue at hand are given and also gathered from the participants. The participants may be organised to smaller groups to create alternative approaches, or to focus on certain aspects of the design.
2. **A site visit** can be organised, if applicable. A site visit allows charrette participants to understand site opportunities and challenges, which will be taken into account when alternatives are developed during the charrette.
3. **Designing and reviewing.** Ideas are presented, debated, discarded and reiterated, with the group or groups gradually working towards consensus and a final resolution. A Design Charrette typically involves a great deal of drawing by everybody, regardless of any lack of formal design training. While rapid hand

drawings dominate a charrette event, other types of visualisation techniques can be used alongside sketches to explore project development. These include printed maps, plans, sections, perspectives, aerial views and elevation images. Also, graphic presentation methods including photomontage, PowerPoint, video, Skype and social networking media can help to convey information in a non-verbal form.

4. **Final resolution.** The design charrette may generate a prioritized action plan regarding the problems being addressed. It is essential that all participants understand and agree with how the results will be utilised.
5. **Presentation of the results.** After an agreed-upon plan is created, a report presenting the whole process and its outcomes is produced for wider distribution and comment. Presentations, graphic images, design standards and implementation strategies produced in a charrette provide essential documentation for the planning process.

Benefits/Drawbacks

- \+ Allows interactive learning between planning experts and local community representatives.
- \+ Can bring about innovative ideas when non-experts are invited to design.
- − Consists of several sessions, cannot be conducted in one sitting.
- − In order for the method to be truly collaborative, stakeholders need to be included throughout the design process.
- − Some people may not feel confident about their hand-drawing skills and may withdraw from designing.

References

Dawn Smith, Nicola: Design Charrette : A vehicle for consultation or collaboration (a paper published online)

National Charette Institute http://www.charretteinstitute.org/

More information about Design Charrette

Condon, P. M. 2008: Design Charrettes for Sustainable Communities, Island Press.

Discourse-based Valuation

Discourse-based valuation strives for fair and equitable valuation of common-pool resources, such as land, water and forests. The approach emphasizes the role of a free and open public debate instead of aggregation of separately measured individual preferences when valuating public goods. In discourse-based valuation, citizen groups deliberate in a structured manner about an important issue. The goal is to make consensus-based judgements.

Scope of application

Discourse-base valuation is a generic technique for organising discussions in a collaborative way. Basically, it can be applied during all stages of a collaborative process but is most appropriate as a device for decision-making.

Method description

Discourse-based Valuation consists of a series of meetings by small groups in a public forum. The goal of discourse is to reach a consensus value among the participants. Because the process is public, the discussion tends to revolve around maximizing the public good instead of benefiting individuals. Results from meeting discussions are presented to policy makers, civil society leaders and experts.

Many kinds of techniques can be used to support free and open discussion when applying Discourse-based valuation.

These are the procedural rules for fair outcome:

1. Anyone who wishes has to be allowed to participate in the discourse.
2. Each participant has to be allowed to place issues on the agenda.
3. Each participant has to be allowed to introduce his or her own assessments.
4. Each participant has to be allowed to express his/her own attitudes, needs and preferences.
5. Anyone who speaks should not be hindered by external compulsion or pressure.
6. The goal of discourse is to reach a consensus value among the participants.

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Benefits/Drawbacks

- ✚ Very flexible, suits many cases.
- ✚ Methodological issues do not prevent fair and genuine citizen participation.
- ━ Risk of open-ended discussions.
- ━ Some people might still dominate the discussion.

References

Wilson, M., and Howarth, R. 2002. Discourse-based valuation of ecosystem services: Establishing fair outcomes through group deliberation. Ecological Economics 41: 431-443. doi:10.1016/S0921-8009(02)00092-7

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Hope-map

Hope-map is a method for spatial voting, in which qualitative information obtained in a public participation process is transformed into quantitative spatial decision support for planning. It produces score maps, or hope-maps, where stakeholder opinions are illustrated on a map. Geographic information system (GIS) and preference analysis tools are required for this method.

Scope of application

This method visualises stakeholders' views and preferences by location, thus serving to structure information.

Method description

The Hope-map method is an application of spatial voting, in which qualitative information obtained in a public participation process is transformed into quantitative spatial decision support for forest management planning (Hytönen et al., 2002). First, public opinions are gathered. Then qualitative analysis is implemented by using the tools of qualitative research analysis. After this, the method proceeds to connect the expressed opinions to certain locations, to weight these opinions in a sensible way, and to combine them in the form of a **score map**, or a **hope-map**. In this phase, geographic information system (GIS) and preference analysis tools are used. The resulting hope-map ranks pixels in the planning area according to the aggregated preferences and norms expressed by stakeholders.

The method steps are:

1. Gathering unstructured public or stakeholder opinions (e.g. conducting a survey).
2. Grouping the opinions by qualitative analysis.
3. Formulating arguments with goal directions, including the strength of each argument as the number of opinions.
4. Transforming the arguments into 'planning language'.
5. Conducting GIS analysis to find geographical location for opinions.
6. Weighting the opinions spatially and plotting hope-maps showing aggregated public preferences.

What is GIS?

A geographic information system (GIS) integrates hardware, software, and data for capturing, managing, analyzing, and displaying all forms of geographically referenced information. GIS allows viewing, understanding, questioning, interpreting, and visualising data in many ways that reveal relationships, patterns, and trends in the form of maps, globes, reports, and charts.

Many planning projects benefit from GIS technology and it is very recommendable to get familiar with it.

To get an idea about GIS you can visit the GRASS free GIS software pages

http://grass.osgeo.org/

or the leading commercial GIS software suppliers ESRI pages

http://www.esri.com/

or read an introductory book about GIS:

Longley, Paul A., Goodchild, Michael F., Maguire David J., and Rhind, David W. 2010: Geographical Information Systems and Science. 3rd ed. John Wiley & Sons.

Benefits/Drawbacks

- ✚ Produces information in tangible form, as maps.
- ✚ Enables organising qualitative information into a spatial quantitative format according to its relative significance for the participants.
- ━ Quite demanding method for the planner/facilitator, requires good cartographic modelling skills.

References

Hytönen, L.A., Leskinen, P. & Store, R. 2002: A spatial approach to participatory planning in forestry decision making. Scandinavian Journal of Forest Research 17(1): 62-71.

More information about Hope-map

Kangas, J., Store, R. & Kangas, A. 2005: Socioecological landscape planning approach and multicriteria acceptability analysis in multiple-purpose forest management. Forest Policy and Economics 7: 603-614.

Influence Matrix

An Influence Matrix is a device to graphically depict the relationship between several elements that can affect the results of a decision. It allows describing the mental models of experts or managers about their perception of the strength and direction of influence of one decision element about the other.

Scope of application

Visualising dependencies within a problem setting.

Method description

Complex situations are the result of many different elements (e.g. actors, actions, factors) and the dynamics of elements and linkages. Since not only the elements, but also their relations can change over time, a large number of possible states can be reached. Due to the linkages, changes in a single element do not remain isolated, but can influence others, which leads to adaptive change throughout the whole system as well as to unintentional effects. Influence matrix allows describing the relationship between the system elements and providing a theoretical framework to interpret the clustering of the elements. The following steps should be followed:

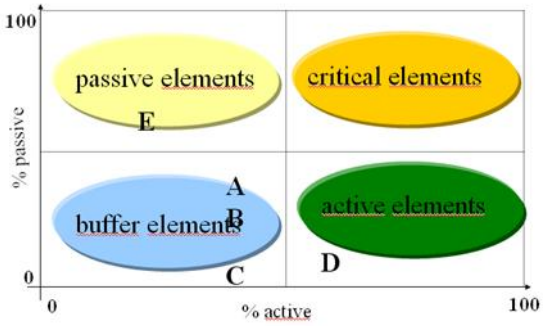
1. **Matrix formulation.** All system elements in a given problem domain (e.g. actors; land uses; actions) are listed in a matrix (Fig 1.), where the number of rows and columns of is related to the number of system elements to be analysed.
2. **Estimating the level of influence.** For each element within an influence matrix, the level of influence from one element over the other is estimated based on a scale from 1 – 3. Here the direction of the question, 'How strong is the influence of element A on element B?', is always from the elements in the row to the element in the column.
3. **The sum of the influences** is calculated for the columns and for the rows. The rows indicate the active influence, 'How much influence do the elements have on the other elements?', and the columns indicate the passive influence, 'How much are the elements influenced by the others?'.
4. **The total sum of the active and passive influences** is then used to map each element in the influence diagram. Here the total scale is related to the number of elements evaluated in the influence matrix (e.g. 5 elements, allows a total score of 12 (active and passive) points for each element).

Fig.1 and 2: Influence Matrix and its outputs.

↓ →	A	B	C	D	E	sum active
A		0	1	3	1	5
B	1		2	2	0	5
C	1	1		0	3	5
D	3	2	0		2	7
E	0	2	0	1		3
sum passive	5	4	0	1	6	

Has element A direct influence on element B?

If YES, how strong? 1 = slight, 2 = moderate, 3 = strong



OUTPUTS

The influence matrix allows clustering the system elements according to their ability to influence other elements or being influenced: buffer elements, passive elements, active elements, critical elements (Fig.2). The clusters can be interpreted as follows:

5. **Active elements**: in the lower right quadrant. Most suitable for intervention (have strong influence on the system). Much can be achieved by modifying these ele-ments towards the intended goal(s).
6. **Passive elements**: in the upper left quadrant. These elements are very sensitive to changes and need thorough impact assessments.
7. **Buffer elements**: in the lower left quadrant. Cannot be influenced much, but they themselves do not exhibit much influence on other elements either.
8. **Critical elements**: in the upper right quadrant. Changing these elements can have a significant impact on the system. There are strong feedback mechanisms involved which may lead to undesirable effects. Special attention must be given to these elements.

Benefits/Drawbacks

- ✚ Supports stakeholder analysis.
- ✚ Promotes systemic thinking.
- ✚ Helps to identify the most relevant factors in a given problem area.
- ━ Limited to a certain number of system elements (matrix becomes to large).
- ━ Does not help identifying solutions.

References

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More information about Influence Matrix

There are software tools available which allow to model the influences and the sensitivity to changes in a computer based software environment. For details refer to

http://www.frederic-vester.de/deu/sensitivitaetsmodell/

Multi-criteria Decision Analysis (MCDA)

Multi-criteria decision analysis is a generic approach for assessing alternatives in planning situations by evaluating their ratings under different criteria. Here is a description about the principles behind several different MCDA methods with a simple example. Some other methods described in this manual, namely Mesta, SMART, AHP and ANP belong to the same family of methods.

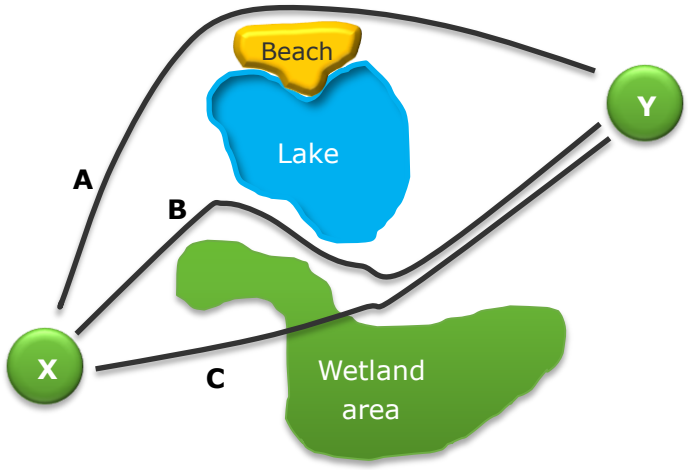
Scope of application

Helps analyse different decision alternatives and establish preferences.

Method description

1. MCDA starts with a set of possible **decisions** (alternatives, scenarios) for a planning issue. These alternatives may or may not have been created in the course of the collaborative process itself.

Example: For a road to connect the villages X and Y, three routes **A**, **B** and **C** have been proposed. The landscape between the villages includes a lake with a beach that can be accessed by bicycle only and an ecologically valuable wetland area. Amphibians migrate between the wetland and lake.



2. The second step of MCDA is to find a set of **criteria** (indicators) influenced by the decision that will mirror its quality or 'degree of fulfilment' in different aspects. In collaborative planning, the selection of criteria should be part of the collaborative process. For further refinement, they are often divided into sub-criteria.

In the above example, we may define the following generic criteria:

- **Con**servational value (How much does the solution allow for conservation issues?)
- **Hum**an benefit (What extra benefit arises from the solution for the local population?)
- **Eco**nomy (Is the solution cheap?)

Concerning sub-criteria we may distinguish, for instance, between value for plant species, animal species and biotope types in the 'Conservation' category.

3. Further, a **value range** must be defined with each criterion. According to the nature of the criterion, such a range may comprise integer or fractional numbers or just a 'yes or no' statement. It is important that numeric values should all point in one direction, i.e. a high value should indicate either the best or worst outcome with any possible criterion. At this point, the collaborative process will possibly have to deal with the question what is 'best' or 'worst' related to individual criteria.

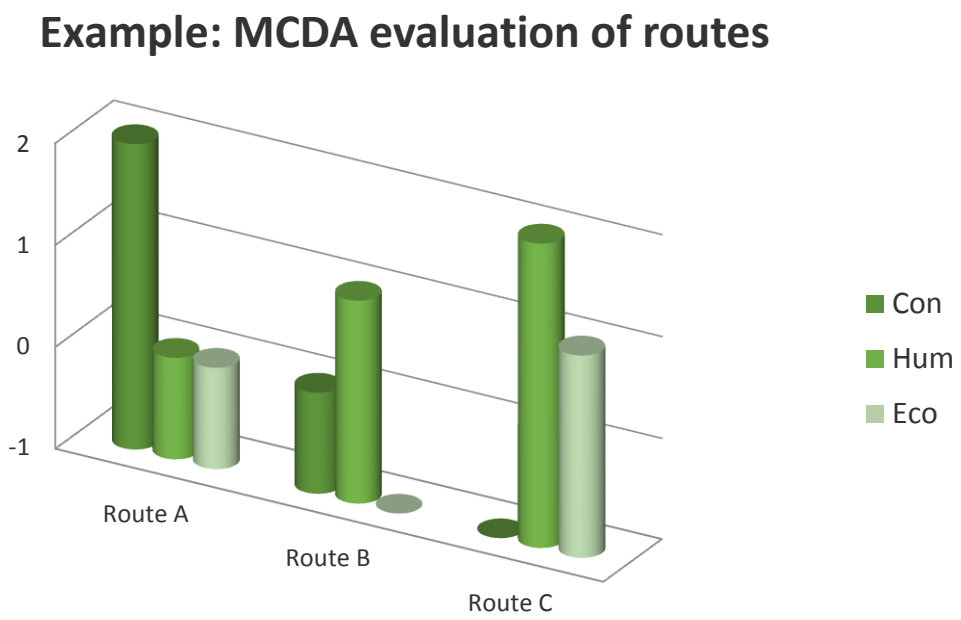
With our example, we will allow values of **-1** (low value or counteracting the purpose), **0** (neutral), **1** (medium value) and **2** (high value).

4. Then we must **assign values** to criteria, this also being part of the collaborative process. Finding an agreement on how to do this is probably the most difficult part of the method: First because there are many aspects of planning issues which can hardly be mapped to a numeric range (e.g. the beauty of a scenery), second because opinions on how to rate a given situation in comparison with others may differ considerably between stakeholders.

In our example, the 'human benefit' value of route **A** may be considered high because it makes the beach accessible more easily. At the same time, some may consider this a disadvantage because of the noise exposure of bathers, arguing that bicycle access was completely sufficient. Let us assume that the stakeholders agreed on the following values:

	A	B	C
Conservational value	2 (no ecologically sensitive areas are crossed)	0 (impedes amphibian migration, but tunnels can be built)	-1 (impairs the wetland biotope)
Human benefit	0 (has been negotiated between conflicting parties as described above)	1 (nice scenery view from the road)	2 (shortest connection)
Economy	0 (comparatively long route)	-1 (as long as route A but more expensive because of amphibian tunnels required)	1 (shortest route but more expensive where wetland must be traversed)

5. Finally, the result may be visualised in different ways.



Multi-criteria decision analysis, in its simple form, does not give an overall rating which would combine all criteria.

In our case, having the same range of values with all criteria and assuming them to be equally important, we could simply add the values of the *Con*, *Hum* and *Eco* categories for each scenario. The overall rating would then be 2 for routes A and C and 0 for route B. But the categories mirror different aspects of a problem which cannot usually be weighed against each other in such a simple fashion.

There are a number of advanced methods continuing at this point, trying to provide solutions to the mathematical representation of the problem: an optimisation task in a multi-dimensional space. This implies introducing weighing algorithms for different criteria.

Even without an overall rating, MCDA can give a good impression of how different alternatives cope with different challenges of a task.

SUMMARY

Summarised, the steps with simple MCDA are these:

1. Collect possible solutions to your problem (scenarios).
2. Find all criteria that will determine the value of a solution.
3. Conceive a rating for each criterion by defining a value range and the meaning of values.
4. Assign values to criteria with all scenarios investigated.
5. Visualise ratings.

Benefits/Drawbacks

- \+ Gives a structured approach and quick overview of the rating of alternatives under different criteria.
- \+ Necessarily entails a discussion about how to rate criteria which can be even more important than the result itself.
- − The visually plausible shape of the result may be misleading because MCDA involves a lot of simplifications.
- − The quality of the result is limited by the grade of fidelity in conceiving criteria and rating procedures.

More information about MCDA

Keeney, R.L. & Raiffa, H. 1993: Decisions with multiple objectives. Preferences and value tradeoffs. Campridge University Press, Cambridge, Massachusettes.

Kangas, A., Kangas, J. & Kurttila, M. 2008: Decision support for forest management. Managing Forest Ecosystems 16. Springer. 222 p.

Mesta

Mesta is both a method and internet application that can be used for selecting one alternative among a set of alternatives in a multi-objective decision-making situation. It can be used by a single user individually but is also suitable for a participatory decision-making situation with a limited stakeholder group.

Scope of application

This method can help estimate the feasibility of solutions according to participants' preferences.

Method description

Mesta is a generic method and an internet decision-support application suitable for participatory planning situations developed by the Finnish Forest Research Institute (Metla) (Hiltunen et al., 2009). Before applying the method, decision criteria and a limited number of alternatives have to be produced. In forest planning situations alternative plans can be created e.g. by using GIS operations, linear programming or other available optimisation methods. By using Mesta, participants can evaluate a limited number of alternatives and make a decision about the preferred alternative. The properties of each alternative are described numerically, i.e. each alternative has a numerical value against each criterion.

The Mesta web application provides an interface where users can detect all the criteria (bars in Figure 1) and the values of alternatives (squares in each bar). Participants can interactively reduce the alternatives considered feasible by defining 'acceptance thresholds' (thick black lines in the Figure 1) that divide the alternatives into 'acceptable' and 'not acceptable' against each criterion. The thresholds are adjusted holistically, so that all decision criteria and criteria values of all alternatives are simultaneously visible on the user interface. When having finished this step, users can press the 'Show situation' button (not visible in Figure 1) and the application will analyse the current situation and show which, if any, of the alternatives are acceptable with respect to all criteria. The adjustment process continues until a solution that is accepted with respect to all criteria is found.

In participatory planning situations, Mesta includes two phases:

1. Each participant uses Mesta individually and defines the alternative that is the most suitable for her/him.
2. The results from the first phase are collected and reported to all participants. For example, the participants can be informed which alternatives became selected and by how many participants. After this, the Mesta application can be used to

support the group's negotiation process. The negotiation process can start from the mean acceptance threshold values and the participants can go through criteria and try to agree if it is possible to lower the acceptance threshold of some criteria so that new alternatives become acceptable.

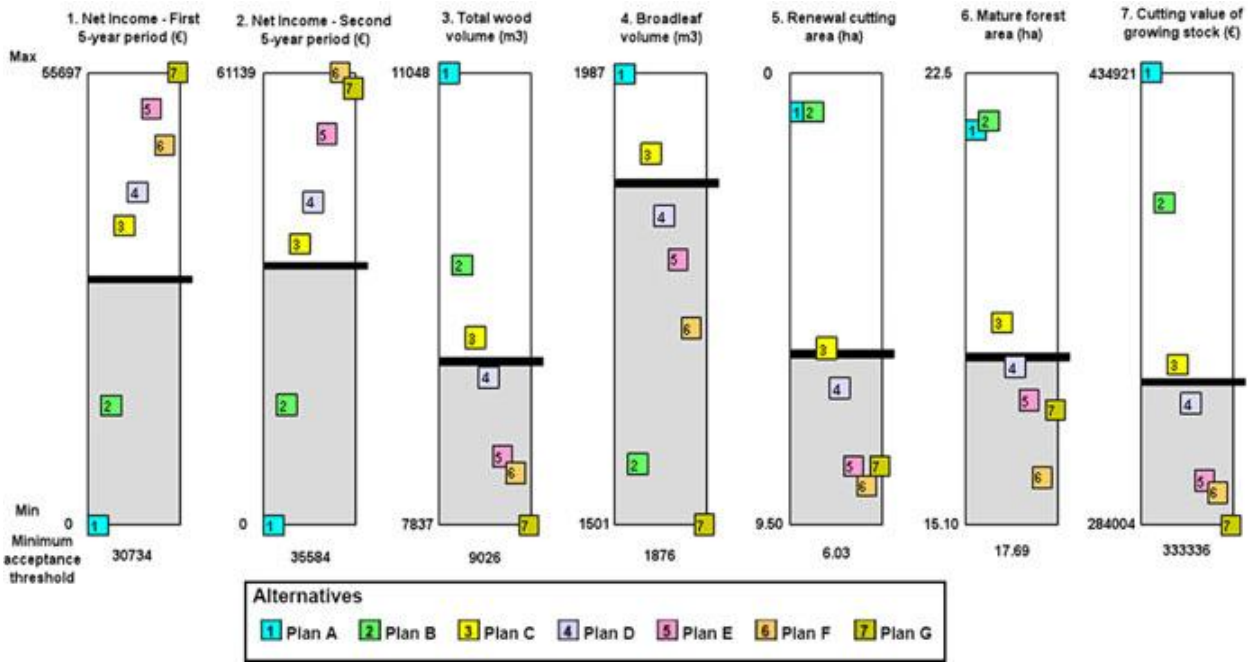


Figure 1: The user interface of the Mesta internet application. The thick black lines divide the value ranges of each criterion into 'acceptable' and 'not acceptable'. The user can move the black line with a computer mouse according to his/her preferences. In the situation shown in the figure, only plan C (3) has been accepted, i.e. all the yellow boxes that show the outcome of plan C with respect to the decision criteria appear to be in acceptable range (Eyvindson et al.2011).

Benefits/Drawbacks

- \+ Easy-to-use user interface where all information is visualized at the same time.
- \+ Supports individual evaluation and group negotiations.
- − Alternatives need to have numerical values for each criterion.
- − The number of alternatives and criteria is limited, preferably less than 10 criteria and less than 30 alternatives.

References

Eyvindson, K., Kurttila, M., Hujala, T. & Salminen, O. 2011. An internet-supported planning approach for joint ownership forest holdings. Small-scale Forestry 10(1): 1-17. http://dx.doi.org/10.1007/s11842-010-9123-1

Hiltunen, V., Kurttila, M., Leskinen, P., Pasanen, K. & Pykäläinen, J. 2009. Mesta: an internet-based decision-support application for participatory strategic-level natural resource planning. Forest Pol. Econ. 11(1): 1-9. doi:10.1016/j.forpol.2008.07.004

More information about Mesta

The Mesta internet application: http://www.mesta.metla.fi/index_eng.cfm

Nominal Group Technique (NGT)

Nominal group technique (NGT) is a simple decision-making method. It is essentially a structured discussion within a small group of participants (9-12) designed to generate and prioritise ideas about a particular topic. Prior to group discussions and ranking, participants are asked to write down their ideas silently and independently in order to encourage everyone‘s participation.

Scope of application

This method can be used to gather and evaluate ideas.

Method description

Nominal group technique evolved from organisational planning research and was developed by Andre Delbecq and Andrew van de Ven in 1968 (Delbecq et al., 1975). It is a group session with a moderate number of participants (9-12) and has similarities with a method called Focus Groups. However, discussion in a nominal group is more structured and the result is a list of preferred alternatives.

Variations of this method exist and, for example, alternatives do not always have to be ranked, but may be evaluated more subjectively.

A Nominal Group meeting typically deals with a **single topic** and consist of **six stages**:

1. **Presenting the problem**/question to be answered. The problem has to be explained thoroughly, so that every participant really understands what they are working on.
2. **Brainstorming**. Participants are asked to write down all the ideas/solutions that come to their minds in 5 minutes. The writing is done individually and silently, so that everyone has a change to think and express their own personal point of view.
3. **Documentation**. In documentation rounds, each participant is asked to present their ideas one at a time. The facilitator numbers the ideas and writes them on a board or a flip chart exactly as stated by the participants. At this point, discussion should be limited.
4. **Consolidation** and review of ideas. After all the ideas/solutions have been documented, they are arranged together with the participants. Similar ideas can be grouped and all duplicated ideas are identified and discarded. At this point, discussion is encouraged and all unclear issues clarified. Possible new arising ideas/solutions are recorded and taken into consideration as well.

5. **Ranking.** The recorded ideas are prioritized in relation to the original issue/problem. This can be done by voting or using some other suitable method. For example, Acceptance voting is a simple voting method suitable for this stage.
6. **Compilation of results.** The scores are summed and the most preferred alternatives identified. The session should end with a discussion to ensure that a consensus has been reached.

Benefits/Drawbacks

- \+ Ensures relatively equal participation.
- \+ Simple and quite quick method.
- \+ Results in a tangible list of prioritized ideas or solutions.
- \+ Writing individually usually generates more ideas.
- – Limited to a single topic – only one problem at a time.
- – Some participants may find it difficult to express themselves in writing.
- – Structured and not very flexible.

References

Delbecq, A.L., Van de Ven, A.H., & Gustafson, D.H. 1975: Group techniques for program planning: A guide to nominal group and delphi processes. Glenview, IL: Scott, Foresman and Company.

More information about NGT

Clark, J.K. & Stein, T.V. 2004: Applying the Nominal Group Technique to Recreation Planning on Public Natural Areas. Journal of Park and Recreation Administration 22(11):1-22.
http://www.sfrc.ufl.edu/faculty/stein/Publications for Website/Applying Nominal Group in Florida.pdf

Planning for Real

The Planning for Real method uses simple models as a focus for people to put forward and prioritise ideas on how their area can be improved. It is designed to provide a hands-on, non-threatening experience to community members. Participants lead the process while expert staff are available to answer any questions. The number of participants in one event shouldn't exceed 50.

Scope of application

Planning for Real mainly serves to gather participants' opinions and suggestions. It deals with a whole planning project by means of a model.

Method description

The Planning for Real method, developed originally by the Neighbourhood Initiatives Foundation Foundation (NIF), is a group involvement technique for soliciting suggestions and opinions from community members. In a workshop setting, participants use a **3D model of the planning area** which is constructed from cardboard and polystyrene by the participants themselves or local school children. On this model, participants put cards or other symbols representing issues, problems or suggestions for actions that they would like to see. Group meetings follow this session to sort out and prioritise the suggestions so that a profile of community needs can be drawn up. The actual equipment can be very simple, and the rules for running the method are also very basic and flexible. However, it is important that the participants lead the process while expert staff are available to answer any questions.

Forests for Real is an adaptation of Planning for Real using options cards specifically related to forestry issues.

Note: The Planning for Real® process is a registered trademark of the Accord Group. Organisations wishing to run Planning for Real® events, or to describe themselves as users of a Planning for Real® approach, should first contact the Accord Group to discuss using the technique to its full effect and to obtain permission for the use of the trademark.

Typical Planning for Real process steps:

1. **Initiation** and area definition. Setting up a Steering Group.
2. **Constructing the model**. A collective exercise by the Steering Group, often with school children or students. Usually to a scale of 1:200 or 1:300 - which allows people to identify their own homes - and in sections so that it is easily transportable.

3. **Publicising activity.** The model is taken around the area to generate interest.
4. **Rehearsing session.** The process is run through with the Steering Group.
5. **Open sessions** for the local community members. One or several times in different locations.
    a) People gather around the model. Introduction by facilitator explaining the process and its objectives.
    b) Participants individually place suggestion cards on the model. Some should be ready-made suggestion cards and some with blanks for people to add their opinions and ideas. The use of colour and visual symbols makes the process accessible to those with low literacy skills. Professionals watch and answer questions but do not take part. Participants discuss the results and rearrange cards until they are collectively happy with the result.
    c) Participants record results, usually on priority cards setting out the suggestion and its location.
    d) Participants prioritise suggestions by placing priority cards on Now, Soon or Later boards and identifying who should take action.
    e) Discussion on next steps and establishing working parties on the main issues. (20 mins)
6. **Working parties**. Follow up suggestions.
7. **Feedback.** Circulation of newsletter.

Benefits/Drawbacks

- ✚ With suggestion cards participants can express ideas without being articulate or self-confident.
- ✚ Appeals to people of all ages. Fun and eye-catching.
- ━ Requires a fair amount of preparation time and execution time (several weeks).

References and more information

Planning for Real (The Accord Group) http://www.planningforreal.org.uk/

Scoring

Scoring serves to weigh the importance of individual goals and criteria related to complex decisions. It is often used in connection with more sophisticated methods of evaluation and rating such as MCDA.

Scope of application

Helps integrate stakeholders' preferences and suggest favoured solutions.

Method description

Scoring is part of evaluation and rating methods. It aims at establishing factors of significance for individual criteria or sub-goals within a more comprehensive system.

As an example, the importance of a woodland area shall be rated from different stakeholders' perspectives.

1. As a first step, sub-criteria of importance must be defined, each one representing a particular function of the area. Table 1 shows a simplified example of five criteria, whereas in practice the number will often be higher.
2. Stakeholders are then asked to put a weight on each of them from their individual perspective. For that purpose, every participant is allowed a total number of points (e.g. 100) to allocate to individual criteria. The more points a criterion receives, the higher the importance in the eyes of the participant. The allocation of points should be performed in a ballot procedure rather than as group work in order to avoid stakeholders influencing or manipulating each other.

Table 1: Example of a simple scoring result

Criterion / Stakeholder	Timber harvest	Recrea-tional value	Ecosystem function	Climate-balancing function	Soil conser-vation	Sum
Forestry	40	10	30	10	10	100
Conservancy	0	10	50	20	20	100
Tourism	20	40	20	20	0	100
Sum	60	60	100	50	30	300
Average	20	20	33,3	16,7	10	100

3. Finally, individual scores are added per criterion and divided by the number of participants to arrive at average values representing the group's collective preferences. The result may be discussed and revised by the group if necessary.

Benefits/Drawbacks

- ✚ Due to everyone's equal vote, scoring in a group can increase the acceptance of evaluation results.
- ✚ The method is more objective than a rating performed by a single person.
- ➖ The result depends on the selection of stakeholders.

References

Sheil, D. and Liswanti, N. (2006): Scoring the importance of tropical forest landscapes with local people: patterns and insight. Environmental Management 38: 126-136. http://www.springerlink.com/content/p413465746536731/fulltext.pdf

Sheil, D., Puri, R., Wan, M., Basuki, I., van Heist, M., Liswanti, N., Rukmiyati, Rachmatika, I. and Samsoedin, I. (2006): Local people's priorities for biodiversity: examples from the forests of Indonesian Borneo. Ambio 35: 17-24.

Sheil, D. et al. (2004): Exploring biological diversity, environment and local people's perspectives in forest landscapes. CIFOR, Bogor, Indonesia. http://www.cifor.org/publications/pdf_files/Books/BKristen0601.pdf

Simple Multi-attribute Rating Technique (SMART)

Structuring complex problems well and considering multiple criteria explicitly lead to more informed and better decisions. Simple Multi-Attribute Rating Technique (SMART) is a method for weighting alternatives and supporting decisions. It is similar to Analytic Hierarchy Process (AHP) main difference being that no pairwise comparisons are conducted. SMART weighting can be done is a small group/s or individually combining the results in the end.

SMART results in numerical values for the decision alternatives. These values describe the preference of the alternatives and support decision making.

Scope of application

The method serves to assess and weigh decision alternatives.

Method description

SMART (Simple Multi-attribute Rating Technique) is a relatively simple method of multiple criteria decision analysis, developed by Edwards in 1971 (Edwards, 1997). There are several methods based on direct evaluation in the **family of SMART methods**, of which various researchers have developed new versions over the years.

Before starting to use SMART, the objective, the decision criteria and the alternatives have to be defined. SMART uses direct rating which means that numerical values are assigned directly to criteria to indicate their importance. Correspondingly, choice alternatives are assessed with respect to each decision criterion by simply giving them relative numerical values depicting their priority. When the importance of the individual criteria and the priorities of each of the alternatives with respect to each of the criteria have been determined, SMART can be used to perform the same computations as when using Analytic Hierarchy Process (AHP). Overall priorities of the alternatives can also be calculated by differently weighting the different participants' criteria and opinions.

These are the steps for a simple SMART:

1. **Structuring the problem.** It can useful to structure the problem first by forming a decision hierarchy (Fig.1). In the hierarchy, the objective will be in the highest level of the hierarchy and in the next level (or levels) are the criteria. In the lowest level are the decision alternatives. The criteria and alternatives should not be described vaguely or ambiguously, all the participants should understand them the same way. **Note:** the number of decision criteria and alternatives should be quite low, preferably less than 10.

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2. **Assigning weights to the criteria.** Weighting can be done using paper forms, prepared Excel sheet or special software. A small group can do the weighting together (large number of participants can be divided into several small groups) or individually. It is possible to combine individually conducted SMART weightings in the end. Usually, the weighting part is started by selecting the most important criterion and assigning it 100 points. Then the other criteria are evaluated against the most important criterion and assigning them points within the range of 0-100 (it is possible to assign same amount of points to two or more criteria if they are considered equally important).
3. **Assigning weights to the alternatives**. Applying the same principles, values are assigned to the decision alternatives in relation to individual criteria, the best alternative is assigned 100 points, and the others points between 0-100 depicting their ranked relationships.
4. **Numerical values as results.** When the importance of the individual criteria and the priorities of each of the alternatives with respect to each of the criteria have been determined, the same computations as when using AHP can be conducted. Overall priorities of the alternatives can also be calculated by differently weighting the different participants' criteria and opinions. Results are tangible, numerical values which can converted to percentages and used in allocating budget, for example.

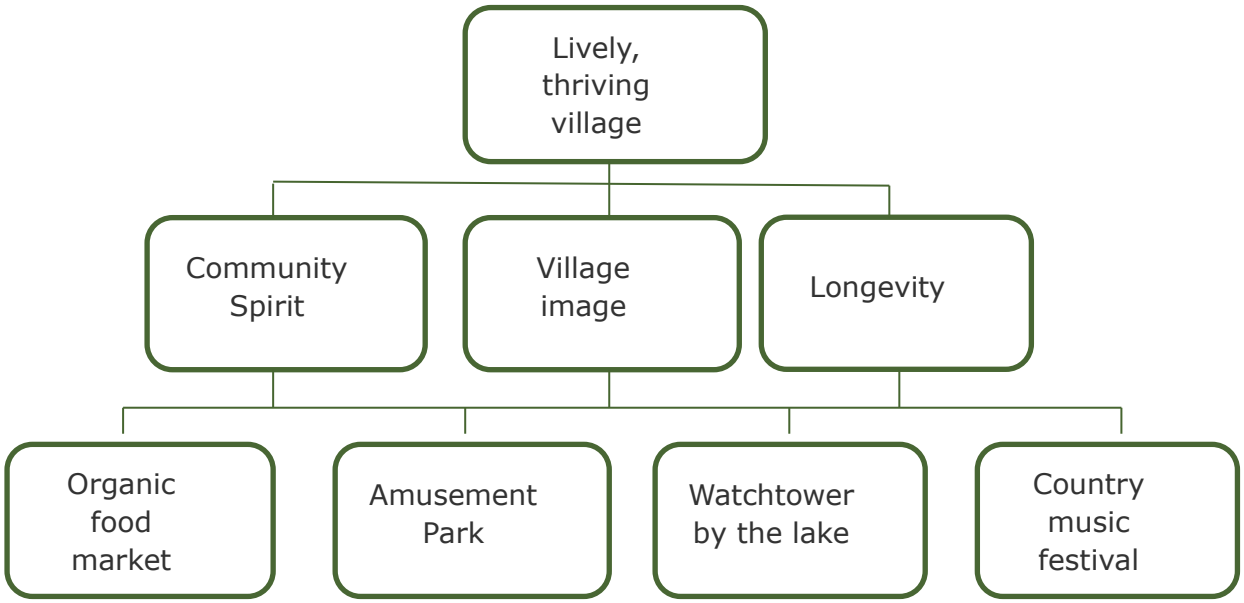


Figure1: An example of a decision hierarchy. In the top level is the objective, in the middle level the criteria and in the lowest level the decision alternatives.

Benefits/Drawbacks

- ✚ Relatively simple and straightforward method.
- ✚ Helps structuring a decision problem.
- ✚ Results are tangible, numerical values.
- ➖ Requires some mathematical understanding from the planner/facilitator.
- ➖ The rationale behind the method should be thoroughly explained to the participants and this can take time.

References

Edwards, W. 1997: How to use Multiattribute Utility Theory for Social Decision Making, IEEE Trans. Systems Man, Cybern. 7, 326-340, 1997.

More information about SMART

Kajanus, M., Kangas, J. & Kurttila, M. 2004: The use of value focused thinking and the A'WOT hybrid method in tourism management. Tourism Manager. 2: 499–506.

Stakeholder Analysis

Stakeholder Analysis is a method for planners to systematically identify all relevant stakeholders and assess their impact on a planning process.

Scope of application

Mainly to be used during the 'problem identification' phase. However, stakeholder analysis can be conducted subsequently through all stages of a project to redefine positions in case of changes to the participants' attitudes, interests or relationships.

Method description

Stakeholders are all persons or parties directly or indirectly affected by a planning process or having an interest in its outcome. Under this generic definition, stakeholder interests can be as different as to support and promote or to impede projects. Along with identifying these interests, it is helpful in a planning process to analyse relationships, strategic partnerships and networks that already exist between stakeholders.

Stakeholder analysis was first used in commercial project management and business administration to identify prospective supporters or adversaries of a project. Stakeholders in this context are seen in the first place as beneficial or hostile outsiders whose capacities to either promote or hinder a process must be assessed. The goal was to develop strategies for communication and interaction with those parties (which does not necessarily mean to cooperate).

In collaborative planning stakeholders are meant to be *part* of the process. The division between stakeholders is more likely between those who affect (determine) a decision or action and those who are affected (whether positively or negatively). The distinction may not be absolute, however, as some groups (e.g. local people) may be involved in natural resource management in both active and passive ways.

Stakeholder analysis is a tool to

- figure out other participants' interests,
- assess those parties' weight in the process, their influence, needs, dependencies and relationships,
- analyse and, to some extent, anticipate their attitudes and actions,
- identify possible sources of conflict.

The method makes it possible to identify conflicts early and develop strategies to turn adversaries into partners.

There are various techniques for conducting Stakeholder analysis but typically it includes these three steps:

1. **Identifying** all relevant stakeholders
2. Analysis of stakeholder **interests and stances** towards the subject of the planning process
3. Analysis of stakeholders' **relationships** (conflicts, compliances, dependencies)

The first two steps are best performed by setting up a **stakeholder matrix**. This is a table comprising all stakeholders and assessing how they respond to certain criteria, eventually resulting in a recommendation how to proceed in negotiations with them.

Table 1: Template for a stakeholder matrix

Name and function	Crit. 1	Crit. 2	Crit. 3	…	Recommendations
Forest owner	…	…	…	…	…
Conservation authority	…	…	…	…	…

There have been various attempts at defining the range of criteria to use. The following proposal is somewhat tailored to collaborative planning and is built so as to permit reasoning from causes to consequences while one proceeds from the left to the right side of the table.

Criteria may first include the following qualitative ones which will have to be circumscribed textually:

- **Gains:** How can the stakeholder possibly benefit from the project?
- **Support:** What kind of support can be expected from the stakeholder?
- **Losses:** Which disadvantages can grow from the project for the stakeholder?
- **Resistance:** What kind of resistance can be expected from the stakeholder?

As a result, an **Expectations** column may describe what kind of contribution (positive or negative) you expect the stakeholder to give.

Then there are some more quantitative criteria which allow for comparison:

- **Power:** How strong is the influence the stakeholder can exert over the planning group?
- **Needs:** How much does the stakeholder depend on the project?
- **Control:** How strong is the influence the planning group as a whole has on the stakeholder?
- **Dependency:** How much does the planning group depend on the stakeholder?

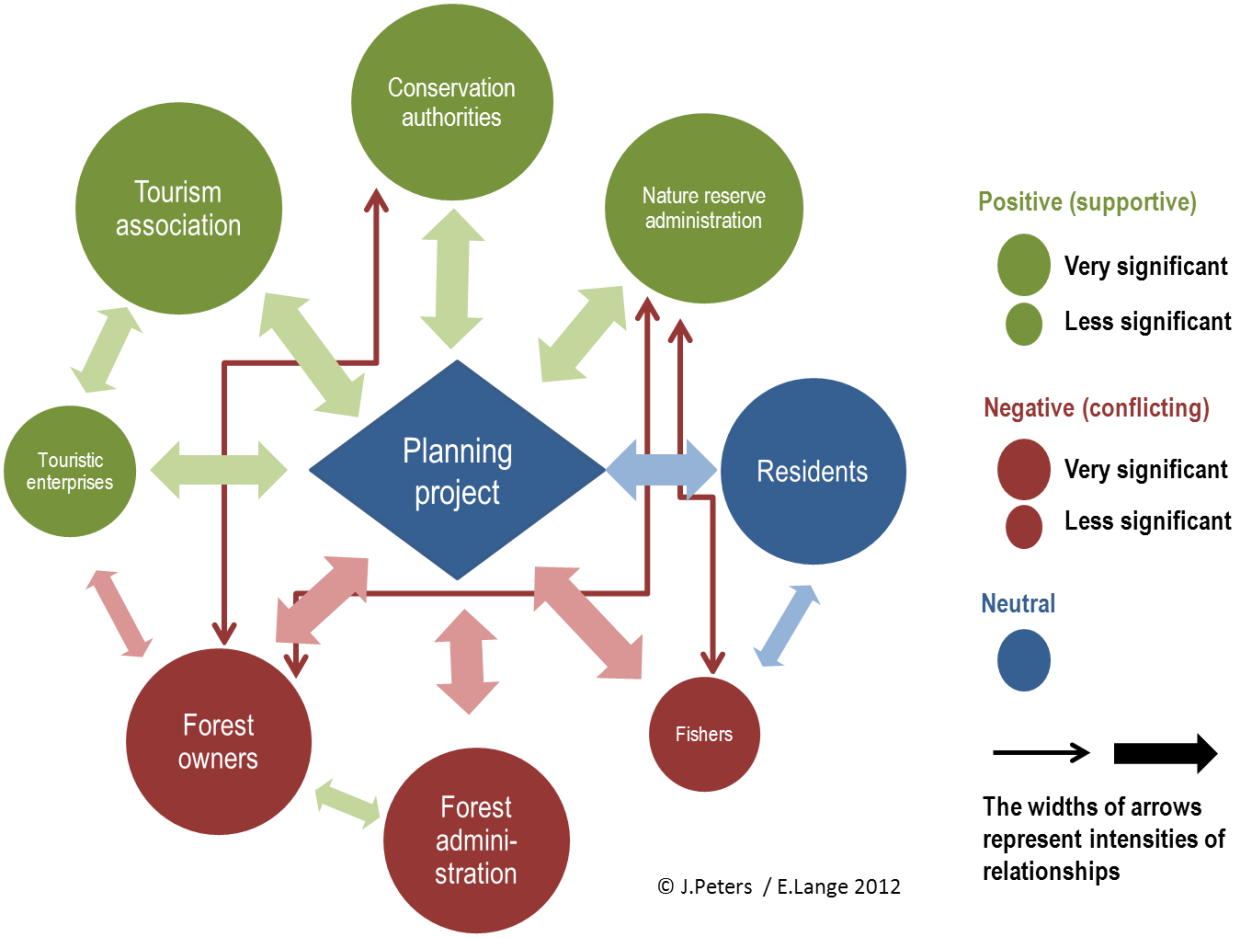
A final column named **Recommendations** may state how you intend to proceed with regard to that stakeholder. Although the idea of collaborative planning is that stakeholders communicate on an equal-rights basis, the process will not always work

under that lofty egalitarian approach. It may sometimes be necessary to develop communication strategies, for instance to avoid a powerful stakeholder exerting too much pressure on the group which would, in its turn, destroy the collaborative atmosphere.

The first two steps of identification and analysis of interests and stances can be accomplished by a survey of key stakeholders (e.g. mayors and other officials) who can involve more stakeholders through a pyramid scheme. Structured or semi-structured interviews can give more information on the stakeholders' interests and stances.

For the third step it can be helpful to draw a chart describing stakeholders' relationships. An example is shown in Fig. 1.

Fig. 1: A stakeholder chart



Note that this analysis of relationships has some correlation with the above Power/Needs/Control/Dependency part of the stakeholder matrix. The criteria may become easier to establish when viewing a graphical representation of relationships which, in its turn, depends on some preliminary thoughts on the above criteria.

Benefits/Drawbacks

- ✚ Permits systematic identification of stakeholders and their roles unbiased by personal communication patterns.
- ✚ Permits to identify possible conflicts at an early stage.
- ➖ Stakeholders' roles and properties are snap-shot assessments and may change during the process. To cling to a matrix of properties once established may be misguiding.

References

Grimble, R. (1998). Stakeholder methodologies in natural resource management. Natural Resources Institute, The University of Greenwich. www.commdev.org/files/2011_file_BPG02.pdf

Rastogi, A, Badola, R., Hussain, S.A. and Hickey G.M. (2010): Assessing the utility of stakeholder analysis to Protected Areas management: The case of Corbett National Park, India. Biological Conservation 143(12), pp. 2956-2964.

Surveys

Surveys provide an effective tool for exploring public opinion. In surveys, a representative random sample of people are selected and their opinions are enquired by mailing out questionnaires or by interviewing them face to face or on the phone. Nowadays, also many online survey platforms are available and new, more effective surveying methods are constantly being developed. Survey questions are usually structured and therefore easy to analyse quantitatively.

Scope of application

Obtaining information about participants' views and opinions.

Method description

Different kinds of surveys can be used to support collaborative planning processes. Surveys can elicit public opinions in many phases of the planning process but are especially useful in the initial stages of the process, when they can help obtaining an overview of opinions about a specific problem. They can be successfully used when gathering information about a planning area, e.g. enquiring which values people attach to the area or what their expectations for the site management are.

It is very important to spend a considerable amount of time setting the goals for the survey and structuring the questions. Sometimes it is a good idea to ask a professional sociologist, a statistician or survey expert to help with the survey and question design.

Basic steps of a survey:

1. Clear **definition of the goals** of the survey. Why is the survey conducted? What, specifically, will be done with the survey results, how are they going to be analysed? How will the information gathered improve the planning process?
2. **Decision about which type of survey** is going to be used, a questionnaire or an interview (Table 1). With questionnaire you might be able to reach more people but with interviews you usually get more precise information. How are the questions delivered? By mail, e-mail, online, face-to-face or on the phone?
3. **Composing the questions**. Questions can be closed or open ended where there are no specified answer choices. Multiple choice questions can be used or rank order scale questions that require the ranking of potential answer choices by a specific characteristic. **A tip:** Images and maps can be used as a basis for an interview or a questionnaire - people can visualise the problem better and the atmosphere can be more relaxed than with only written questions.

4. **Testing of the questionnaire/interview** on a small sample group (to find out about the required time, comprehensibility etc.).
5. **Conducting the survey** according to plan.
6. **Data analysis** – Statistics, interpretation, conclusions.

Table 1: Differences between the most common methods – a structured interview and a questionnaire.

Interview	Questionnaire
Very laborious and costly method of data collection.	A highly efficient technique, which can include a large number of individuals with relatively low costs.
Highly time-demanding.	Relatively easy for obtaining information from a large number of individuals in a relatively short time.
Can require co-operation of a rather large number of at least partially trained interviewers working in the field.	Assistants in the field are necessary only sometimes (personal distribution and collection). Low requirements for their training.
Survey on a spatially dispersed sample group is costly.	Costs of survey on a dispersed group are relatively low.
The anonymity of the survey may not be convincing enough.	Anonymity for respondents is convincing.
Differences between the surveyors and the differences in their behaviour can result in "interviewer bias".	Distortion of the meaning of an answer is practically ruled out – no interviewer is present.
The interview is less demanding in terms of the respondent's initiative, it is more difficult for the respondent to skip answers to some questions.	A questionnaire poses high demands on the willingness of the respondents; it is easy to skip questions or not to answer at all.
In the interview it is almost sure that the interviewed person belongs to the selected sample group.	In the case of a questionnaire it is possible that the answers are given by a 'wrong' person.
The share of successfully completed interviews is high.	Recoverability is generally rather low.

Some simple rules how to succeed with public surveys:

- Ask both men and women. Ideally, the share of male and female responses should be 50–50.
- Try to cover all age groups.

- Firstly, introduce the purpose of the survey shortly and clearly.
- Explain why the answers matter – why should people bother to spend their precious time answering the questions. Estimate the time it is going to take them to answer the questions.
- Keep questions short and easy to understand. Keep the overall questionnaire short enough.
- Thank your participants after they have completed the survey.

Benefits/Drawbacks

- ✚ A well conducted survey can bring about inspirational ideas and suggestions.
- ✚ If the information gathered during the survey is truly taken into account in planning, the planning decisions can be more acceptable to the public.
- ━ Time consuming, in order to obtain quality data, the process cannot be hurried.
- ━ Not an adequate measure on its own for a planning process to be called collaborative.

References

Fink, Arlene 2009: How to Conduct Surveys - A Step-by-Step Guide. Fourth Edition. SAGE Publications, Inc. ISBN 9781412966689.

More information about surveys

American association for public opinion research - www.aapor.org

A web-based tool to create and distribute your own survey: Survey Galaxy www.surveygalaxy.com

SWOT Analysis

SWOT analysis is a widely used planning tool which helps to identify the **S**trengths, **W**eaknesses, **O**pportunities, and **T**hreats involved in a project or in an organisation. It involves specifying the objective of the organisation or project and identifying the internal and external factors that are supportive or unfavourable to achieving that objective. SWOT is often used as part of a strategic planning process.

Scope of application

Mainly analysing one's own position at the beginning of a planning process.

Method description

SWOT analysis was devised by the American business and management consultant Albert S. Humphrey in the 1960s (Humphrey, 2005). Nowadays, it is a widely used planning tool which helps to identify significant internal factors (strengths and weaknesses) and external factors (opportunities and threats) involved in a project or in an organisation. It can also be used for personal development planning.

Although SWOT analysis may first seem like a simple model and easy to apply, to conduct it properly, so that it is both effective and meaningful, requires time and a significant resource. A true SWOT analysis cannot be done effectively by just one person and it requires a team effort.

SWOT analysis can be used in collaborative planning situations. Small groups should be formulated if there are many participants. With large groups it is more likely for some people to withdraw from discussion. The resulting SWOT analyses from the groups can be compiled together in the end.

The key steps in conducting a SWOT analysis include:

1. **Preparation.** The objective of the SWOT analysis should be stated clearly. A box can be drawn on a flip chart or whiteboard, or on a piece of paper, and divided into four equal sections. Alternatively, the analysis may be conducted with computers using appropriate software or a spreadsheet program (e.g. Excel). Each section should be labelled as follows: Strengths, Weaknesses, Opportunities and Threats (Table 1).
2. **Brainstorming lists of SWOT factors**, strengths, weaknesses, opportunities and threats. The factors listed should be specific, not vague or ambiguous. In order to generate lists of useful information, meaningful questions have to be asked and answered. It is important to remember to keep the focus internal for strengths and weaknesses, and external for opportunities and threats.

3. The complete lists of SWOT factors within each category are then examined and factors are reduced to the top 5 to 10 ideas (per category).
4. Each category is reviewed separately and each factor is discussed and its potential implications to the organization are considered.

Table 1. A SWOT matrix is usually depicted as a square divided into four quadrants. As an example, inside the quadrants are possible meaningful questions for an organisation

	Positive Factors **Helpful to achieving the objective**	**Negative Factors** **Harmful to achieving the objective**
Internal factors	**Strengths** What are your advantages? What do you do well? What relevant resources do you have access to? What do other people see as your strengths?	**Weaknesses** What could you improve? What do you do badly? What should you avoid?
External factors	**Opportunities** Where are the good opportunities in front of you? What are the interesting trends you are aware of?	**Threats** What obstacles do you face? What is your competition doing? Are the required specifications for your job, products or services changing? Is changing technology threatening your position?

Benefits/Drawbacks

- ✚ Easy to understand and quite quick to conduct.
- ✚ Flexible, can be used in many situations.
- ✚ Can be used as a starting point, as an icebreaker for further discussions.
- ━ Includes no means of determining the importance of the SWOT factors or of assessing the decision alternatives with respect to the factors.

References

Humphrey, Albert 2005: SWOT Analysis for Management Consulting. SRI Alumni Newsletter Dec 2005 (SRI International).

More information about SWOT

SMARTDRAW SWOT analysis software:
http://www.smartdraw.com/specials/swotanalysis.htm
(given here as an example, the are numerous other options available)

Visioning and Pathways

Visioning and Pathways are a pair of creative techniques to develop a long-term group vision and strategies to reach that vision. During Visioning exercises, participants think about their ideal future, discuss the possibilities, and ideally come to a consensus. During Pathways, participants develop specific strategies and action plans to reach a desired future. This method cannot be rushed through, it requires several days for preparation and execution.

Scope of application

A technique for organising group discussions about values, preferences and ways of decision-making.

Method description

The method is based on the Future Search methodology created in the 1980s which grew from a commitment to democratic ideals and a belief that local people should manage their own planning. The method was adapted from business visioning and planning techniques developed in Trist and Emery's Search Conference (Holman and Devane 1999). In collaborative planning approach, the method comprises the following elements:

1. **One day workshop/s** are held with stakeholder groups, with 10-25 participants participating in a single workshop. Separate workshops can be held with different stakeholder groups, but a **final combined group workshop** is important.
2. The facilitator in the workshop provides an opportunity for the participants to develop **a shared ideal future**. The ultimate goal is to encourage long-term thinking. Visioning part should create a consensus vision of an ideal future, although breakout groups might create their own visions separately first. A voting can be arranged to determine the most important aspects of the vision. The vision might have various focuses: a community, a region, a natural resource, a protected area. The vision produced can be written narratives, drawings, maps, models or combinations of all.
3. Based on the vision created, strategies are then developed to move towards those desired future conditions. Usually a second workshop has to be arranged for this purpose. All participants are now asked to express 'pathways', their **ideas for developing strategies** to make the desired future a reality. Those actions are then rearranged in a simple planning structure. Pathways part generates step by step written plans to reach a desired condition, specifying 'How, Who and When' to implement each step.

The method can be used

- for long term community development or natural resource use planning,
- to prepare proposals for projects,
- to decide how to distribute the benefits of a natural resource management plan,
- if a community is facing changes, uncertainties or problems,
- when there is little thinking or planning for the future.

The method should not be used if there is not enough time for preparation or if there is no decision-making structure that will use the results.

Benefits/Drawbacks

- \+ Encourages thinking about and planning for the future.
- \+ Provides an easy-to-use process for developing specific strategies to reach goals.
- − Requires an experienced, dynamic facilitator.
- − Requires committed participation.
- − Time consuming – requires several days for preparation and several days for workshops.

References

Holman, P., and Devane, T. eds. 1999.The change handbook: group methods for shaping the future. Berrett-Koehler Publishers Inc., San Francisco.

Evans, Kristen et al. 2006. Kristen Evans, Wil de Jong, Peter Cronkleton, Douglas Sheil, Tim Lynam, Trikurnianti Kusumanto, Carol J. Pierce Colfer: Guide to participatory tools for forest communities/by. Bogor, Indonesia: Center for International Forestry Research (CIFOR), 2006. ISBN 979-24-4656-7 37p.

More information about Visioning and Pathways

Evans, K., Velarde, S.J., Prieto, R.P., Rao, S.N., Sertzen, S., Davila, K., Cronkleton, P. and de Jong, W. 2006. Field guide to the future: Four ways for communities to think ahead. CIFOR, ASB, ICRAF, Nairobi.

Nemarundwe, N., de Jong, W., Cronkleton, P. 2003. Future scenarios as an instrument for forest management: manual for training facilitators of future scenarios. CIFOR, Bogor, Indonesia.

Wollenberg, E., Edmunds, D., Buck, L. 2000. Anticipating change: scenarios as a tool for adaptive forest management: a guide. CIFOR, Bogor, Indonesia.

Voting methods

Voting methods serve to organise decisions a group has to make between two or more alternatives if no consensus can be achieved otherwise.

Scope of application

Voting clearly belongs into the domain of problem solving but can be applied at every point in time in order to obtain a true image of stakeholders' opinions.

Generic method description

A voting method contains rules for the casting and validity of votes and how to tally and aggregate them to yield a final result. However, most voting methods have been developed in the political realm for the purpose of electing *candidates*. In a collaborative planning situation, their use is subject to different conditions:

- Voting in collaborative planning will mostly be used to select one, or establish preferences, among several **proposals or alternatives**, not persons. This bears on the methods applicable. For instance, candidates can negotiate and enter coalitions if no single candidate is supported by a majority. This is not possible with proposals contradicting each other. People can negotiate; proposals can *be negotiated*, but usually not to the same extent without losing their meaning.
- Elections in governance aim at establishing a result in one shot, without checking or discussing the outcome. In a collaborative planning group, voting is more likely to be used to **capture moods** halfway through a discussion which may require application of different methods. The methods themselves bear on the outcome, and some are more suited to making final decisions while others are more apt to mirroring attitudes.

The following selection of methods refers to **voting on proposals**, not candidates. There are a lot of more complicated methods available, partially involving complicated measures of recasting secondary votes. This is not considered necessary here because run-off votings can easily be organised within a collaborative group.

SINGLE-WINNER AND PREFERENTIAL VOTING

Single-winner voting, also called 'first-past-the-post' (in analogy to horse races), refers to methods that establish one out of several proposals or candidates as winner, without considering the others. They are suited where a decision between several, possibly irreconcilable, proposals must be made. **Preferential voting**, in turn, establishes an order of preferences, or a ranking. Except for majority voting, most methods are suited for both purposes, with some individual advantages and

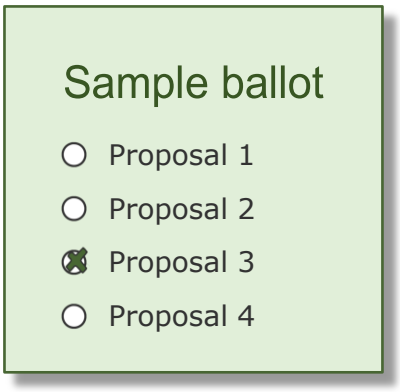
disadvantages, depending on the purpose.

Benefits/Drawbacks (all methods)

- \+ Voting is familiar to everyone and widely accepted as a democratic means of settling disputes.
- − Most voting methods use more of a participatory than collaborative approach, applying majority rules.
- − Voting methods can differ considerably in their results, given the same constellation of proposals and participants. Selecting a particular voting method can amount to biasing the outcome.

Plurality voting

In plurality voting, each participant can vote for one out of several proposals or candidates. The proposal receiving the largest proportion of all votes will be the winner, even if it is not supported by the majority of voters. The method is especially suited to **exploring participants' opinions**. It gives a good chance also to 'off-the-beaten-track' proposals and can be considered **innovative** in that light. It is less suited to establish stable solutions with long-term support from all participants.



- \+ The system is supposed to **mirror the sincere opinions** of all participants. It does not promote 'tactical voting' but gives equal chances to all proposals.
- − The winner is **not necessarily supported** by the majority of all participants. It is therefore rarely used in political elections.

As a preferential voting method, the system is called 'plurality-at-large voting' and can be used to establish an order of preferences, with the same advantages and disadvantages.

Majority voting

Majority voting is similar to plurality voting, except that a proposal in order to win must receive more than 50% of all votes cast. If none of the proposals reach this quota, a second (run-off) ballot will decide between the two most successful candidates.

Although it seems unfair at first sight to exclude proposals that don't have a chance of more than 50% support, majority voting is closer to the collaborative idea than plurality voting because it promotes compromise by 'tactical voting', if only in the second ballot: If you see that your favourite proposal is far behind, you will vote for your second-choice. This is expected to lead to a **well-balanced solution** many participants can accept. It will, however, give little chance to proposals off the mainstream. In this sense, the method can be considered **conservative**.

- ✚ The winner will have the **support of the majority** of voters.
- ━ The system encourages a tactical voting behaviour of focusing on the most promising options that gives **little chance to minority proposals** to even be considered.

Approval voting

In approval voting, each participant may vote for (approve of) as many of the proposals as they wish by checking them on a ballot, without expressing a preference. The winner is the candidate receiving the most votes. Each voter may vote for any combination of candidates but can give each candidate at most one vote.

Approval voting does not force participants to decide in favour of a single solution but allows for more diversified opinions. Like plurality voting, the method is likely to give a **true account of voters' sincere opinions**. On the other hand, it is **unsuited to settle decisions between conflicting proposals** if more candidates are involved.

For instance, let us assume that 45% of the voters (**group A**) are in favour of proposal 1 and dislike proposal 2 very strongly. The other 55% (**group B**) are in favour of proposal 2 and dislike proposal 1 very strongly. If all voters cling to the idea of tactical voting, group A will tick proposals **1, 3 and 4**, assuming that everything is better than proposal 2. Group B, in its turn, will tick **2, 3 and 4** for the same reason. As a result, proposal 4 will be the winner, although nobody really was in favour of it.

- ✚ The winner is likely to be **accepted by many voters**.
- ━ The winner is **not necessarily the favourite** of many voters.
- ━ The system encourages a necessary-evil voting strategy that may render **distorted results in a neck-and-neck contest** between two conflicting proposals.

Borda count

With the Borda count method, voters assign points to every proposal on their ballots, thus establishing a ranking: If there are *n* proposals on the list, a voter's first choice (most preferred proposal) will receive *n-1* points,[1] the second choice *n-2* points and so on until the least favoured proposal which will receive 0 points. The winner is the candidate getting the most votes altogether.

Sample ballot

2 Proposal 1
0 Proposal 2
1 Proposal 3
3 Proposal 4

Like approval voting but more precisely so, the Borda count method is supposed to reproduce the sincere **opinions of voters in much detail**. Additionally, due to the fact that every voter must give a full range of ratings from *n-1* down to 0, the method places proportionally more **weight on the lower ranks** than any other one mentioned here. It tends to favour **proposals supported by a broad consensus** among voters, rather than those favoured by a majority. On the other hand, under the Borda count system it is possible for a proposal that is the first preference of an absolute majority of voters to fail to be elected.

- \+ The system tends to render 'soft' outcomes that come **close to a consensus**.
- \+ The winner is likely to be **supported by most voters**.
- − The winner is **not necessarily the favourite** of a majority. The majority's favourite may fail to be elected.

References

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Pykäläinen, J., Hiltunen, V. & Leskinen, P. (2007): Complementary use of voting methods and interactive utility analysis in participatory strategic forest planning: experiences gained from western Finland. Can. J. For. Res. 37(5): 853–865.

[1] Some sources give the highest score as *n*, not *n-1*. It is, of course, irrelevant to the ranking what the highest score is, but a ranking from *n* down to 1 has the disadvantage that you cannot tell from the ballot whether 1 is the highest or lowest ranking; with *n-1* down to 0, you can because you don't usually give 0 as a symbol for your first choice.

World Café

World Café is a group interaction method that focuses on conversations. The idea is to create a hospitable and safe atmosphere so that people feel comfortable to think, speak and listen and let their creativity flow. With World Café it is possible to deal with several issues/questions, i.e. conversation topics, simultaneously. World Café has no definitive format and can be modified to meet a wide variety of needs. It is suitable for small or large groups of participants: the number of 'café tables' may vary but the number of people in groups holding conversations should not be less than 4 or exceed 6.

Scope of application

A method for organising group discussions of complex issues among laypeople.

Method description

World Café method was first tried experimentally in 1995 by Juanita Brown and David Isaacs (Brown, 2002). The word 'café' refers to the informal seating at several small tables to encourage conversation and 'world' symbolises how the format allows participation of dozens, even hundreds of people at a time. It can be very suitable for a collaborative planning process since the core idea is to create surroundings that are safe and inviting for people to engage in an authentic dialogue and freely let their ideas flourish. There can be many participants in the whole event but they have to be divided into small groups of 4-6. The groups take turns in different tables and hold a series of conversational rounds lasting from 20 to 45 minutes. Somebody of each group will act as the host and lead the conversations. Alternatively, hosts can be assigned for each table to stay in place and explain the next group the ideas of the previous one.

The World Café format is flexible and adapts to many different circumstances, based on a few simple components. When the following five components are used together, the World Café experience is more likely to be optimal.

1. **Creating hospitable space**. Make the space look like an actual Café, arrange tables and chairs and maybe offer some refreshments. Put a couple of large white sheets of paper over the tablecloth and include pens and markers on each table to encourage scribbling, drawing, and connecting ideas. It is important that people can see each other's ideas.
2. **Exploring questions that matter.** Each table has its own topic of conversation, usually in a form of a question. Conversations should center around something that the participants care about. Well-crafted questions create energy and direct attention to what really counts.

3. **Encouraging everyone to contribute.** It is important to encourage everyone to contribute their ideas and perspectives, while allowing anyone who wants to contribute through their silent listening to do so. If wanted, a talking object, e.g. a stone or a ball, can be used to support the dialogue. The person holding the talking object talks while the others listen; no interruptions are allowed.
4. **Connecting diverse people and ideas.** When participants move to different tables they carry with them the core ideas, insights or deeper questions of their initial group. The key ideas of the previous group (written down for everyone to see) are explored before the next conversation starts. Usually ideas start to connect up to other ideas and sharing of knowledge occurs.
5. **Making collective knowledge visible.** At the end of the conversation rounds, the main ideas are summarised and follow-up possibilities discussed. If the ideas are not analysed immediately, there is a risk of losing some of the emerging themes and imaginative solutions. It is possible for a skilled facilitator to draw the group's ideas on a large wall mural as part of the whole group conversation. This allows everyone to see the relationships among key perspectives as well as the larger picture they are creating together. Alternatively, the sheets of paper where the ideas were originally written or drawn can be placed on the wall. Table hosts or other individuals are invited to share insights or other results from their conversations with the rest of the large group.

Benefits/Drawbacks

- \+ Ideal for sharing knowledge, stimulating innovative thinking, and exploring action possibilities around real life issues.
- \+ Format is quite flexible and settings can be modified, as long as inviting and safe café atmosphere is maintained.
- − Requires more time than an hour. Essential parts, such as the summarising conversation, should not be dismissed.
- − Not suitable for events with less than 12 participants.

References

Brown, J. (2002): The World Café. A Resource Guide for Hosting Conversations That Matter. Mill Valley, Whole Systems Associates.

More information about World Café

The World Café & The World Café Community Foundation website

A short video on YouTube