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The Politics of Resilience in the Dutch 'Room for the River'-project

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Abstract

An increased focus on the concept of resilience in flood protection has led to the development of a comprehensive flood protection strategy in the Netherlands which stresses the need to provide 'Room for the River' rather than building dykes. But how can a resilient solution in flood protection be successfully implemented? Using insights from the major Dutch flood-protection project 'Room for the River', this article studies the governance of resilience. From a political perspective, resilience is often a win-lose game with many uncertainties. The actors involved have strong incentives to exploit these uncertainties and to hamper resilience based policies. The 'Room for the River'-project was based upon the idea of resilience and had a win-lose character. Nevertheless, the many actors involved, with their conflicting interests, managed to reach consensus by broadening the agenda and by making flood protection a multi-issue game.

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Keywords: resilience;governance;water management;flood protection

1. Introduction

Rising sea levels, melting glaciers and more extreme weather conditions mean that flood protection is once again high on the agenda in many countries. In this context, the concept of 'resilience' is frequently applied. Apart from a focus on ex ante measures, flood protection and water management in general increasingly incorporates the issue of how resilient systems and societies are in their response to flooding.

Often, the concept of 'resilience' is interpreted in a purely technical sense, the central question being how a technical or physical system can be made resilient. However, resilience also involves an important governance component. How can a resilient solution in flood protection be successfully implemented? In this paper, we argue that the resilience concept has specific characteristics which warrants a more thorough assessment of the governance

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of resilience, more specifically the 'politics of resilience'. This focus on the implication of resilient responses has received little attention in academic contributions. We will discuss a major Dutch flood-protection project that was based on the idea of resilience, and our main focus will be on the governance aspects, in particular the relation between resilience and governance.

2. Resilience and the politics of resilience

2.1. The 'resilience' concept explored

Before we turn to the issue of governance of resilience, we will first pay attention to 'resilience'. Resilience is derived from the Latin word *resilio*, meaning 'to jump back'.[1,2] In essence, resilience assumes that disturbances occur, but can be absorbed or 'controlled'. Consequently, resilience refers to the capability for stabilization after a disturbance has occurred. As such, resilience is the antitheses of the concept of anticipation, which seeks 'to predict and prevent potential dangers before damage is done'.[3] Whereas anticipation is particularly effective in preventing from specific threats, resilience is more effective as uncertainty, dynamics and volatility increase.

However, the term resilience is not that easily operationalized. Application of the concept in different scientific contexts has highlighted different aspects of stability. In physics and engineering, resilience refers to 'the ability of a material to return to its former shape after a deformation'[4] and is considered more or less synonymous to adaptability or flexibility.[5] But in social science research, where resilience is applied to the behaviour of humans, organizations or social contexts, resilience refers to the 'ability to resist disorder'[6], 'to continue its existence, or to remain more or less stable, in the face of surprise, either a deprivation of resources or a physical threat.'[7]

In short, different scientific disciplines attribute different meanings to resilience and use the concept to denote different elements of stability. The first to acknowledge this fundamental difference was ecologist Holling, who identified *engineering resilience* and *ecological resilience* as distinctive types with distinctive characteristics.[8] Whereas the first notion of resilience focuses on 'efficiency, constancy and predictability' and the '*efficiency* of function', ecological resilience focuses on 'persistence, change and unpredictability', maintaining the '*existence* of function.'[9] Whereas engineering resilience assumes a return of a system to its former stable state after a disturbance as quickly as possible either via the speed of the recovery process or the reduction of the impact, ecological resilience assumes the possibility that a system can return to a 'stable' state that does not resemble the original stable state, as can been seen in Fig. 1.

Figure 1. Engineering resilience (A) versus Ecological resilience (B)

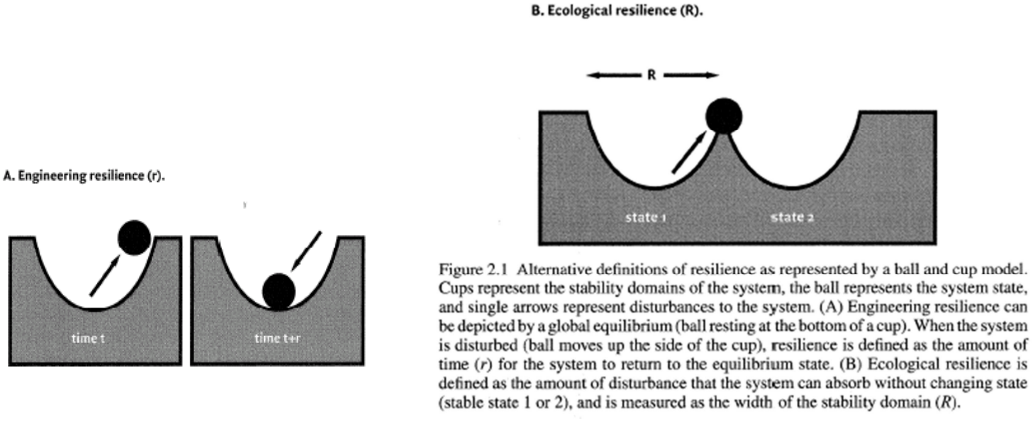

Figure 2.1 Alternative definitions of resilience as represented by a ball and cup model. Cups represent the stability domains of the system, the ball represents the system state, and single arrows represent disturbances to the system. (A) Engineering resilience can be depicted by a global equilibrium (ball resting at the bottom of a cup). When the system is disturbed (ball moves up the side of the cup), resilience is defined as the amount of time (*r*) for the system to return to the equilibrium state. (B) Ecological resilience is defined as the amount of disturbance that the system can absorb without changing state (stable state 1 or 2), and is measured as the width of the stability domain (*R*).

Source: Gunderson, LH. Adaptive dancing: interactions between social resilience and ecological crises. In Berkes, F, Colding, J, Folke, C, editors. *Navigating Social-Ecological Systems, Building resilience for complexity and change*. Cambridge: Cambridge University Press;2003.p.35.

In some disciplines the ecological resilience concept has evolved to also encompass 'the interplay of disturbance and reorganization within a system as well as […] transformability, learning and innovation, i.e., social-ecological resilience'.[10] With this shift the importance within the resilience concept of the role of humans and their behavior increases and therefore the focus migrates to a higher level of institutions and governance structures increases relative from more instrumental and more detailed measures.[11]

The recognition of the existence of different forms of resilience is no mere academic exercise. Its importance cannot be overestimated when studying the real-world implementation of resilient solutions; in our case the governance processes of the first large-scale flood protection project in the Netherlands that made use of the concept.[12] As we have already indicated, although resilience is most often defined in technical or physical terms, it also has a political dimension, which we refer to as the 'politics of resilience'. Although much attention is paid to resilience solutions in terms of technical solutions and physical systems, the key focus of our analysis is aimed at the governance level. Based upon our short theoretical exposé, a number of issues can be identified that would warrant increased attention towards the governance of resilience.

2.2 Resilience: a wicked, contested concept

First of all, the term resilience in practice is used by many different actors with widely diverging motives and interests, which tend to remain unarticulated. As a result, it is often unclear just what is meant by resilience. Furthermore, although the previous description of the concept might suggest conceptual clarity, just exactly how anticipation, engineering resilience and ecological resilience differ from each and relate to other remains unclear. In fact, the concept lacks a thorough empirical grounding leading some scholars to conclude that "[r]esilience has been used to describe the ability […] to absorb shocks in order to maintain a steady state, and also the ability to rebound back from shocks to a new steady state. At this rate, what isn't resilience."[13] This becomes particularly problematic if the concept is applied to real world solutions, for example in flood protection projects:

- A precise distinction between anticipation and resilience is problematic. For example, is a flood protection project that seeks to develop a more resilient capacity of areas which would allow more 'Room for the River' an example of anticipation (the prevention of a particular disturbance, in this case floods), or resilience (the project aspires a more flexible response than dikes would provide)? Or could programs even be considered as a hybrid phenomenon of part anticipation, part resilience?

- In practice, most solutions in flood protection do not easily conform to the two ideal-types of resilience that were distinguished by Holling. Again, real-world solutions seem to offer complex, hybrid forms which constitute characteristics of both engineering and ecological resilience. The design of a technical system with elements of a 'defence in depth' for example, or adjusted operations because technology can be employed in different ways over time. For example, the largest element in the famous Dutch Delta works, the 9km long Oosterscheldekering, which was primarily designed to protect areas from the sea is simultaneously used to manage water saleanation in the estuary it protects.

2.3. Different types of resilience influence the knowledge position of stakeholders

What are the consequences of these two types of hybridity for governance and decision making?

If a resilience engineering perspective dominates in the envisioned design, the efficiency of function gains precedence. Then governance regimes would facilitate processes and behavior that would allow for the fastest return to a stable state; the current stable state. Actors with vested interests will benefit from this approach to resilience.

Solutions from a resilience engineering perspective 'simply' aim to reduce the impact and duration of the disturbance and return to the original stable state that existed before the disturbance. Although the actual processes to assess the impact of these interventions can be quite complex, they are nevertheless to a large extent quite predictable to stakeholders. This means that stakeholders can relatively easily assess the benefits and costs of proposed solutions for themselves as well as for other actors in the process. Engineering resilience therefore by and large produces situations where stakeholders are capable to assess the impact.

This is much more difficult for actors when the resilient solution under consideration is more inclined towards ecological resilience. In these circumstances, the design of a resilient response that would actually allow for stabilization in new and different stable states, would produce two effects that would impact the capability of actors to assess the impact of these measures. First of all, actors will face more unpredictability in the assessment of the impact of a particular resilient response. Trying to assess such an impact and the possibilities of new stable states will be much harder and will leave decision makers with inherently more uncertainties about their own situation. Secondly, much more unpredictability will arise in the assessments of what the effect will be on the other actors. In short, a more ecologically resilient solution would result in a situation where actors are less capable to assess the impact of that solution in terms of costs and benefits for themselves as well as for others. The consequences of these effects for the governance of resilient programs are quite obvious.

Although a solution that can be identified as resilient engineering solution could have costly and unpleasant effects, the more predictable, efficient solutions will be more or less be relatively straightforward to negotiate between actors. First of all because the solution more or less continues the current status quo. Furthermore, stakeholders can be more easily convinced of the overall systemic value of the solution as all stakeholders stand to gain from the improvement. Although sacrifices need to be made, all actors involved stand to gain from the proposed solution – a win-win situation.

A solution with characteristics of ecological resilience will vastly reduce the capability of stakeholders to make accurate predictions about the effects of the solution, both for their own position as well as that of other stakeholders.

To conclude, ecological resilience will result in more uncertainties for the actors involved. Uncertainty might evoke political resistance. Uncertainty about whether resilience is 'engineering' or 'ecological', might also evoke resistance. So both 'ecological' resilience and hybrid forms of resilience produce uncertainty and uncertainty might be an incentive for political resistance. In addition to this, the distinction between anticipation and resilience is also blurred. Many types of resilience are anticipated or planned. Planning for resilience with its inherent uncertainties is almost always a source of conflicts and politicization.

2.4. Different types of resilience, win-lose games and the role of information

The more akin the response is to ecological resilience, the more uncertainty enters the game; the possibility of hitherto unexplored stable states threatens the current status-quo and threatens power relations between stakeholders. Thus, one could expect solutions that might be characterized as ecologically resilient to more often result in a game of win-lose, having two variations:

- One party receives ex ante protection, while the other party has to be resilient and therefore faces increased flood risk or;
- There is a split incentive: one party invests in resilience (and bears the costs), and the other reaps the benefits (protection).

Of course, this win-lose dimension will more often than not result in political conflicts, and have consequences for society's acceptance of resilience and impede political decision-making on the subject. If, in addition, winners and losers find themselves in a network of interdependencies – which is almost always the case in modern society – this can have an enormous impact on decision-making. The losers will attempt to block decision-making about

resilience; thanks to the aforementioned interdependencies they will often have the means or opportunity to do so. An important strategy in exercising the power to block progress is that of questioning the knowledge and information provided by experts. Of course, it is always possible to raise questions about how the danger was calculated, the protective effect of measures and the need for resilience as opposed to anticipation. The more contested this information is, the more legitimacy the parties have in their power to block progress.

In summary, this is how the governance issues evolve: (1) resilience has its inherent uncertainties, (2) resilience requires anticipation and planning, (3) the introduction of resilience is often a win-lose game, (4) losers will apply their blocking power (5) and have strong incentives to ensure that knowledge and information is contested, (6) as a result of which the basis for resilience is undermined and their resistance is legitimized. In the next section, we will explore the consequences of this for the governance of a Dutch flood protection program.

3. The case: The 'Room for the River' flood protection program

3.1. Introduction; the need for an integrated system approach

There are four major European rivers that flow through the Netherlands towards the sea: the Rhine, Maas, Schelde and Eems. This means that the Netherlands is situated in the delta of four rivers. Two of these deltas, those of the Rhine and the Maas, cut right across the Netherlands. If these rivers were to flood, this would strike at the heart of the Netherlands, resulting in significant damage and, potentially, large numbers of victims.

River- and flood management of course requires an 'integral' or 'systems' perspective: policy analysts and policy makers should take the entire rivers and its functions into account, not just regional sections of the river or just the flood protection function. A systems perspective also means taking into account a large number of feedback and feed-forward mechanisms between the sub-systems (the sub-basins). Water from an upstream sub-basin flows into a downstream sub-basin. This determines the water level downstream. Surges in the water level downstream can in turn affect the water level upstream. There are many other forms of feedback. Building dykes can lead to an increased water flow downstream. Inhabitation can lead to a more rapid run-off of rainwater, but also to higher water levels because the cross section of the river is narrowed. The water level determines the use of the river (agriculture, shipping) and this in turn determines the water level. Interaction between catchment areas can be sequential and parallel. In all these mechanisms there are also uncertainties concerning precipitation, transport of clay and sand, and flood volumes.

This article is not intended to give a detailed description of these system approaches. The assumption is that a system approach is inherent to flood management, but at the same time, a system approach is very difficult to implement from a governance perspective. A systems perspective means that many actors will have to be involved, with often conflicting interests. Inherent to a systems approach are its many uncertainties and disputable choices (system boundaries, data, methods etc.). As said in the conceptual section, an environment with conflicting interests will always know many incentives to exploit these uncertainties and disputable choices.

3.2 Flood protection: the change of a policy paradigm

The flood protection policy in the Netherlands has for a long time been based upon a simple and powerful paradigm: whenever the Netherlands felt insecure and unsafe, it heightened and strengthened its dikes. Of course, other additional measures were also taken, but dike construction and maintenance was the most important of these. As early as the 1980s and 1990s, though, experts began highlighting the fact that this dike strategy could not continue indefinitely. They drew attention to three key changes, which resulted in a change of the policy paradigm[14]:

- Climate change will periodically lead to a great deal of rainfall upstream of the rivers, as a result of which large volumes of water will occasionally flow through the Netherlands, to a much greater extent than has been the case until now.

- The part of the Netherlands that is below sea level is gradually sinking to an even lower level, a phenomenon that is referred to as 'settlement'
- Climate change results in a rise in sea levels, which makes it more difficult to pump the river water that flows in below sea level into the sea And so on

Always responding to these changes simply by reinforcing the dike and increasing their height could actually be said to make the Netherlands intrinsically less safe. This strategy would require extremely high dikes, in view of the anticipated high water levels and ongoing settlement. The rivers wedged between these high dikes would need to deal with extreme water levels, as enormous masses of water would flow through the Netherlands. If, in that scenario, a dike should be breached, huge, unprecedented volumes of water would flow onto the land, with a high likelihood of much human suffering and major damage.

The experts therefore called for a new paradigm – the project 'Room for the River' being the implementation of this paradigm. Whereas dikes constrict the river, hemming it in, Room for the River gives it space. Room for the River can manifest itself in the form of a broad range of concrete measures, including the following:

- widening the riverbed, in other words shifting the dikes inland
- excavating floodplains, making more cubic metres of space available for water
- digging shortcuts that enable water to be drained quickly to the sea via an additional riverbed in the event of high water
- building flood retention zones, which are polders along the river that are designed in such a way as to prevent major damage from occurring in the event of temporary flooding once every 10-25 years. The effect of this measure is to lower water levels.

In the wake of two near-disasters in the mid-1990s, this Room for the River strategy was widely accepted, and it now forms an integral part of safety policy along the rivers.

The construction of flood retention zones in particular can be seen as a shift from anticipation to resilience: whenever too much water flows through the rivers, polders are submerged in order to prevent the water levels in the rivers from rising too high. Is this 'engineering' or 'ecological' resilience? That might be uncertain: the impact of polders being submerged is hard to predict. Is this a complete shift from 'anticipation' to 'resilience'? No, 'Room for the River' might be framed as 'anticipated or planned resilience'.

3.2. 'Room for the River': the politics of resilience

In section 2, we explained that resilience is an intrinsically politically sensitive issue. What makes the 'Room for the River'-project politically sensitive? What were the risks for the vice-minister of Infrastructures, who had to manage the decision making process and to collect enough measures to cope with the new normative inflow?

Fragmentation

The policy makers opted for a systems approach and carried out of study of more than 700 'Room for the River' measures along the Rhine and the Maas, analyzing each of these measures in terms of their costs and their impact on water levels and safety. Inherent to this approach is that many political players were involved, with different interests. The two rivers are one system, but the political structure is fragmented: it is a patchwork of municipalities, regions, water boards and interests groups.

Split incentive structure

Many of these measures require actions to be taken in one location, but another location that gets the benefits: A flood zone needs to be created in one location (costs) in order to ensure that the dikes are not breached at a different location (benefits). In other words, the benefits and costs of measures impact on diverging locations. This is known

as the 'split incentive structure'. In the municipalities and regions responsible for bearing the cost of resilience (for example in the form of a flood zone), there will understandably be a lot of political and social unrest.

Contested objective

Before the introduction of the 'Room for the River'-policy, the safety policy for the Rhine was based on a maximum inflow of water of 15,000 m^3 per second on the border between the Netherlands and Germany. Experts had calculated that climate change made it necessary to increase this norm. They initially called for 16,000 m^3, but in the light of worsening climate forecasts they eventually decided that an inflow of 18,000 m^3 needed to be accommodated, and this was referred to as the 'normative inflow'.

Politicians often have difficulty in envisaging figures of this kind, but do have a sense of the consequences that these figures can have for measures that need to be taken along the rivers. In view of the substantial increase in the normative inflow, large-scale and potentially controversial measures were to be expected. This prospect can lead to a lot of potential resistance and a critical attitude towards the assumptions that formed the basis for the normative inflow that has been calculated.

The figures may acquire more meaning for the politicians involved if they are placed in perspective. Not at any point during the near-floods of the mid-1990s was the rate of 15,000 m^3 per second reached, although the volumes flowing into the Netherlands then were already considered extremely high. The highest water level ever measured was 15,700 m^3 per second, in 1926. As a result, 18,000 m^3 per second may well seem overly high or exaggerated to those public administrators who predict that this extra heightening of the dikes is likely to result in controversial projects. This can easily serve as an incentive to contest this objective and argue for a lower normative water level.

Contested impact

The split incentive structure can also serve as an incentive for politicians from the regions bearing the costs to contest the measures that affect them. For example, this may be by criticizing the positive impact anticipated for water safety or challenging the calculation of the costs. Politicians can commission agencies to conduct alternative calculations with different results. This can at the very least cause delays but also undermines the legitimacy of decision-making.

Exceeding budgets and postponements

Many projects are sizeable civil engineering projects. These kinds of projects can encounter all kinds of problems during implementation. Projects can easily exceed their budgets and realisation can incur serious delays.

3.3. 'Room for the River': the decision making process

Given these characteristics, the decision making process on the 'Room for the River' was perceived as a high risk process. To to what extent did these foreseeable problems actually materialise?

Fragmentation and split incentive structure

The most important question was how to deal with the split incentive structure and the social and political resistance that is inherent to it. Resilience is quite clearly a win-lose game and the losers therefore put up a great deal of resistance.

The key strategy had two elements. First, the vice-minister broadened the agenda. She argued that the decision making process on the measures was not only about flood protection, but also on 'spatial quality', e.g. on tourism, harbor expansion, new forms of housing (on the water), the creation of new natural environments and new economic activities.

Second, all the actors involved were invited to put issues on this very broad agenda. They came with all types of sometimes very specific issues. This proved to be a game-changer: the process shifted from a single-issue to a multi-

issue game – in which implementing measures aimed at accommodating 18,000 m^3 was merely part of the multi-issue agenda. This transformation had five important effects:

- It created incentives to take part in the process. It made it attractive for actors to take part in the process of negotiating about the measures to be taken. For these parties, the many other issues always involved some level of gain as well as some occasional pain. This meant that refusal to take part was not an option, as it would lead to decisions being made without them on issues of importance to them.
- It created incentives for give-and-take. The multi-issue approach had a depoliticizing effect. Many parties were prepared to make concessions on one issue in return for compensation on other issues. Compared to politicians who did not show a willingness to contribute to accommodating the 18,000 m^3, those who did show such willingness could also often count on more rewards with regard to other issues.
- It created incentives for learning processes. The many different issues on the agenda also made new and unusual combinations possible. For example, one municipality wished to expand its tourist infrastructure. So what happened? Widening and deepening the harbor for pleasure craft also made a contribution towards accommodating the 18,000 m^3. Numerous other combinations also emerged.
- It created incentives for cooperative behavior. In the course of the process, 'changing coalitions' emerged – different coalitions of supporters and opponents for each issue. These changing coalitions created strong incentives for cooperative behavior. An actor's opponent on issue A, proved to be a proponent on issues B, which forced this actor to behave moderately vis a vis this opponent. Put differently, the multi-issue game created interdependencies that compelled cooperative behavior.
- Of course, it is not possible to get all parties on board: There was a number of parties who ultimately had to accept measures even though they were very much opposed to them. However, in the multi-issue process, a critical mass of 'winners' was created – parties who had emerged from the multi-game issue with an attractive package to show for it. At a certain point, it was in the interest of these parties that the decision-making process achieved closure, even if that also damaged the interests of a limited number of parties -- they were prepared to put these parties under pressure to accept their loss.

An example is the multi-issue game, played in the Overdiepse Polder. The Overdiepse Polder is one of the places where the river will be given more space. Thanks to the participation of local polder residents and farmers, several other issues were put on the agenda. As result of this, the outcome of the decision making process was not only a retention area, but also an economic restructuring (a number of farmers will build up a new existence elsewhere), a nature reserve, a series of traditional, artificial hills that have a high position and will offer space to nine agricultural companies and a network of cycling paths. Another example is the Avelingen business area in the city of Gorinchem. 'Room to the River' has been linked to the redevelopment of this business area. A high water channel in the River Merwede will contribute to the accommodation of water, but also gives a boost to the development of this business area. The channel will be deep enough for shipping and an extra container park could be constructed along the quayside.

3.4. Contested objective

The objective did indeed throw up questions and lead to discussion, but this discussion was conducted in an orderly and politically disciplined way. The ultimate solution was for the programme to be based on 16,000 m^3 per second with measures already being taken to enable it to be upscaled quickly and easily to accommodate an inflow of 18,000 m^3 per second. The political dexterity of the vice minister and the status of the institute that made the calculations for the objective certainly contributed to this. But equally important was the fact that the attractiveness of the multi-issue game meant that the incentive to contest the normative inflow disappeared. Investment was therefore made not so much in ensuring that the calculation of the normative inflow was as rigorous as possible, but in organising a multi-issue process, which meant that the precise calculation of the normative inflow was no longer an issue.

3.5. Contested impact

The ministry quantified the impact of measures and created a visually attractive model, referred to as a 'box of building blocks' (‘blokkendoos’). This modelled the whole of the river zone and included some 700 measures. Within the model, it was possible to activate each measure and each combination of measures, immediately showing the impact on water levels, the likelihood of flooding and the total costs. In fact, it served as a decision-support system. But unlike many similar systems, local and regionals politicians and interest organisations did not feel that the solutions resulting from the system were more or less imposed on them. On the contrary, this box of building blocks made it possible to put together a large number of combinations of measures that all met the safety objectives and also remained within budget. Politicians did not, therefore, feel constricted by it: it actually gave them space in which to negotiate. Put another way, rather than directing the decision-making, expert knowledge facilitated it.

3.6. Exceeding budgets and postponements

In the end, the negotiations resulted in the selection of 39 measures from a list of 700 potential projects. In spite of the potential for controversy, widespread agreement was reached.

In terms of implementation, the national government left the choice of the mode of implementation to parties at local level. If desired, the central government was willing to take over implementation. In that case, the risks, including those of a financial nature, would be borne by the central government. However, government authorities at lower levels were also allowed to indicate a willingness to take control of the project themselves. In that case, the central government made the budget available and the party at a local level was able to implement the project in its own way.

The arrangement ensured that parties were able to seek roles in which they felt most comfortable. Put differently, every stakeholder involved could contribute according to its strengths and were motivated to do so.

The result in the end was that the whole process appears to have been achieved within budget. The project was scheduled for completion in 2015. It now appears that two or three projects will be subject to some delay, but the others have or will be completed on time. This successful project management result is definitely related to the broad consensus and the flexibility provided for implementation.

4. Conclusions

Resilience is not only a technical issue, it is also a political issue. From a political perspective, resilience is often a win-lose game with many uncertainties and will therefor evoke social and political resistance. From a technical perspective, a systems approach is needed. However, from a political perspective a systems approach results in very complex decision making processes.

The Dutch ‘Room for the River’-project was based upon the idea of resilience. It was perceived as high risk political decision making, given the many potential win-lose situations, the many actors involved with their conflicting interests and the many uncertainties.

The main strategy of the vice-minister had two components: broadening the agenda and changing this project from a one issue game to a multi-issue game. This created incentives for the actors to work together and to link the ‘Room for the River’ measures to their own interests. They no longer had an interest in challenging the information provided by the experts. It also changed the role of experts: their focus was less on explaining the need for these measures and the impact of these measures – and more on facilitating the decision making process and giving room to the decision makers.

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