

Adaptive Implementation of Integrated Spatial Plans: A Game.

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Abstract:

“Spatial Development Veilen; A Simulation Game” (*NL: Gebiedsontwikkeling Veilen: Een Simulatiespel*) is a comparative experiment and a simulation game to educate students about the complexity of rural spatial planning. Two normative models of implementation strategies were compared: a serial strategic approach and a parallel adaptive approach based on Interactive Implementation.

The game comprises four main roles: the province, the municipality, the water authority and the agricultural population. The task of the governmental organizations is to design and implement an integrated spatial plan that complies to all policy goals of the different governmental actors involved. In interaction with each other and the local community they try to realize their goals. The game has an experimental set up. The teams face several surprises to simulate the complexity of reality.

The games are analyzed on process and outcome. In the analysis of the two implementation approaches we see that the teams using the strategic approach come to more innovative outcomes, but the parallel adaptive approach showed more innovations in the process. Observing the process and outcome it is noticed that the serial strategic approach faced much more obstruction and conflict in their interactions with the local population. The parallel adaptive approaches was characterised by cooperation and negotiation. Both approaches showed characteristics of cooperation and creativity, negotiation and bargaining, and conflict and obstruction. The outcome of the serial strategic approach showed more function combinations, but is realized for higher costs and more struggle. Because of the latter, it is concluded that the experiment shows that the adaptive approach fits better to the complex reality and implementing complex integrated spatial policy.

The paper ends with some notes on the game as a learning tool.

Keywords: *Adaptive water management; simulation game; strategic serial implementation strategy; adaptive parallel implementation strategy; Interactive Implementation; student experiment; rural spatial planning*

‘I hear and I forget, I see and I remember, I do and I understand’
(Confucius, Chinese Philosopher, 551-479 BCE)

1. INTRODUCTION

This paper presents the comparative case study Veilen. Veilen is a fictive village in the countryside of the Netherlands. The case is used in a quasi-experimental set-up in a simulation game. The objective of the experiment is to compare two strategies of policy implementation: the traditional serial strategic implementation approach and the parallel adaptive implementation

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approach, based on the concept of Interactive Implementation (Geldof, 2001). The case Veilen is based on research of actual cases in the Netherlands.

Research on adaptive management is often done by case studies. Case studies have the advantage of gaining in depth knowledge of a single case. The disadvantage of case studies, resulting from the small number of research objects, is the external validity. Especially since cases often cannot be selected freely to optimize generalization strength. Consequently: relying solely on case studies makes it more difficult to conclude something about the used strategy other than lessons being unique to this case. So as an addition, not a replacement, also a more experimental design – of course with its own limitations - might be worthwhile. This comparative experiment was carried out within the framework of a course of the Bachelor Public Administration of the University of Twente. The comparison of the two implementation approaches is focused on the main elements of the conceptual model: process and outcomes.

The paper first discusses the parallel adaptive implementation approach in comparison to the serial strategic approach. It continues with discussing the research methodology and explaining the quasi-experimental research design to compare the two approaches. In the following sections the paper will introduce the game and analyses the experiment. The paper ends with a discussion and conclusions on the experiment and some notes on the game as a learning tool.

2. TWO NORMATIVE MODELS FOR POLICY IMPLEMENTATION

In this section two approaches towards implementation of integrated water management projects will be introduced. The differences will be focussed upon, although it is admitted at beforehand that limitless in-between positions can be imagined and are observed in reality. In the end, they remain models. The differences have implications for the actors involved in the processes. In this paper the two normative models are referred to as the serial strategic approach and the parallel adaptive approach (see also Evers, forthcoming).

The traditional serial strategic approach starts by the idea that implementation is basically executing the plan. It implies an implementation chain of predictable activities in a setting in which dependence of the assumed relatively stable context is minor. In this context activities can be structured, chopped into phases and controlled. In the strategic approach the different phases are handled step by step (see Figure 1). Grip on the process is created by formulating a detailed plan. The plan is converted in a construction plan. The contractor makes changes in the physical water system. All outcomes that do not conform to this plan are perceived as failure. Next, the maintenance team tries to keep the project deliverable in balance. This approach represents current strategies of implementation in the Dutch water sector. The different aspects of water management are linked to each other in the planning phase. It results in an integrated water management plan. The greatest freedom and creativity of thinking is found in the front of the chain. It also creates *complicatedness*. Many processes collapse under their own beauty and well-thought-out plans disappear into the desk drawer (Geldof, 2001).

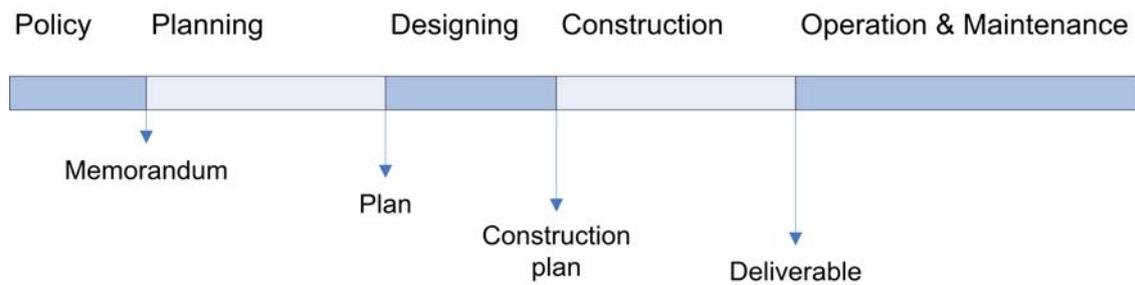


Figure 1: Serial strategic approach, the implementation process is characterised by consecutive process phases (Geldof, 2001)

The parallel adaptive approach is based on Geldof's (2001) concept of Interactive Implementation. It is thought to be more suitable for complex implementation tasks. Complex in this context assumes the absence of strings of serial activities. Instead the activities are considered to be recurrent and substantial uncertainties and dependencies are involved. The context of recurrent implementation activities is considered to be dynamic and unpredictable. The parallel adaptive approach suggests blurring the boundaries between the phases of the implementation chain (Geldof, 2001). This implies that the activities in the context of processes or steps are not serial to each other in the sense that the previous one has to be finalized before the next can start and can be shaped. This implies that the phases of the implementation process are not serial by definition, but exist, develop and interact along each other towards delivering the policy outcomes. As referred to above, they are considered to be recurrent.

This might easily lead to misunderstandings. Recurrent does not imply that random patterns can be expected. Logic ordering of activities and their interactions still exist, these are just hard to predict and record at beforehand. What is meant is that every step in implementation is now considered to consist of subsequent and often recurring rounds of decision-making (Teisman, Edelenbos, Klijn, & Verbart, 2001). By deviating from the idea of deterministic serial activities some benefits can be harvested. For instance decision-making with regard to design can benefit from first rounds of elaboration of a program for operation and maintenance. And lessons with regard to construction options might lead to change of design or even change of policy. Parallel adaptive implementation implies that every phase in the implementation chain benefits from advanced understanding in other phases. Maximizing the extent of parallel activities and linking advanced understanding to other phases is done by involved actors and requires craftsmanship and boundary spanning activities.

The evaluation criteria on success and failure differ from the serial perspective. Implementation is no longer defined as putting policy into effect. It now is defined as getting something done that makes sense. Then performance is the main objective and compromise a means of achieving it (Barrett & Fudge, 1981; in Hill & Hupe, 2002). The parallel adaptive approach (as shown in Figure 2) expresses implementation processes to be joint learning processes in which the actors are able to anticipate on the surprises and uncertainties the process will surely bring. Especially with regard to handling of complexity related uncertainties in the fields of engineering, hydrology, morphology or ecology or in dealing with the divergent preferences of actors involved, or both, this implementation strategy might be better equipped.

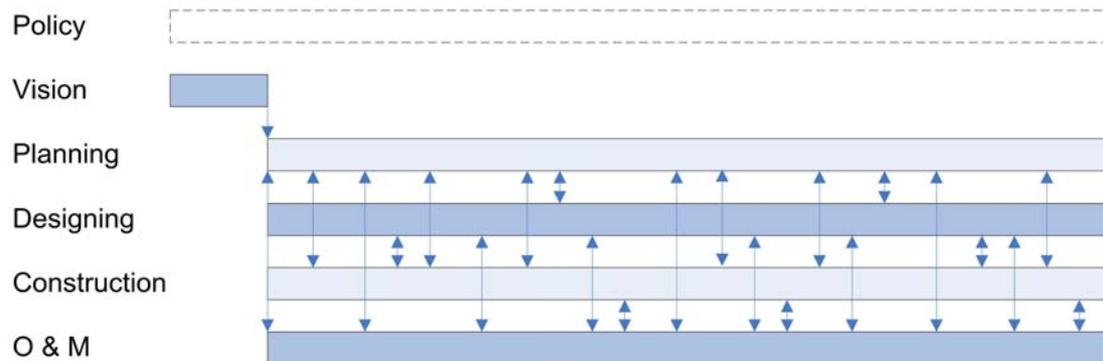


Figure 2: The parallel adaptive approach: Interactive Implementation. The activities are shown on the vertical axis, horizontal the time (Geldof, 2001).

In figure 2 the implementation process starts by creating a vision. It is necessary to first have the direction of the process clear. A vision is necessary to make people enthusiastic, it shows the direction, but leaves plenty of space for other stakeholders to bring in their own ideas. After the process of developing a vision the processes planning, designing, construction and operation and management evolve parallel to each other. A joint learning process leads to advanced understanding in each of the processes. In the serial strategic perspective these actors work independently from each other. Still we see in figure 2 a gap between the policy process and the phases of the implementation process. This is explicitly done because most of the policy is created at higher levels of government and the water authorities are mostly responsible for implementing these policies (like the European Water Framework Directive). It does, of course, not imply that there is no interaction between lower levels and higher levels of government when policies are created. In the end policies are formulated to improve field level situations and are based on field level observations.

Time and timing are two obvious components of policy implementation processes. Change takes time and timing is needed for change. The idea that change takes time is more related to the serial strategic approach as all the phases take time to induce change. The latter idea is strongly related to the parallel adaptive approach and can be compared with the multiple-streams framework of Kingdon (1984). Handling on time, when a "window of opportunity" opens, permits policy entrepreneurs to couple the various streams and induce change. In the concept of Interactive Implementation it is assumed that handling on time (timing) decreases the total time needed for the implementation process.

3. EXPERIMENT ON IMPLEMENTATION STRATEGIES

In this part I will discuss the used methodology for the comparative case study Veilen. First, some methodological background is shown on experiments, quasi-experiments and simulation games.

3.1 Methodology comparative experiment

The methodology that is used for this comparative study is quasi-experimentation (Cook and Campbell 1979). The quasi-experiment had the form of a simulation game. Validity criteria for the game are based on Peters *et al.* (1998) and Duke (1980). In this experiment the groups received or the serial strategic approach or the parallel adaptive approach as strategy for their implementation process. The outcome measures are: the process characteristics (interactive/non-interactive and cooperation, negotiation and conflict), the outcome characteristics (coalitions and function combinations and costs) and how the different groups dealt with surprises.

The simulation game started with three teams using the strategic approach (S1-3) and three the adaptive approach (A1-3), group sizes varied from 4 to 6 students. The teams played the game separate from each other and only heard during the final evaluation they played with different strategies. All participants were Bachelor students Public Administration of the University of Twente.

All teams started with the same problem situation. The game was played in three sessions of two hours. The participant played different roles with different tasks, the main characters were: the Province, the Municipality, the Water Authority and the agricultural population (divided in 22 characters with different levels of willingness to cooperate, scale 1-5).

The strategic teams worked in line with the strategic approach, delivering after every session a product (vision, plan, work deliverable). The products were handed over as an input for an other team in the next session. This simulates reality, as in reality people who create visions are other than people who create plans. Also the plans were shifted two another team, as people who plan are often different to the ones constructing the plan. The Adaptive teams worked in line with the adaptive approach. They only had one game shift. The vision was handed over to the groups who were planning and constructing parallel to another (see also Figure 3). After the second session the strategic teams presented their plans to the local agricultural community (played by the students) in the “local football clubhouse”.

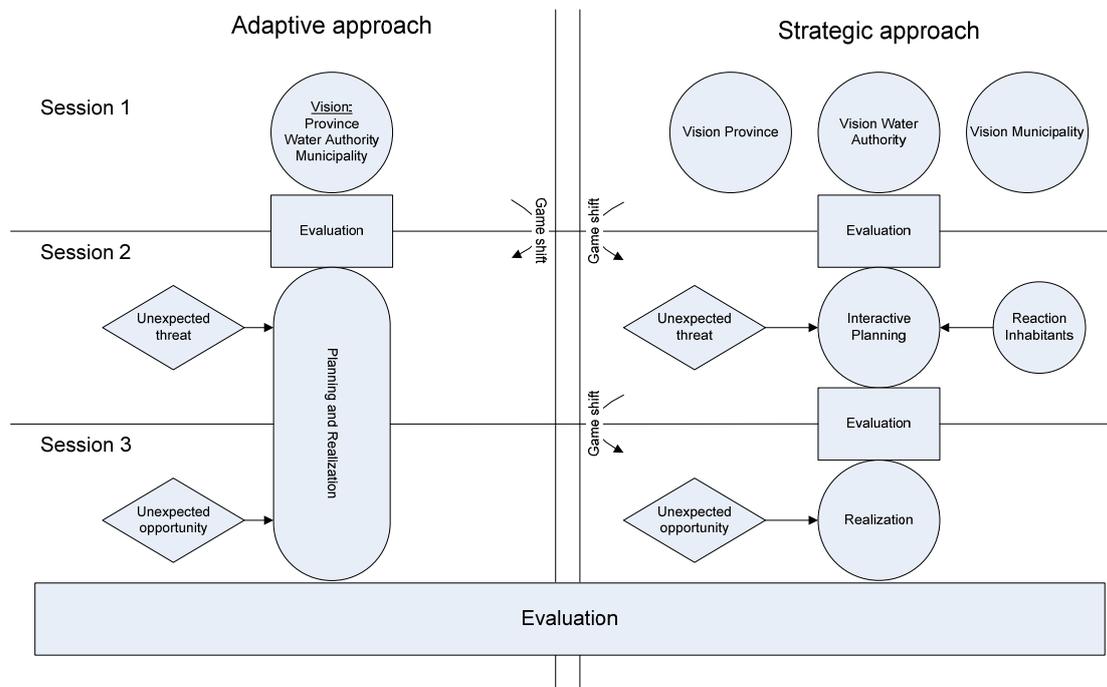


Figure 3: Graphic design of experimental setup simulation game

As depicted in figure 3 the teams were faced with two surprises during the game. The first was an outbreak of the foot-and-mouth disease in the south of the project area. For the adaptive approach this meant that they could not construct in the affected area. It was put in quarantine for half an hour. For both teams the outbreak resulted in a decrease by 1 point in the willingness to cooperate for the affected farmers (scale 1-5). The second surprise was an opportunity. Mr. Bos, one of the farmers who totally did not want to cooperate, deceased. Mr. Bos had no successor, therefore the municipality had the first right to buy the property. Both events represent the dynamic and uncertain conditions that characterise complex systems.

The following observations were done during the experiment and were used for the analysis: Group observations during the game, logbooks, products and a questionnaire.

4. GAME DESCRIPTION

The simulation game Veilen was part of the course Designing and Evaluating Public Policy of the Bachelor Public Administration of the University of Twente. The game introduces the students the village of Veilen. Veilen is based on real cases and real events used in the same research project. In the case of gaming, elements of the reference system (reality) and their relations are presented by design elements like scenario, events, roles, rules and accounting system (Duke, 1980; Peters, Vissers, & Heijne, 1998).

4.1 Scenario: Welcome to Veilen

Veilen is a rural village in the countryside of the Netherlands. The municipality of Veilen mainly consists of agricultural area and of a small historic town centre. On the edge of the town the old water mill is located along the shore of the Veilense Mill Channel. Late 1990's the mill is completely renovated and it is now the first and only museum of Veilen.

Northeast and southwest of Veilen two unique nature areas are situated. Both areas are property of the state nature protection agency. The Province, Water Authority and the Municipality have at the same time policy plans to improve the surroundings of Veilen. The aim of the game for the teams is *"...to design and implement an integrated spatial plan that complies to all policy goals of the different governmental actors involved."*

4.2 Roles

The game consists four main roles: the province, municipality, water authority and agricultural population (consisting 22 farmers with different character sketches). During the game the players were allowed to play the roles to their own interpretation. The characteristics of the role were the starting point to further develop the role via a personal interpretation and interactions.

The province is responsible for implementation of the National Ecological Network (NEN). Completion of the necessary landscape works is a particular cause of delay, but in recent years the acquisition of land has also slowed right down. The Veilen Fields have to be connected via a migration corridor with the Doornbos. The province can choose a southern or a northern route.

The water Authority is responsible for implementing water policies. The Veilense Mill Channel does not comply to current standards. In the light of the European Water Framework directive the channel is given the status of Highest Ecological Level. The Water Authority wants to widen the shores to make micro-meandering and a more natural profile possible. It also creates the possibility to store more water in the channel at periods of high water levels. In respect of WB21 (Water Management for 21st century) the water authority has to create retention capacity in the project area of Veilen. At least 10,000 m³ within the channel and an extra area of 20 hectares has to be constructed for water storage.

The municipality has plans to build a new neighbourhood. They already bought the area for housing. It is in a natural low area where in wet periods water is stored. To assure dry feet, the municipality has to create extra water storage capacity (at least 12 hectares). The municipality also wants to make Veilen more attractive for tourism and recreation. The municipality wants to include the Veilense mill in a cycling and tracking network.

There are 22 farmers in the project area. All are dairy farmers. All have personal character sketches. The willingness of the farmers to cooperate with the government is described by a scale of 1 to 5, respectively "totally not willing to cooperate" to "willing to cooperate". Farmers who are willing to cooperate only cooperate when receiving fair compensation.

4.3 Events, threat and opportunity

A game needs events to focus the players attention on the problem, or a new problem in the game. Duke (1980) refers to it as a pulse, which can be a problem, issue, alternative, or piece of information presented to the players through the game, used to trigger interactions between the players. The game consists of two events, an opportunity and a threat.

During the second session of the game the players were confronted with an outbreak of foot-and-mouth disease in the southern part of the project area. It had consequences for the willingness to cooperate of the affected farmers. It decreased with one point. In the adaptive games the area was put in quarantine for half an hour. The groups were not allowed to implement any measures during that period. While creating a plan the strategic groups had to discuss how to deal with this in their plan.

Thirty minutes before the end of the last session one of the resistant farmers passed away (Mr. Bos). At this moment all the groups were busy negotiating with farmers on land acquisition and were in construction. Although a pity event, the farmer had no successor and the municipality had the first right to buy the property. The players had several options, not buying the land, buying the land and use it for land compensation, buying the land and use it for construction. The players had to rethink their possibilities in realizing the project.

5. ANALYSIS OF GAME PROCESSES AND OUTCOMES

The interaction processes in the different games are analyzed on the level of participation and on characteristics of the cooperation process. The different levels of participation in the process are based on the explanation of Edelenbos (2000). A distinction is made between participants and non-participants. The game framework decided who the participants are. In reality these boundary judgments are also made at certain points in the implementation process. Like via stakeholder analyses for the participant of a stakeholder advisory group.

Table 1: Level of participation in decision-making based on Edelenbos (2000)

| | <i>Level of Participation</i> | <i>Contribution of participants</i> | <i>Decision making</i> |
|-----|-------------------------------|--|------------------------|
| (5) | Co-deciding | Policy development and decision making | Interactive |
| (4) | Co-producing | Policy development, used for decision making | |
| (3) | Advising | Policy development, decision may deviate | |
| (2) | Consulting | Setting agenda, discussion | Not-interactive |
| (1) | Informing | No-input | |

The boundary judgments on participants (and non-participants) are worthwhile to look at, because in reality also processes are labelled interactive which for non-participants are certainly not. In the games using the serial strategic approach the process was interactive for the participants (co-deciding, co-producing). The local community however, did not participate and were informed after the plan was created. In the interaction process the farmers were non-participants. Non-participants, of course, still have their preferences on the outcome of the interaction process. In the construction stage, the non-participants become automatically participants. At the start of the construction stage there is a discrepancy in project/process-related knowledge (different perceptions on process and content). Landowners now have the opportunity to influence the outcome. This might affect the level of acceptance. The former participants and non-participants have different perspectives on the process, just by being part of it or being left out. It influences the level of acceptance of these two types of actors towards the policy goals and solutions (Boedeltje, 2005).

As mentioned the processes of interaction in this table are based on interactive decision making. In the game this would correspond to interactive planning and decision making on the final plan. This can also be generalized for the (real life) implementation process, as there have to be made decisions on buying and selling land property. If the project team actors just inform the farmers about the project plan and that the specific farmer just needs to sell his property, than the process is not interactive.

When the farmers are joined in the discussion how to solve the problem and proactively join the process towards innovative solutions, the process can be labelled interactive. Not all interactive processes show similar process characteristics. Soeterbeek (2000) distinguishes three models of cooperation, see Table 2.

Table 2: Models and the characteristics of the cooperation processes (Kuindersma & Kolkman, 2005; Soeterbeek, 2000)

| | Characteristics of Cooperation process |
|-------------------------|--|
| Arena model | Conflict and Fighting for own goals and stakes (F) |
| Market model | Negotiation and Bargaining on deals (N) |
| Laboratory Model | Creativity en Consensus seeking for combining goals and innovative solutions (C) |

It is clear that interaction processes that are characterized by creativity and consensus seeking are interactive by nature. Interaction processes that are just informing the local community on what is going to happen with their living environment can expect conflict. It is also not unlikely that even when there is a high level of participation, characteristics of the arena model can be recognized at certain moments. It is always questionable if it results in good trust and cooperation relations in future interaction processes. At least it is not an automatic result.

The next table shows the characteristics of the different implementation phases in the simulation game for the different games. For diverse reasons there were too little participants to prolong game A1. The experiment went on with two adaptive games, A2 and A3.

Table 3: Characteristics of the interaction processes

| | | Characteristics of the interaction processes | | | | | |
|--|---|--|--------------------------------------|--------------------------------------|---------------------------------|------------------------------------|------------------------------------|
| | | S1 | S2 | S3 | A1 | A2 | A3 |
| Session 1 | Municipality Water Authority Province | Inter- active (4)* C, N** | Inter- active (4) C, N | Inter- active (4) C, N | Inter- active (4) C, N | Inter- active (4) C, N | Inter- active (4) C, N |
| | Community | No Role | No Role | No Role | No Role | No Role | No Role |
| Session 2 | Municipality Water Authority Province | Inter- active (5) C, N | Inter- active (5) C, N | Inter- active (5) C, N | - | Inter- active (4) C, N, F | Inter- active (5) C, N, F |
| | Community | Not- inter- active (1) F | Not- inter- active (1) F | Not- inter- active (1) F | | | |
| Session 3 | Municipality Water Authority Province | Inter- active (5) N, F | Inter- active (5) N, F | Inter- active (5) N, F | - | Inter- active (5) C, N, F | Inter- active (5) C, N, F |
| | Community | | | | | | |
| * The numbers between brackets correspond to the level of participation in Table 1 | | | | | | | |
| ** The letters C, N and F correspond to the characteristics of cooperation in | | | | | | | |

During all sessions, or phases of the implementation process, the interaction processes among the participants can be described as interactive. It does not however relate to specific characteristics of cooperation. Playing the game, the players sometimes behave cooperative in a creative sense and are seeking consensus. At other times they fight for their own goals and are frustrating the goals of others. The progress of the interaction processes (especially in the construction phase for both strategies) could be described as simultaneous rounds of negotiation, fighting, consensus seeking, decision making and realization. Notice the similarity with the parallel perspective of the concept Interactive Implementation and the *rondenmodel* (Teisman, 2001).

The difference however between the two processes is that the project teams using the serial strategic approach hardly deviated from their original plan during the construction phase (which of course was their task). Although all characteristics are more or less recognized in both approaches, the strategic approaches are more characterized by fighting and obstruction and negotiating, dealing and bargaining. The project teams gave little room for the local farmers to create a creative process towards innovative consensus sought solutions. In the parallel adaptive approach it is noticeable that there was room for the farmers for a creative process. It resulted in both adaptive games that the farmers actively, sometimes pro-actively, joined in reallocation of land property.

Remarkable (or maybe not) is maybe that in sense of personal (material) benefit the farmers in the serial strategic approach were better off in the end. In game S2 and S3 all the farmers received 10% extra on land markets prices and in another some farmers received more land property than they lost for the ecological or water constructs. As the farmers had a dominant power position in the negotiations over land property they showed to be much better businessmen in the strategic approach.

5.1 Outcomes of the interaction processes

Next to the process itself also the outcomes, the result of the processes are analyzed. Basically the scale of 'innovation of the process outcome' is based on the amount of function combinations that are made by the project team. Function combinations show a search for consensus seeking and creativity by the participants. Function combinations show that the participants not only strived to reach their own goals, but also sought ways to achieve their own goals with a spatial quality perspective instead of functionality only. On the other hand, function combinations typically result in lower costs per actor, see section 5.2. The actors have an economic incentive to cooperate. On the other hand it is also a normative choice. The water authority and the municipality can choose for an agricultural water storage site, which is much cheaper than an ecologically designed water storage site. It is a choice between pure functionality and quality, combining water storage and the Ecological Network, saves costs for all governmental participants. I understand the qualification of quality and functionality can be interpreted as subjective. An agricultural landscape, of course, has many environmental and landscape qualities that are enjoyed by locals, tourists and for instance specific grassland birds. The distinction is made because using agricultural land to store water once in a certain period of flooding will stay agricultural land (with its qualities). Giving agricultural land a new destination as water storage area combined with nature we create space for typical wetland flora and fauna that is flooded once a while. It creates an extra dimension to the spatial quality that already exists and it serves as a water buffer. The extent of interweaving interests (goals) and combinations of functions (measures) is important, because this is the respect in which interaction has an added value. It is interesting to find out whether the principal (initiator, different for different goals) was able to link his/her aims to those of other parties, whose resources he/she needs or to come to win-win situations (Driessen, Glasbergen, & Verdaas, 2001).

The results of the different games are scored and put in table to be able to compare the different project deliverables. The final score is the product of the average amount of functions combined by the average amount of responsible authorities involved. For example, in game S1 the participants realized two sites where function combinations were realized. In the first site they combined rural water storage, urban water storage, Ecological Network and recreation (4 goals), by three responsible authorities (province, municipality and water authority). At the second site they combined reconstruction of the Mill Channel with a touristic cycling path. The processes score on coupling goals and coupling responsible actors. The higher the score the more the teams have scored on 'innovation of the process outcome'.

Table 4: Scoring table process outcomes

| Game | Amount of sites with combined functions | Average amount of goals realized per site where function combinations were realized | Average amount of responsible authorities participated in the realized construction | Score |
|------|---|---|---|-------|
| S1 | 2 | $3 = (4+2)/2$ | $2.5 = (3+2)/2$ | 7.5 |
| S2 | 2 | $3 = (3+3)/2$ | $2 = (2+2)/2$ | 6 |
| S3 | 2 | $3 = (3+3)/2$ | $3 = (3+3)/2$ | 9 |
| A2 | 3 | $2.3 = (3+2+2)/3$ | $2 = (2+2+2)/3$ | 4.6 |
| A3 | 2 | $2 = (2+2)/2$ | $2 = (2+2)/2$ | 4 |

When we look at the scores of the process results we see that the serial strategic approaches score more innovative than the adaptive approaches. On average, they have realized per site more functions by more participants. We can conclude that the strategic approach results in a more innovative outcome.

However, we also observed how the results are achieved and by what costs. The end goal does not justify all means. In the next paragraph we analyze by what means the achieved the process outcomes.

5.2 Costs of the project outcomes

The project teams were able to reduce costs by combining functions in the same area. The table below shows the individual costs of the construction if all the participants would realize there goals independent of each other, without function combinations.

Table 5: Costs of all individual measurements to attain the individual policy goals when constructed independently

| Actor | Measurement | Costs |
|------------------------|---|--------------------------------|
| Province | Ecological Network (North, app. 144 ha) OR Ecological Network (South, app. 146 ha) | € 8,760,000.- € 8,840,000.- |
| | Agricultural Water Buffer (20 ha) OR Ecologically constructed Water Buffer (20 ha) | € 1,508,000.- € 2,600,000.- |
| Water Authority | Reconstruction Veilense Mill Channel (€52,000.-/km, total 5.5km) | € 286,000.- |
| | Agricultural Water Buffer (12 ha) OR Ecologically constructed Water Buffer (12 ha) | € 904,800.- € 1,560,000.- |
| Municipality | Budget Recreation | € 200,000.- |

(tracking path, cycling path, picnic sites)

| | |
|----------------------------|----------------|
| Minimum Total Costs | € 11,658,800.- |
| Maximum Total Costs | € 13,406,000.- |

The Ecological Network can be combined with the ecologically designed water buffer. The project teams save €3.16 millionⁱⁱ by combining water storage and the ecological network. The total costs of the total project will be about 10 million Eurosⁱⁱⁱ. The amount an individual participant would save depends on his or her negotiation qualities. Only the project teams of games S2 and A2 did not combine these measures. The project team of Game A2 did not combine it after the decease of Mr. Bos. They realized that at that moment there was little resistance left for constructing the ecological network south of Veilen. At that moment they already constructed the water buffer north of Veilen. Instead of choosing for the least costs they choose for the route of least resistance. They showed adaptive behaviour. The project team of game S2 constructed what was planned. Therefore the project team of the planning phase (session 2) showed less creativity in combining functions.

The project team can also save €52 thousand Euros per kilometre for reconstructing the Veilense Mill Channel by combining it with the Ecological Network. The project team of game A2 was the only one who really combined these two measures, but still only 500 meters.

The project teams create extra costs in negotiating land prices with farmers. The role description of the Province mentions that it is allowed to pay 10% extra for land acquisition, compared to land market prices (in the game €30,000/ha). All land acquisition is voluntary. There is no forced land acquisition in the game. It is up to the players to use this margin or not. The project teams can also buy property of farmers and use it for land relocation with other farmers. Table shows the extra costs the different teams

Table 6: Extra costs and cause of the games

| Game | Extra costs and causes |
|-----------|--|
| S1 | The total property of Mr. Bos (120 ha) was exchanged for a smaller total property of other farmers for land relocation (75 ha). Extra costs: 120 ha – 75 ha = 45 ha (x €30,000.-) = € 1.4 million |
| S2 | No combination of Ecological Network and Water Buffer, did not save € 3.16 million. Paid 10% extra for land acquisition for Ecological Network and Reconstruction of Mill Channel. Extra costs = € 0.63 million |
| S3 | Paid 10% extra for land acquisition for Ecological Network and offered fam. De Graaf a new tractor. Extra costs = € 0.6 million + tractor |
| A2 | No combination of Ecological Network and Water Buffer, did not save € 3.16 million, because of adaptive behaviour |
| A3 | The project team has 75.5 ha of land of Mr. Bos left over after land relocation. Extra costs = 75.5 ha x € 30,000.- = € 2.3 million (but the land can be sold to interested farmers or investors in the near future) |

It is remarkable that all strategic games had to pay more for land acquisition. The project teams of S2 and S3 both paid the extra 10% above land market prices and the project team of S1 compensated the farmers with much more land than needed for the project. In S2 the project team could not explain to the local farmers why they were allowed to pay 10% extra for the Ecological Network and why not for the Reconstruction of the Mill Channel. The farmers stuck to their guns and demanded 10% extra for land acquisition for the reconstruction as well. The project team had to give in.

The extra costs of the project teams of A2 and A3 resulted from adaptive behaviour. Both

ⁱⁱ The costs of the water authority to construct an ecologically designed water buffer plus the costs of the municipality to construct an ecologically designed water buffer. The construction of the water buffer is then included in the costs of the Ecological Network. The individual costs result from negotiation among the participants.

ⁱⁱⁱ Max. total costs – water buffer = €13.4 million - €3.16 million = €10.24 million

reacted on the decease of Mr. Bos by buying the property. The project team of game A3 used it wise and compensated the farmers affected by the Ecological Network with land. It resulted in a land relocation project, which in reality causes extra costs in administration. The extra costs of S1-3 are caused by processes that are characterised by negotiation, bargaining and conflict. The extra costs of A2-3 are caused by processes that are characterised by negotiation, bargaining and cooperation.

The type of extra costs can be linked to the strategy used. By forcefully wanting to construct what was planned the farmers were in a dominant power position. For success the project teams needed the land property of the farmers, but were only able to get it voluntary. Therefore the farmers of game S1-3 were able to make good deals out of the process. They all received the extra 10% or, even better in game S1, received extra land property. The farmers of game A2 and A3 were more part of the creative process. The farmers, also here having a strong power position, had a less strong power position as the project teams were flexible in constructing their measures to achieve their goals. If a certain farmer appeared not willing to cooperate, the project teams went to their neighbour. It was a search for the route of least resistance. In game A2 it was already shown by the emerging behaviour of family Visser buying the property of family de Jong. After the decease of Bos the project team chose for the southern route for the Ecological Network as it was at that moment the route of least resistance. In game A3 it was shown by the land relocation project among seven farmers after the property of Mr. Bos came available.

In real cases we already see that project teams are more flexible in the construction phase. Most project outcomes differ to the project plan. A weir is constructed 100 meters downstream. A farmer was willing to sell extra property, so a water storage site could be created on a spot which was not planned for that purpose. However the way the strategic project teams are focused on implementing the project plan, rather than achieving the project goals, result in dominant negotiation positions for farmers (when combined with voluntary cooperation).

5.3 Dealing with surprises

Within the game two surprise events were included with which the project teams had to deal with. The first was the outbreak of the foot-and-mouth disease. The second was the passing away of the reluctant farmer Bos which land property became available to the municipality. It ends with some modest conclusions.

Foot-and-mouth disease outbreak

The outbreak affected the groups using the strategic approach during their planning phase. The only effect it had on these groups is that none of the groups included the properties of the affected farmers in the plan. Also during the implementation of the plan none of the groups changed their plans and included one of the affected farmers in large construction works. The only construction which included two of the three affected farmers was the widening of the Molenbeek.

The outbreak affected the groups with the adaptive approach while they were already in interaction with the farmers' community. Physically it affected the projects, because the project teams were not allowed for half an hour to construct anything on the properties of the affected farmers, because they were in the quarantine zone. The project team of game A3 did not include the affected farmers in large constructions of the project, other than widening the Molenbeek. Only the project team of game A2 included the affected farmers in a large scale construction project. After the Bos event the project team adapted their plan and constructed the ecological network zone on the property of the affected farmers. Although the willingness of the affected farmers decreased with a point (scale 1-5) this still was the route with least resistance according to the project team.

The decease of Mr. Bos

Mr. Bos totally did not want to cooperate with the government to construct the ecological network zone. The decease of Mr. Bos gave the opportunity to the project teams to successfully complete their projects. All but one mentioned that without this opportunity it would have been at least much harder to complete the project successfully.

The project team of game S1 used the property extraordinary by compensating farmers with much more hectares of land. The farmers were quite satisfied. The project team did use the opportunity, however not very wise, it resulted in extra costs.

The project team of game S2 only used it for the construction of the ecological network that was constructed over the property of Bos. They mentioned that the event was mere luck and it was the only way to succeed the ecological network zone, because Mr. Bos was the utmost hardest opponent. With the rest of the property nothing was done.

The project team of game S3 did not use the released property of Mr. Bos in any sense. Their argument was that for completion they did not needed it, because they had nothing planned on his ground. However, they also did not use it for land relocation and finally paid all farmers a 10% extra compensation.

The project team of game A2 reacted adaptively on the released property of Mr. Bos. The project team decided to change the route of the ecological network via the south. In first instance the project team realized, from their discussions with the agricultural population, that the northern route was the one of the least resistance. With the decease of Mr. Bos, as a strong opponent, everything changed. The project team immediately restarted discussions with the southern route farmers and achieved realizing the southern route (including foot-and-mouth disease affected farmers). Other parts of the Bos property was used for compensation and it made it possible to construct the touristic cycling path alongside a part of the Mill Channel. The project team of game A3 used the property for compensation and land relocation. They used it wise and after delivering the project they had about 72 ha of property left over. The project team thought it would not be a problem to sell the property in the future to a local or outside farmer.

It can be concluded that the project teams using the strategic approach avoided the negative situation. The project team of game A2 although in first instance did not want to construct on the properties of the affected farmers. However when the Bos event happened, they did not avoid the affected farmers and were able to find a solution.

The interactions of the project teams using the adaptive approach with the local community showed much more characteristics of creative and cooperative processes, even though the results show less creativity and innovation. The project teams therefore had the ability to react on the events in discussion with the local community. The project teams using the strategic approach showed much more characteristics of dealing and conflict over the construction of the plan. It resulted in less use of the opportunities given, because their plans restricted them.

6. DISCUSSION AND CONCLUSIONS

A simulation game was used for students to learn the complexity of implementation processes. It was also used as comparative experiment. It compared a serial strategic approach with a parallel adaptive approach (Interactive Implementation).

First, a simplified model of reality was created. Next we played and learned, now it is time to reflect and translate it back to reality (Peters, Vissers, & Heijne, 1998). The game used two normative models of the implementation process: the serial strategic model and the parallel adaptive model. Three groups of students completed three games with the strategic approach and three groups of students completed two games with the adaptive approach.

We learn from the analysis that the groups using the strategic approach come to more innovative plans and outcomes than the groups using the adaptive approach. However, when we analyze how the outcomes are achieved we see that the strategic games faced more obstruction and conflict. It resulted in higher costs. The participants were asked to interact in a reasonable way, and not just blocking the project as a farmer. With modesty I conclude that the results of the strategic games confirm the statement of Geldof (2001) that many plans never get off the ground, because they collapse under their own beauty.

The interactions of the project teams using the adaptive approach with the farmers much more characterised by creativity and cooperation. The project teams therefore had the ability to react on the events in discussion with the local community. The project teams using the strategic approach showed much more characteristics of dealing and conflict over the construction of the plan. It resulted in less use of the opportunities given, because their plans restricted them.

Compared to the adaptive groups the strategic groups knew very well what to do in the construction phase: implementing the plan. It created a polarized situation between the government and the community, characteristics of a vertical hierarchy. The adaptive groups did not have a detailed plan when starting to construct. They learned by interacting with the local community what the optimal route was to completion. It showed characteristics of a horizontal network and a learning government.

Time to translate it back to reality. The serial strategic approach faces (or even induces) conflict and obstruction. Therefore, with increasing complexity of integrated water management the chance of achieving policy goals will decrease in processes using the serial strategic approach. They are likely to collapse under their own beauty. (With modesty, because I realize a game is just a game) I conclude that in reality the adaptive approach suits better to the complex governance system to implement complex policy issues. The adaptive strategy allows the government to learn and interact towards a suitable outcome. It may not be the most innovative outcome, but it will be an outcome that fits the system, realized via a route of least resistance.

To end this paper some words on the game as a learning tool.

The game as a learning tool

‘I hear and I forget, I see and I remember, I do and I understand’
(Confucius, Chinese Philosopher, 551-479 BCE)

Within courses for students and practitioners (further referred to as students) learning is mostly about gaining insights in theoretical issues. Knowledge is gained by listening to teachers in lectures, by reading words, theories, models and figures in textbooks. Students try to get grip and understanding of the complexity of policy implementation. By doing, although by a simplified game, students undergo the complexity of the system and understand.

In this paper the implementation process is addressed as an interaction process. In the learning process on behaviour it is not about cognitive knowledge. It is how one can react and deal within certain circumstances and what it can cause. In this game it is done by the events, introduced by the game leader. In the adaptive games events emerged also out of the students' interactions (family Visser buying the property of family De Jong in game A2). Playing the game students learn the dynamics of the complex system, that action causes reaction, causes reaction, causes reaction. The students learned to deal within certain rules and under certain circumstances. They also learned that, being an actor within a governance network, you are not the only one trying to change the environment. To achieve your goals compromises have to be made. In the interactions they realized they do not possess all knowledge. The students were in the game confronted with other perspectives and new insights (de Caluwé,

Fundter, van 't Spijker, & Joldersma, 1995). The students first gained specific actor knowledge (the “province” learned about policies of the Ecological Network). Next they were confronted with other knowledge. It stimulated them to broaden their scope on the situation and to adjust their interpretation framework. The simulation game therefore is a tool for students to learn on all elements of governance (Kuks, 2004), based on interactions and reflection on their own behaviour within a setting of spatial policy implementation.

ACKNOWLEDGEMENTS

This research is supported by the Dutch national program “Leven met Water” and is part of the project “Interactieve Uitvoering”. I would like to thank Frans Coenen and Herman Oosterwijk to provide time and space for the simulation game in the course “Evaluation and Design” of the Bachelor Public Administration of the University of Twente. Hans Bressers and Maya van den Berg are thanked for their help during the game. Last but not least, the students for playing enthusiastically.

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