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Cost-benefit analysis in interactive planning processes

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Introduction: the whys and wherefores of this article

A plea for an integrated approach

Pressure on space is increasing incessantly. Especially in areas such as metropolitan deltas, which are both physically vulnerable and attractive for development, the demand for space exceeds supply. The need for multiple use of space is therefore growing. This requires interactive planning.

Much has been written about how to hold landscape dialogues with stakeholders in the region concerned. However, mostly the costs and benefits of the development plans to society are only computed in the final stage of the planning process. The Agricultural Economic Research Institute (LEI) argues in this article for integration of a cost-benefit analysis (SCBA) in interactive (regional) planning processes. The emphasis is on areas where multiple use of space is seen as a prerequisite for development of the region.

LEI vision and experiences

According to LEI, SCBA should be an essential part of the planning process. Firstly, it avoids time and money being spent on elaborating a plan, which is not beneficial to society. Secondly, it helps to prevent unwarranted enthusiasm for inauspicious plans among participants in the landscape dialogues. This will frustrate public support for the rest of the process and for similar processes in future. LEI already has some experience in integrating SCBA in regional-planning processes. Moreover, the institute increasingly applies interactive methods in its research. These now are the ingredients in the processes we propose in this article; combining SCBA and interactive planning.

Structure of the article

This article consists of four parts. The first part discusses the growing demand for space, the concept of multiple use of space and changes in planning approaches. The second part focuses on the theory and practice of interactive planning and brings to notice the knowledge and experience of LEI in this field. The third part considers the whys and wherefores of methods to assess the feasibility of plans. Available instruments and models are discussed in terms of their usefulness to regional development. Next, we report on the first steps of applying SCBA in regional planning processes. This is based on the experiences of LEI in two regional projects. These case studies illustrate the proposed integration between interactive planning and SCBA. The fourth en last part of our plea introduces the 'ideal' type of integration. Recommendations are put forward on how best to apply this integrated approach. The article ends with concluding remarks and reflections on further research.

Background

The growing demand for space

Let us illustrate the growing demand for space in view of the situation in the Netherlands. In a sense the Netherlands form a single metropolitan delta. It is also one of the most densely populated countries in the world. We illustrate the phenomenon of the growing demand for space with some Dutch data (CBS, 2003). The first half of the 20th century was characterised by a rapid population growth. In 1900 the country counted about five million inhabitants. Only 50 years later this number was doubled. In the year 2003 more than 16 million people live on the 34,000 square kilometres land of the Netherlands; this means some 480 per square kilometre, far more than the 150 of a hundred years ago (CBS, 2000). This increase becomes even more impressive if one realises that the land area itself has grown by 6 % since 1900, due to land reclamation. If this had not been the case nowadays there would have lived over 500 people per square km. Furthermore, the expectation is that the population will number 17 million in 2030.

Multiple use of space as a solution

All these people want to live, work and recreate. At the same time, people demand more space for themselves (a big home with a garden) than in the past. Moreover, it is not only the growing quantitative demand for space that needs attention. More and more, the qualitative aspects of space become important. For example, people attach a growing value to a living environment that is diverse and ecologically sustainable. This changing demand is closely connected to the increased prosperity in the past decades, which has also led to more time for leisure activities. In this light there is also a growing demand for space for outdoor and nature-related activities, which affects the value of the functions of space and therewith land-use patterns.

It is clear that due to this growing and increasingly diverse demand for space, the allocation of space becomes more complex. Multiple use of space is therefore a concept that must be taken seriously in regional planning processes. Policymakers embrace this concept also, because multiple use increases spatial quality (Van Vliet, 2000). An important aspect of multiple use of space is the number of dimensions that is studied. The traditional approach is two-dimensional: projected onto the base area. In our approach, the combination of functions is the issue. This approach is not new, of course, but became popular again in recent decades. Nowadays, multiple use of space not only concerns the combination of functions. It is seen as a collective term with the aim to achieve spatial quality. Habiforum (the Dutch knowledge network for multiple use of space) employs the following dimensions of multiple use of space (Van Vliet, 2000): a) an intensified use of space, for example clustering of facilities; b) combination of functions; c) utilising the third dimension (for example building underground); d) dimension of time (the fourth dimension): functions change on the basis of day and night, day of the week and by seasons.

Interactive instead of a hierarchical planning

The concept of multiple use of space requires a more interactive and regional type of planning than traditional spatial planning with its strongly top-down approach. This doesn't imply, however, that the *process* needs no leading actor. One actor (preferably at regional level) should be responsible for the process. This role has to be accepted by the other actors, who focus on the content of the planning process. After all, which form of multiple use of space is most suitable depends on the characteristics of the functions that are combined, the specific regional situation and the demands and desires of local actors (stakeholders and shareholders).

In the case of multiple use of space, more people and organisations are involved in the process. Furthermore, the difficulties in the planning and application of projects where multiple use of space is under discussion, become overt on a regional scale. This was in 1998 one of the conclusions of the first part of the research programme of Wageningen University and Research Centre (WUR) called 'New concepts for integral use of space'. Another conclusion was that case studies are a necessary and fertile instrument to get a better control of the problems of integral use of space. Case studies are necessary because every situation is unique. A general instrument for integral or (in other words) multiple use of space is therefore out of the question. Interaction between actors, physical situation and various developments demand specifically regional solutions. However, to arrive at specific solutions, most of the time the same instruments and methods can be used.

The conclusions described above match with the recommendations of the Dutch Scientific Council for Government Policy (WRR), which recently gave the initial impetus for spatial planning to be better linked with social dynamics, for example the growing demand for space (WRR 1998). In their report, attention is focused on strengthening integral planning and the forming of social coalitions on a regional scale.

Interactive planning

More freedom for the decentralised government

Earlier we mentioned the need for a more interactive and regional type of planning in case of multiple use of space. A top-down planning method, which dominated spatial planning in the Netherlands especially in the decades after World War II, is no longer satisfactory. The advice of the Dutch Scientific Council for Government Policy (WRR, 1998) about 'strengthening integral planning and the forming of social coalitions on a regional scale' is included as an assumption in the most recent Dutch Note of Spatial Planning (VROM, 2001). The advice is expressed as follows: 'The decentralised govern-

ment will get more freedom to give shape to their own spatial development policy' (VROM, 2001, p. 260).

In the next section we answer the question from which methods we could learn to achieve a more interactive and regional type of planning. Thereafter, lessons are presented from pilot studies in which such planning is applied and in which multiple use of space is developed.

Theory about interactive planning

In the literature, several methods and models are described that can be used in organising an (interactive planning) process. In the following we focus on three methods that are helpful for the development of a planning process. These are the Soft Systems Methodology, the Knowledge Creating Process and the approach of the interactive process as a negotiating process.

The *Soft Systems Methodology* from *Checkland* consists of six phases. It uses the experience of a particular situation as problematic as its point of departure (Checkland, 1989). The actors must define this problem in detail (phase 2). When this is clear, in the third phase one can design several models, which represent a desired image. In the fourth phase, the models are compared and possibly adapted to the real situation. The formulation of desired states of affairs is the aim of the fifth phase. In the last phase one must take action to improve the situation.

Nonaka and Takeuchi see the conversion of knowledge as driving force of the *'Knowledge Creating Process'* (Nonaka & Takeuchi, 1995). The first phase in their method is called 'socialisation' and consists of sharing experiences. In the second phase ('externalisation'), the tacit knowledge from the first phase must turn to explicit knowledge by means of pictures or metaphors. After that, the explicit knowledge from the different sources is joined (system knowledge). In the fourth and last phase, the 'new' knowledge is made familiar: the explicit knowledge becomes tacit knowledge. Now the cycle can start again with the 'new' tacit knowledge as input in the socialisation phase.

Finally *Leeuwis* sees an interactive process as a negotiating process. His method is useful in conflict situations. He distinguishes seven tasks. First there are the selection of the participants, the investigation of the problems in relation to the context and the investigation of the relations. The aim of the second task is to come to an agreement about the organisation of the process. After that, participants must analyse the conflict situation together in task three. Task four is called 'joint-fact-finding': actions are formulated. Task five is to steer towards an agreement. This is followed by communication between the representatives and their constituencies. The seventh and last task consists of monitoring the agreements that are made about implementation.

It is, of course, also possible to combine methods. For example, the insights of Leeuwis about how to deal with a conflict in a process and the perceptions of Nonaka & Takeuchi about the role of knowledge can be integrated in the theory of Checkland. For instance, one can apply the fifth task of Leeuwis ('steer towards an agreement') in the sixth and last phase of Checkland ('taking action to improve the situation').

The theories described above are used in the development of techniques in processes where multiple use of space is called for. The next two sections focus on this development.

The concept of 'multiple use of space' in interactive planning processes

The experiences described here and in the next section, concern pilots of regional planning processes in which multiple use of space was an important issue. This is a logical restriction because the concept of multiple use of space makes special requirements of a planning process. This was made clear in the pilot project 'Multiple use of space in the south-western part of the Netherlands', which is part of the afore mentioned research programme of WUR called 'New concepts for integral use of space' (Projectteam Zee en Land, 2001).

It may not come as a surprise that projects where multiple use of space is an issue, are complex. In the pilot project therefore, three crucial aspects of a successful application of the concept of multiple use of space are mentioned (Projectteam Zee en Land, 2001). In the first place, 'knowledge innovation' is very important. Because of the integrated approach and the multiplicity of actors involved, a good organisation of the various types of knowledge is crucial. In the second place, public support and participation are essential. To arrive at successful and widely accepted plans, the integration of knowledge with the participation of regional actors, is necessary. The third crucial aspect is a modular approach in combination with evaluation. In case of complicated spatial topics, working with one comprehensive solution is not realistic. It is better to work with modules.

These aspects can be applied in the process through so-called Communities of Practice (CoP). Habiforum defines a CoP as an organisational and work form and most of all as a learning environment of interested actors. The aim is to arrive at innovative concepts of multiple use of space. The lessons that were learned from pilot project 'Multiple use of space in the south-western part of the Netherlands', described above are applied in a pilot project called 'Sea and Land in Multiple use'. The next section pays attention to this pilot.

Experiences with the application of the concept of multiple use of space

The pilot project 'Sea and Land in Multiple use' was carried out by the Dutch Department of Public Works, the National Planning Service, Alterra and LEI. In 2001, several workshops were held to examine the opportunities of multiple use of space in the process of improving the spatial quality of the south-western region of the Netherlands. The intention was to create a feasible basis for a regional CoP in which the desired projects could be stimulated and refined. In the pilot project the perceptions of Nonaka about the importance of knowledge creation were used: during the process, a process manager, and also a knowledge manager played an important role in the coordination of the planning process. Elements from the Soft Systems Methodology (Checkland) and Leeuwis' method can also be recognised.

The planning methods in the project were worked out on the basis of four case studies. These case studies linked to realistic policy options of different forms of multiple use of space. Five steps can be distinguished: 1) Fact finding by the project team. This step also included the defining of the problems encountered in the region; 2) A first workshop with participants from the relevant provinces, municipalities, regional Directorates of the Ministry of Transport, Public Works and Water Management, NGO's (for instance, Southern Agriculture and Horticulture Organisation, Environment Federation Zeeland) and national experts. The aim was to formulate desired states of affairs (this bears comparison to the theory of Checkland for example); 3) Elaboration of the desired states of affairs by the project-team. In this phase attention was also paid to planning the rest of the process; 4) A second workshop: the implementation phase with similar participants as in the first workshop. How feasible are the projects? For every case a final project was made. A final project is for example (an intention for) an agreement to establish a 'real' CoP (this bears comparison to the theory of Leeuwis for example); 5) The follow-up of the project, the transfer to the regional shareholders and stakeholders. In this phase it is discussed how the various projects could be put into action in the region.

As was mentioned earlier, the intention of the pilot project was to create a feasible basis for a regional CoP. During the project this is translated into a renewed and more aggressive approach for the development of a National Landscape in the south-western region that is announced in the most recent Dutch Report on Spatial Planning Policy (VROM, 2001). In the workshops (high tech) computer models were used to facilitate the interactive planning process. We had to conclude that the participants did not use these new techniques effectively. They seemed to be scared to add their information directly to the planning aided models. A facilitator had to do the actual input. Another result was that the participants' output of the workshop did not have

the right format to be used in land use models that estimate future land use. The input requirements of this software did not match with the 'language' of the participants.

Research on the feasibility of plans

Insight in consequences of spatial decisions

Space can be used in many ways. We distinguish production space on behalf of economic development, living space and the strategic stock of nature and landscape (Reinhard et al., 2003). These three elements are related to each other. Development in one element (for example industrial production) has inevitable consequences for the other elements (for example landscape). In policymaking the various forms of spatial utilization must be considered carefully. Therefore, it is necessary to gain insight into social and other consequences of certain decisions. In other words: the costs and benefits of the decisions must be clarified ex ante, through a process known as appraisal. The following section discusses several methods and models to support this process. Next, the experience of LEI in applying social cost-benefit analysis in regional planning processes is described. This will take place by means of two case studies. The methods and experiences presented are the beginning of a first attempt at integration between interactive planning and cost-benefit analysis. This attempt is described in the last section of this third part of the article. Which combination of methods seems the best? In the next and last part of this plea the exercise will be further developed.

Appraisal theory

This section briefly describes three methods of integral appraisal. We pay attention to the method of multi-criteria analysis, social cost-benefit analysis and finally, cost-effectiveness analysis. Social cost-benefit analysis values effects in monetary units, whereas the other two do not. Other appraisal methods are also frequently used. Most of them focus just on certain aspects. For example in the Netherlands an environmental impact assessment (EIA) is a requirement for projects that affect the environment. In the EIA the proposed project has to be compared to the alternative that least affects the environment.

Multi-criteria analysis (MCA) is a general method to approach problems of choice. The aim of MCA is to investigate a number of alternative choices in the light of multiple criteria and conflicting objectives. A ranking of the alternatives can be made on the basis of their suitability. MCA starts from different, explicit criteria of judgment. It is also possible to give one criterion more importance than another. There are three different approaches in MCA: cardinal methods (use of quantitative criteria scores), qualitative methods (use of qualitative scores) and mixed data methods (use of quantitative and qualitative scores). The basis of these methods is the same. The following steps can be distinguished: 1) determine the set of alternatives; 2) formulate the criteria on which the alternatives are judged; 3) determine the scores of the alternatives on the criteria (these are called the criteria scores); 4) standardize the criteria scores (value between zero and one); 5) determine the importance of the criteria (assign weights); 6) link the criteria scores to the weights; 7) from a large amount of scores, formulate an overall mark. As with all models, MCA has some disadvantages: there is as risk that certain aspects are expressed by multiple criteria, while other aspects are not specified, thus introducing hidden weights. Moreover, the importance of the criteria can vary from one person to another and it can change in time.

Social cost-benefit analysis is based on welfare economics (in contrast to MCA). It estimates the project's contribution to welfare. In any SCBA, several stages must be considered. The social benefits of a project consist of the extra benefits the project yields with regard to the original situation. 'Benefit' is a concept from economic theory and can be described as 'that which indi-

viduals experience during the use of goods and services and what they try to maximize' (Eijgenraam et al., 2000). The essential steps are: defining the project, identifying impacts which are economically relevant, quantifying physical impacts, calculating a monetary valuation, discounting, weighting and sensitivity analysis. Focusing on society as a whole makes is possible to select a project on the basis of his contribution to social goals. A second difference with MCA is that it is expressed in terms of money. This enables weighing of the different effects. These two points are the most important arguments for choosing to integrate SCBA (and not another integral method like MCA) in planning processes on a regional scale. MCA has the advantage that policy makers can more easily understand it, because this method can be explained quickly. A SCBA is more expensive than a MCA. The distribution of the costs and benefits over the population is not incorporated in a SCBA, while income distribution might be a policy objective. For a comparison of MCA and SCBA the reader is referred to Reinhard et al. (2003). For infrastructure projects the so-called OEEI (Research on the Economic Effects of Infrastructure Projects) guidelines have been developed. Since April 2000 the Netherlands government declared these guidelines compulsory for projects with a spatial dimension of national importance.

In *cost effectiveness analysis* (CEA) different projects (measures) are compared that generate the same outcome. Because the result of the projects that are being compared is identical the project with least costs for society is preferred. These social costs are computed according the social cost benefit analysis. The main difference with SCBA is the fact that benefits are not expressed in monetary values.

In the first part of the article we mentioned the growing demand for nature and recreation facilities as a result of increased prosperity. In combination with the circumstances of multiple use of space, this requires certain conditions of SCBA. The benefits of land uses as recreation and nature for example, must be incorporated in the social cost-benefit analysis. The services provided by recreation facilities, landscape and nature are not traded in a market: they are external effects and therefore the valuation of these land uses is more complicated. In case of multiple use of space the costs can be computed easily but the benefits is mostly not a simple summation of the benefits of the underlying functions. In the SCBA these problems have to be solved. In the case of nature development, for example, it deals with an increase of enjoyment in living and recreation and income from the timber sale. Some goods can be traded in the market, and can therefore easily be assigned a price. However, if this is not the case (like nature and clean air), the benefits must be estimated by means of valuation methods. Often external effects are treated as p.m. (pro memory) in the costs benefit balance.

A first attempt at integration

Apart from the concept of multiple use of space in planning processes (which was described in the second part of the article), LEI also has experience with processes where SCBA is integrated in the planning process in one way or another. We focus on two case studies to illustrate possible ways of applying SCBA in interactive planning processes. In the first case study, we focus on the definition of desired images in Checkland's sense. This was necessary because the development situation was blocked and a final common view was far from being reached. In the second case study, there was a completely different situation. A large number (10) development scenarios were given, but the difference between them in terms of social welfare was unknown.

The case of *reopening the Apeldoorn Canal* illustrates the interactive use of SCBA in designing alternative development models. The Apeldoorn Canal is an early 19th century waterway in the centre of the Netherlands that once opened up the eastern rim of the Veluwe region for economic development. Due to several reasons, the connection fell into disuse and finally in 1972 the canal was closed completely for navigation. In recent years however, local au-

thorities, leisure investors, nature conservators, water companies and protectors of industrial heritage became aware of the high potential value of the Apeldoorn Canal, albeit from different perspectives. Many studies, surveys, models and development plans were published. The central issue was reopening the canal for navigation, in particular for recreation vessels. It was evident that interests diverged and a simple solution was not easy to be found. Only a balanced combination of functions attributed to the canal and its immediate surroundings could possibly lead to a sustainable solution with increased social welfare. In this case SCBA was applied in an interactive process to facilitate the discussion about an optimal mix of functions.

The process consisted of seven steps. In the first step the researchers defined two preliminary alternative models, based on elements mentioned in the available studies of the Apeldoorn canal. In the second step, the most dominant effects of both models were identified and those effects that could be assessed in monetary terms were calculated. In other words: in this stage a first and quick SCBA based on rough data was done. These results were given feedback to the advisory group of the study. The discussions in the advisory group then gave rise to amendments on both models. In the third step, we reformulated the two models by changing the amount of several elements or by adding or deleting certain elements completely. With this input, we recalculated the effects in order to have a more realistic SCBA than in the second step. The fourth step of the interactive process consisted of a creative session in the form of a workshop with a group of about 20 specialists in the functions concerned, like recreation businessmen, forest managers, waterboard managers, consultants for tourism, Chamber of Commerce, etc. The participants were invited as private persons, not as representatives of an organisation. The objective of this workshop was to see if new elements could be added to increase the social cost-benefit balance of the respective models. Besides, we expected to find out whether elements from both models could be combined in order to construct a new, third model. Among other things, the output of the second SCBA was used as input. The result of the session was that a surprisingly large common basis of both extreme models could be defined.

Following the workshop, we again performed an SCBA starting from the once again reformulated models. Although this was intended to be the fifth and last step of the project, the interactive process did not stop. Even the draft report of the study containing the results of this SCBA stimulated the parties involved to reconsider the functions and in particular the volume of some of the elements. One lesson from this study is the need for frequent feedback between researchers, clients and other participants. Another conclusion is, that the position of SCBA as a facilitator of the process must be clear beforehand to all parties involved. None of the regional authorities was the direct commissioner for the project, which was presented and carried out as a methodological (but not theoretical!) study. This fact greatly enhanced the involvement of the participants in the workshop.

The case of the *inundation of the Horstermeer Polder* is an illustration of the use of SCBA identifying an optimal development model and facilitating the process of finding new alternatives of spatial design. The Horstermeer is a polder in the vicinity of Amsterdam. Due to its low position in comparison to the neighbouring hills, groundwater flows into the polder. This water has to be pumped away permanently in order to have the place habitable and to make it possible to practise agricultural activity. Almost 50 % of the area is used for keeping dairy cattle.

The regional authority, the Province of North-Holland, wishes to enlarge the nature area in its territory. This could be done by inundating about 40 % of the Horstermeer polder and converting it into wetlands, at the same time relieving the water problem. Inundation of such a large area was considered a major intervention in the natural environment, for which an environmental impact assessment (EIA) had to be performed. The scope of EIA is primarily environmental and not aimed at optimising the social cost-benefit balance. It was therefore decided that in addition to the EIA, an SCBA would be per-

formed. Originally, the various alternatives distinguished in the EIA were taken as input for the SCBA. Seven alternatives were taken into account, along with the so-called autonomous development scenario. For each alternative, an SCBA was carried out. The results of this process were reported to the client of the study. Until this moment, there was no interactive process. But since the project has not finished yet, this may yet come about. One main conclusion so far is, that SCBA itself is a useful method to find the optimal model, but the differences between the models are too small for SCBA to have an added value as compared to simple financial cost-benefit analysis.

At the same time, however, the inhabitants of the Horstermeer realised, that partial inundation of their polder might be a sub-optimal solution. Supported by the government-sponsored Habiforum Knowledge Network for Multiple land use, the inhabitants of Horstermeer developed two far-reaching models. In these models, known as the "mirror project", the polder was completely redesigned. In sessions with the inhabitants and the client for the EIA study, the researchers identified the essential elements of these models, both in quality and quantity. Local representatives could provide some key indicators. With this input, an SCBA for the mirror project models was performed, in which a clear contrast between the models appeared.

The lesson learned from this application of SCBA is that the discussion between researchers, clients and other participants should focus on two or three clearly distinctive models. Too much detail should be avoided. On the other hand, key indicators used in calculating effects have to be available and well documented.

From both cases, it becomes clear, that information about the social effects of spatial development plans should come from two sources. On the one hand, the regional stakeholders, who have their visions and opinions about the development as a whole as well as detailed information about one or two specific functions. On the other hand, there are the researchers who must have at their disposal methods to manage the process and general data and key indicators. With respect to this latter fact, both parties are aware of the concept of multiple land use, but adequate data are scarce. For example, in the Apeldoorn Canal case the aspect of combining drinking water and navigable water are examples of the second and fourth dimension of multiple land use as distinguished by Habiforum (Van Vliet, 2000). In the case study very different data sources had to be combined and a balancing could only be made indirectly.

In general, this poses the problem of reliable data for combinations of functions, be it in space, time or otherwise. Almost all monitoring systems are still concerned with unique, non-interacting functions, e.g. added value for agricultural activities or even valuation of nature areas. The fact, that one plus one might be larger than two yet cannot be derived from basic data.

Towards an ideal type of integration

Soft System Methodology as leitmotiv

For the ideal integration of interactive planning and SCBA the stages of both processes must be intertwined. Interactive planning focuses on the participants, their problems and communication. These elements do not exist in SCBA; because it computes welfare for society as a whole (all stakeholders), it assumes that the problem is identified (and shared) and that the project with the largest contribution to welfare is preferred. Public support and distribution of the benefits over the community are not part of SCBA, but are prerequisites for an interactive planning process.

Now what method of interactive planning seems best for the integration with SCBA? In the first part of our plea, we described the theories of Checkland, Nonaka and Takeuchi and Leeuwis. In our opinion, the theory of Checkland is the most suitable basis for integration with SCBA. This is because we embrace the idea that actors discuss the desired states of affairs among

themselves in several stages of the planning process. This approach is also successfully applied in the pilot project 'Sea and Land in Multiple use' which was quoted earlier in this article. The Soft System Methodology is therefore used as leitmotiv for the 'ideal model' of interactive (regional) planning processes, which is presented below (see also figure 1). As mentioned before, Leeuwis' insights about how to deal with conflict in a process and the Nonaka & Takeuchi perceptions about the role of knowledge are also useful in this respect.

From problem definition to a first project balance

The problem definition is the crucial first step that in the process; it must be defined by the regional actors (phase 2 in the Soft Systems Methodology). If the stakeholders and shareholders are not familiar with the current situation, joint fact finding is necessary to create a shared starting point for the planning process. These joined facts can be used to define the default situation, to compare the effects of projects. Thereafter several models are designed which represent a desired image. But one important aspect of the desired situation is, of course, the benefits gained by the transition to this new situation. However, these benefits are not clear from the beginning. The costs and benefits tied to a certain land use (for instance arable land) can be added to the designed plans. If the planning process is aided by a Sketch GIS application (Van Deursen) the costs and benefits of every form of land use can be easily attached to the desired situation as drawn in the plan. The goal is to start a discussion with the stakeholders about the direction in which to look for a solution of the problems encountered in the region. The summation of these costs and benefits provides a first impression of the financial and social feasibility of the plan. This information on the costs and benefits of a project is important if the budget for solving the problem is limited or when the project with the surplus benefits is selected. To calculate this first project balance a database of average costs and benefits of all relevant land uses must be available, for instance based on previous studies.

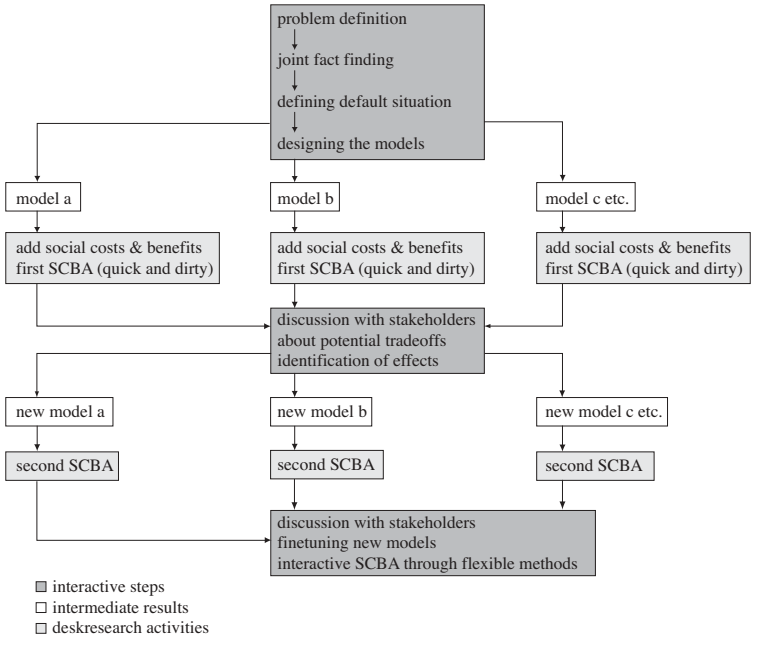

Figure 1: A planning process with the integrated approach

Using SCBA results in the discussion

The results of this first project balance can already lead to changes in the desired situation. This first cost-benefit analysis is a 'quick-and-dirty' method because interaction between the different land uses is not taken into account. Thus the exact location of a specific land use does not matter for the project balance. The results can be used to start a discussion among the various actors about the potential tradeoffs in the plan - for instance, building houses versus creating nature reserves. The role of this first cost-benefit analysis in the planning process is to create consensus about the direction of the

plan. Therefore it is essential to identify the effects of the plan in a group session. Although a long list of potential welfare effects exists in literature, it is necessary to analyse with the group of stakeholders and shareholders what effects are important in their context. This identification of relevant effects (relevant to the goals of the actors) is essential because it makes the impact of the plan clear to all and it facilitates the group process. The different goals of the actors are related to the impact of the plan, new coalitions may emerge. This session based on the first SCBA results also improves the acceptability of the final SCBA.

Refining the plan

In the next phase the plan is being refined. The land uses are located more exactly on the map. Again the costs and benefits are computed but now the relation between land uses is taken into account. For instance a recreational facility adjacent to a city generates more benefits than one located at a larger distance from that city. Houses located on a lakeshore are more valuable than houses without any water in the vicinity. At this stage also multiple land use is defined as a solution to fulfil as many demands as possible in the plan. The benefits of multiple land use are quite difficult to determine. Due to the interaction between multiple land uses at the same location, aggregate benefits are not simply the sum of the separate benefits. Often information about the magnitude of this interaction is not available. To minimise this negative interaction actors can make arrangements based on the local situation. An interactive process of planning the locations and computing the project balances will generate a plan with a higher project balance. In this phase two or more alternatives are defined. It is important that the argumentation of these plans is described well.

The exact project balance of these alternatives will be computed afterwards, based on more exact information on the region. If the exact balance differs significantly from the results of the second phase the researcher can advise changing the plan slightly to improve the project balance while still following the argumentation of the actors.

Advantages and circumstances of the approach

One of the advantages of this approach is that the actors get acquainted with the simple version of the cost-benefit method. This improves the support for SCBA of the final project. This approach also provides information for discussing the essence of the plan in the first phase before the plans are elaborated in detail. It also provides the stakeholders and shareholders with information about the feasibility of the plan at an early stage. Another advantage is that SCBA focuses on the benefits to society as a whole and not to specific groups. The distribution of costs and benefits could also be provided in addition to the standard SCBA to improve the acceptability of the approach and results for specific groups.

Concluding remarks

Combining SCBA and Soft System Methodology

We note the growing demand for space and need for more spatial quality. In areas where the demand for space exceeds supply (for instance in metropolitan delta areas), multiple use of space is seen as a solution for potential problems. We state that the concept of multiple use of space requires an interactive and more regional type of planning. The theories of Checkland, Nonaka & Takeuchi and Leeuwis can be used as input for interactive planning processes. If multiple use of space is at stake in these processes, three aspects must not be forgotten: knowledge innovation, a modular approach and public support. To create this support and to avoid time and money being spent on elaborating plans that are not beneficial to society, it is important that the costs and benefits of plans are clear early in the planning process. We postu-

late that social cost-benefit analysis is the most suitable method to achieve this.

We present an 'ideal' method for interactive regional planning processes (figure 1). This method is based on a combination of theories (Soft System Methodology) and experiences of interactive planning processes with appraisal theory (social cost-benefit analysis).

Points of special interest

The essence of our method is the fact that SCBA is performed at various stages of the process, based on the input of interactive sessions. The problem must be clear and the actors have to support the planning process to solve the shared problem. This approach allows improvement of the plans towards the desired developments. Fine-tuning of the plans in a final stage can also be based on an interactive session in which SCBA is calculated instantaneously. This step requires a very flexible SCBA model, which is prepared for the region. An important requirement is that all stakeholders and shareholders have to participate from the beginning. A situation where some actors stand aside and only become active when their own interest is threatened (the nimby effect) should be avoided. This also poses certain requirements for the interactive process; it should be quite simple to allow all actors to understand and to participate actively. A first quick-and-dirty SCBA shows the playing field, but for the remainder of the process a pre-arranged solution is not allowed. Although most aspects and stages of our method have been tested, new experiences might demand adjustments to our method.

Reflections on the future

An import issue for future research is how to get output of interactive sessions suitable for use in CBA models. Otherwise, it is also possible that adaptations to the standard CBA method (or a combination with another method like MCA) must be developed to reach the desired integration. Possibly the concept of articulating goals into a 'SMART'-schedule can facilitate combining appraisal and interactive policymaking. An accepted set of indicators for the costs and benefits of various land uses is necessary. Combining GIS facilities and SCBA models and a module to divide costs and benefits over the relevant actor groups will be a valuable extension of the SCBA instrument for interactive planning.

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