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Climate adaptation processes in a multi-level governance setting

Principles for effective system synchronization in the Dutch Delta[1]

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Abstract

Climate adaptation is essentially a multi-level activity because climate change impacts upon various geographical and functional scales in different ways. That means that climate adaptation is a multilevel challenge which presuppose the ability of governance actors to synchronize their activities on various governance levels in such a way that effective and legitimate adaptation strategies result.

To understand this challenge we develop in this paper a theoretical framework with which we can describe the characteristics and dynamics of multi-level governance systems, and the way synchronization of governance levels arises. Classical models of top-down or bottom-up governance seems to be not applicable in these multi-level systems which are characterized by non-linear and erratic dynamics and feedback patterns. The conceptual framework is used to get more insight in the way synchronization emerges, and with what effect. We elaborate this framework by analyzing the Dutch Deltaprogram especially with regard to the so-called Deltadecision Rhine – Meuse Delta.

Keywords

Multi-level governance, synchronization, climate adaptation

1. Introduction

As a low-lying delta area, the main challenge of climate adaptation in The Netherlands is related to water. When the climate changes the water safety as well as the water supply of The Netherlands will come more and more problematic (Deltacommission, 2008). The water safety is threatened by a combination of higher river water discharges and a rising sea-level. The water supply is endangered due to less rainfall in summertime, increasing salt water intrusion, and soil drop.

For that reason the Dutch national government started in 2009 the Deltaprogram, a national policy program with a strong legal and financial basis, aimed to study the effects of climate change on the water safety and fresh water supply and to develop measures for the long-term.

The Deltaprogram has a rather complicated program structure. There is one national Deltaprogram, with nine subprograms (six regional sub programs and three thematic programs), and each sub program is a cooperation of Ministries, provinces, water boards, municipalities and NGO's. The decision making is structured in an annual "Delta Program", which had to result in 2015 in a national Waterplan. In this plan five core decisions has to be made (the so called Delta decisions). The report as well as the Delta decisions are formulated by the subprograms, the national program, and all participating governments together.

This complex program structure is chosen to manage both the national connectedness and the local diversity of the water system. Water systems are essentially multi-level systems. Water issues in small polder areas are connected to water problems in neighboring polders, and the same holds true for water issues in river branches, lakes and basins. Solutions in one subsystem can have a negative effect on other subsystems and vice versa. Due to this complexity and connectedness, there is not one governance level which can act on its own, but involvement of governments from the local to international level is necessary. This multi-level governance cannot simply be characterized as either 'top-down' or 'bottom-up'. There is a much more dynamic and non-linear interplay between the different governance levels, in which realizing climate adaptation depends on the extent to which actions on various governance levels are synchronized (Cash et al. 2006; Mitleton-Kelly, 2003; Teisman & Edelenbos, 2011).

However, there is still limited knowledge about the dynamics of multi-level governance, the characteristics of synchronization and how synchronization can contribute to effective multi-level governance. For that reason we will explore in this paper both theoretically and

empirically how the dynamics of multi-level governance can be characterized, and how synchronization between different governance levels is realized.
This will be done by firstly a theoretical exploration about multi-level governance and synchronization between governance levels. In this exploration we characterize multi-level governance, and look how 'synchronization' happens in multilevel governance, how it is realized and which effects it sorts. This is further studied in a case analysis, in which we look when and how synchronization is achieved and what the effects are of synchronization. Based on this analysis we are able to reflect upon the usefulness of the concept of synchronization to analyze processes of multilevel governance.

In the next section we describe our theoretical framework. In the third section the research methods are explained, followed by the case description and analysis in the fourth section. The paper ends with our conclusions and questions for further research.

2. Theoretical framework

2.1 Research on multi-level governance

The last decennia, there is a growing attention to the challenge of multi-level governance. Besides other challenges like globalization and democratization, governance institutions has to deal with the challenge of realizing their policy goals in a multi-level setting (Pierre and Peters, 2000). This multi-level challenge is also addressed from a physical perspective; physical systems like water systems, ecological systems and infrastructural systems are multi-level. Governance of these systems has therefore to deal with multi-levelness (Adger et al. 2005; Blomquist, 2009; Eckerberg & Joas, 2004; Jones et al. 2008; Marshall, 2008). A different perspective on governance, in which the multi-level challenge also is addressed, is complexity theory. In this body of theories the main focus is on the complex characteristics of governance; governance processes are complex, not only because of the many processes and the many actors in these processes, but also because of the non-linear and self-organizing interactions between these processes and actors. From this perspective, multi-governance is a challenge of realizing policy goals in a nested governance structure, with dynamical and unpredictable interactions within and between the levels (Cilliers, 2001; Stacey, 1995; Teisman et al. 2009; Van Buuren & Gerrits, 2008)

Besides addressing the challenge of multi-level governance, also much research has been done to ways to deal with this challenge. There are for example many studies to the institutional design of multi-level governance, especially with regard to the European Union and the way governance if formed between the levels of the nation states and the European Union (Hooghe & Marks, 2001; Piattoni, 2009). Another approach, is to build the capacity of governance levels to deal with multi-levelness. By for instance more robust, flexible and adaptive governance, it is easier to deal with the multi-levelness of physical as well as the social systems (Gupta et al. 2010; Meadowcroft, 2002; Olsson et al. 2007). A more practical approach can be found in management studies. Management approaches like project, program and process management are examples of practical approaches which (more or less) try to deal with multi-level governance (Van Buuren et al. 2010; Ferns, 1991; Teisman et al. 2009; Warglien, 1995).

This is not a complete overview of the field, nevertheless it shows the growing attention to multi-level governance and the struggle to find ways to deal with governance in a multi-level setting. Although much research has been done, the question how multi-level governance processes in practice evolve and how coordination between more or less autonomous processes on various levels can be achieved is until now not answered satisfactory.

2.2 Characterizing multi-level governance

From a legal point of view, multilevel governance has to do with governmental actors with different jurisdictions. From an organizational perspective, multi-level governance has to with organizations which act on different scales. But from a governance perspective, multi-level governance has first and foremost to do with actors interacting in different constellations, who organize themselves on different levels, dependent upon the scope of the process they choose. Actors interact with each other because they are mutual dependent and thus have to cooperate to realize their own goals. This interaction can be seen as the core of governance processes.

From a complex systems perspective these interaction configurations can be depicted as subsystems within an overarching complex system. Such a system is nested: it is constituted (both vertically and horizontally) of many interrelated subsystems which are partially overlapping. Developments within one system have (unforeseen) consequences in other systems. Subsystems can be defined based upon the interaction patterns of actors and their boundary judgments with regard to the scale of the issue. This nested structure of a complex multilevel governance system with all kind of connections between actors in different

subsystems, is not a static configuration. Actors act and react upon each other. Sometimes the action of one actor has a large effect because of the interconnections and interdependencies, and sometimes there is hardly any effect because of negative feedback from other actors. For that reason, systems and subsystems evolve in a non-linear way (Cilliers, 2000; Duit & Galaz, 2008; Heylighen, 1998; 2006; Mitleton-Kelly, 2003; Simon, 1962; Young, 2006).

Within multi-level governance systems many interaction processes are running at the same time, and they deal with different issues which are defined at different scales. The relations between these processes at various levels are at the one hand hierarchical because higher levels possess the authority to influence the room to maneuver for lower levels. At the same time the relations are more network-like and based upon equality, although not horizontal. These multi-level governance systems are, because of the notion of non-linear dynamic, not a static entity, but are developing, shrinking, growing, in a non-linear way.

All together we can describe multi-level governance in three key characteristics: nestedness, levels which are both autonomous and dependent, and this configuration is in time dynamical in a non-linear way.

2.3 How to realize policy goals in a multi-level setting

As said, climate adaptation is many times a case of multi-level governance. Therefore, an important question is how realizing policy goals – in this case climate adaptation – is possible in a multi-level setting. The well-known notions of top-down and bottom-up governance have hardly an answer to this. Top-down processes are not effective because the ‘higher’ level does not have the legitimacy and knowledge to decide about and implement adaptation measures. In other words: there is no room for hierarchical steering. And also bottom-up processes have their limits, because the ‘lower’ levels do not have the necessary resources and the local interventions are difficult to become connected for successful upscaling. This shows that realizing policy goals in a multi-level setting presupposes a much more complicated interplay between governance levels, which cannot be interpret as top-down or bottom-up (Cash et al. 2006; Mitleton-Kelly, 2003). Governance is then not about organizing top-down or bottom-up processes, but about realizing connectivity between the different governance levels. The idea of connectivity is elaborated in theories about network governance. In these theories is described why the connection between actors is crucial to achieve policy goals. Only when through (managing) these connections common goals, knowledge, ideas, methods etc arise, is generating policy outcomes possible (Brass et al. 2004; Koppenjan & Klijn, 2004; Sabatier,

1988). A further elaboration has been made by Kingdon (1984). He looks at policy processes as streams of problems, solutions and politics. Generating outcomes is possible when these streams become connected, and a 'policy window' arises. The dynamic development of the streams describes Kingdon as a process of evolution. Similar thoughts can be found in the application of the concept of co-evolution in social sciences. The main idea is that each system evolves in time. However, the systems influence each other. In this way a mutual evolution appears, which is called co-evolution (Van den Bergh & Stagl, 2003; Gerrits, 2008; McKelvey, 1999; 2002; Porter, 2006; Teisman et al. 2009). Another perspective on connectivity and the way autonomous entities are related to each other, can be found in the concept of synchronization. Synchronization related to multi-level governance means that the actions of different governance levels occur together, and strengthen each other (Jaworski, 1996; Teisman & Edelenbos, 2011). It is interesting to see whether the concept of synchronization can help us to understand and influence the dynamics within multilevel governance systems.

2.4 Synchronization

The theoretical exploration of the concept of synchronization is started by Carl Jung (1973). From the discipline of psychology, he describes how actions occur together without a causal connection. When the observer experiences a meaningful connection between the actions, but without a causal explanation, Jung interprets this connection as synchronization (Hamaker-Zondag, 2000; Jung, 1973). Synchronization can be applied to management and governance, and in this application some basic elements of the insights of Jung are used. Synchronization is about the actions of autonomous entities which occur together (Jaworski, 1996). From these ideas, we can deduce some core elements of the concept of synchronization. Synchronization is about two or more entities, which have some degree of autonomy. Despite of this autonomy, actions of these entities occur at the same time (Jaworski, 1996; Teisman & Edelenbos, 2011).

With regard to multi-level governance, we can say that governance levels are autonomous entities, with their own dynamics. These entities evolve, based on the actions of the actors at the level. Synchronization emerges when these governance levels evolve at the same time, and this synchronization is meaningful to the multilevel process. With the term meaningful we mean – following the ideas of symbiotic coevolution and synergy – that the development of both entities is strengthened. Thus, we can define synchronization with regard to multi-

level governance as the simultaneous and mutual strengthening evolvement of (more or less) autonomous governance levels.

With this definition, synchronization is a temporal state of the multi-level system which can emerge. This leads to the question how synchronization emerges, and what the effect is of this synchronization on the outcomes of a multilevel governance system. This question is hardly studied. For that reason, we will use the case analysis to explore this. Based on the knowledge about multi-level governance, we can indicate four possible explanations of the emergence of synchronization:

- Actions of the level: because of choices made upon the various levels which impact upon other levels, synchronization occurs;
- Interactions between levels: synchronization results from interaction between governance levels;
- Events: because of internal or external events synchronization occurs;
- Chance: the occurrence of synchronization is not intended or organized, but results from coincidence.

2.5 Conceptual framework

The previous theoretical exploration of multi-level governance and synchronization can be summarized in a conceptual framework. The starting point is a multi-level setting of two or more autonomous governance levels. Each level evolves, both due to internal dynamics (self-organization) and external influences (coevolution). To be more specific about the development of governance levels, we use the familiar distinction between structures, content and processes (Koppenjan & Klijn, 2004).

By structure we mean the rules, organizational arrangements and procedures that structure interaction patterns on a certain governance level. By content we focus upon the question what is the objective and agenda of the governance process. Processes are closely related to structures, but with the important differences that structures are about the more formal rules, procedures and organizational structures, and processes is more about the way within these structures things are done. Processes are then about the way people behave and interact, their efforts to collaborate and strategies.

Firstly we will look when structures, content and processes evolve in a simultaneous and mutual strengthening way. The second step is to analyze the trigger for this synchronization.

Finally we will explore the effects of synchronization. This is summarized in the figure below (figure 1).

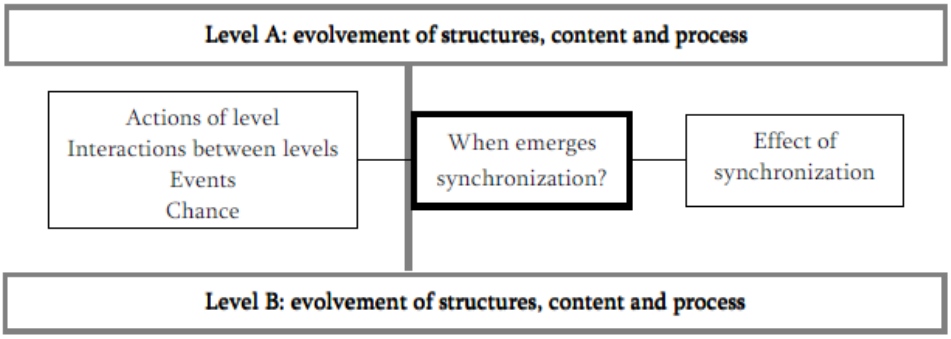

Figure 1 Theoretical framework

3. Methods

The case which has been studied is a nested case. We focus our analysis on the Deltadecision Rhine-Meuse Delta. As said before, this Deltadecision is an important deliverable of the national Deltaprogram and comprises the subprograms Rivers, Rotterdam Area, and Southwest Delta. To analyze the dynamics around this Deltadecision, we describe what happens during the last two years on the level of the national Deltaprogram, on the level of the Deltadecision and on the level of the three subprograms, where we focus on the subprogram Southwest Delta, because this subprogram is the most elaborated subprogram.

For our case description we used a combination of qualitative research methods. Firstly, participative research has been done from end 2009 until mid 2011. One of us is involved (as an employee) in the subprogram Southwest Delta. From this position it was possible to analyze the way this subprogram deals with the Deltadecision, and how the structures, content and processes on the three levels were organized. Secondly, an analysis of documents has been done. We analyzed formal documents and memos from all three levels, dealing with the issue of the Deltadecision, and also accounts and emails with regard to the Deltadecision. Besides the participation in the subprogram Southwest Delta, we observed five meetings: three meetings of the directors around the Deltadecision Rhine-Meuse Delta, and two meetings with all civil servants around this Deltadecision. Finally, nine interviews with key actors around the Deltadecision have been done, including the directors, secretaries and process managers of the three subprograms.

Based on the data we reconstructed the case. Thereafter we analyze the case in three steps. Firstly the moments of changes in structures, content and processes are indicated. Based on this, we could distinguish the moments when synchronization of desynchronization arise. Finally we analyze these moments, and looked how this (de)synchronization emerges, and what the effect is of the (de)synchronization.

4. Case analysis

4.1 Rhine-Meuse Delta; case description

In 2009, the national Deltaprogram started to explore the effects of climate change on the water safety and fresh water supply. This program was started as the administrative follow up of a governmental commission which concluded a year earlier, that climate change could have major effects in The Netherlands. From the nine subprograms within the national Deltaprogram, there are three in the Rhine-Meuse Delta: the Rivers (rivers Rhine and Meuse), the Rotterdam Area, and the Southwest Delta (the delta area between Rotterdam and Antwerp) (see figure 2). After a few months, in January 2010, the idea arose that a limited number of crucial decisions is necessary to make decisions-making possible in this complicated multi-level program. These decisions are named 'Deltadecisions', and one of the decisions is the 'Deltadecision Rotterdam Area', which is a decision about the safety of the Rotterdam area. In the next months, the subprogram Southwest Delta started a lobby in the Deltaprogram to change this Deltadecision. The reason to start this lobby is that water management solutions in the Rotterdam Area have major consequences for the Southwest Delta. When for example a new storm surge barrier is constructed in the Rotterdam Area, the dikes in the Southwest Delta had to be raised because of additional storm water discharge. The subprogram Southwest Delta is therefore lobbying to realize an integral decision-making process about flood risk safety in the whole Rhine-Meuse Delta. Nevertheless, the process

Figure 2 Rhine-Meuse Delta (based on Deltaprogram, 2011 and Program Southwest Delta, 2011)

evolves relatively stable, and a change in the Deltadecision is only achieved in May 2010. At that moment, the lobby within the Deltaprogram and the subprograms has effect; more and more people are convinced of the necessity of an integral decision-making process, and consequently it was possible to rename and reframe the Deltadecision as the 'Deltadecision Rhine-Meuse Delta'.

In the same period, in May 2010, the first document had to be delivered by the subprograms to the national Deltaprogram. In this document the subprograms have to present a plan in which is described how the Deltadecisions and the national Waterplan in 2015 will be prepared. All subprograms make their document with hardly any cooperation with other subprograms or the national program. Only a few weeks after the presentations of the plans, the directors of all nine subprograms discussed about the Deltadecisions, because it became clear that in none of the written plans the Deltadecisions are even mentioned. In other words, nobody feels responsibility for preparing the Deltadecision. Therefore the directors decided that each Deltadecision will be prepared by three subprograms. The Deltadecision Rhine-Meuse Delta will be prepared by the subprograms Rivers, Rotterdam Area and Southwest Delta (figure 3). Although this decision is taken, only some informal cooperation between the three directors started, but a broader cooperation does not emerge.

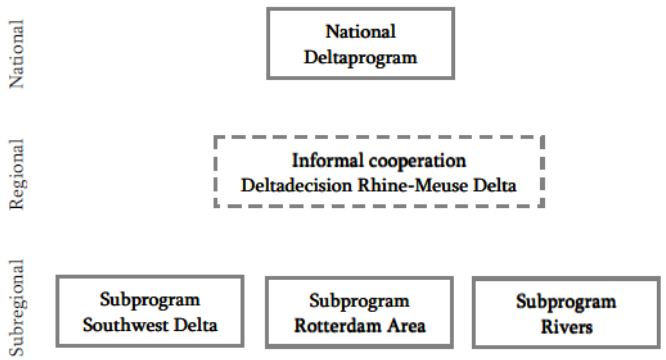

Figure 3 Multi-level governance in the Rhine-Meuse Delta

In the period November 2010 till May 2011 the subprograms were making their next product: the analysis of the problems which could arise because of climate change. In this process the focus is mainly on the own subprogram, there is hardly any cooperation between the three subprograms. This is partly because of the amount of information and the strict deadline. Only in the studies to the water safety in the Rhine-Meuse Delta there were some operational appointments between the subprograms about cooperation in contract research and using the same data in the calculations. However, these appointments were mainly in a coordinating and not in a cooperating way. Between the three directors however, the cooperation increases. They explore together the connectedness of the water systems in the three subprograms and develop an approach to come to an informal cooperation between the three subprograms. This approach is to organize two conferences in which the knowledge about the system

connectedness is shared, enriched and internalized by the civil servants and the governors of the subprograms, and in which appointments about the further cooperation can be made. To prepare these conferences, five small teams were set up of civil servants from the three subprograms. Another important decision of the three directors had to do with adopting the national calendar as guide for their own planning. Until then, there was for each document which had to be delivered one crucial deadline. The directors want more national coordination in the preparation of and decision-making about these documents, this by composing a national calendar. This is interesting because at the same time, in April 2011, a governance evaluation of the Deltaprogram was published in which was recommended to give more steering with use of a national planning, and to make de Deltadecisions leading in this planning. The national Deltaprogram follows these recommendations.

In May the teams started to prepare the conferences. They develop the first joint products of the three subprograms: an analysis of the consequences of climate change for the Rhine-Meuse Delta, potential solutions for the whole Delta, and a plan for the process and timing of the Deltadecision Rhine-Meuse Delta. In September 2011 the first conference was hold. During the conference, the knowledge about the coherence of the water system Rhine-Meuse Delta was confirmed and a joint vision on the process of the Deltadecision arose. To prevent further institutionalization, and to confirm the informal character of the cooperation, the teams were terminated, and only the necessary preparation for the next conference was organized. At this moment the preparation for the next conference is in progress.

In the figure below (figure 4), the case description is summarized in a timeline. In this figure also a different levels are represented: regional (the subprograms), supra-regional (the Deltadecision Rhine-Meuse Delta), and national.

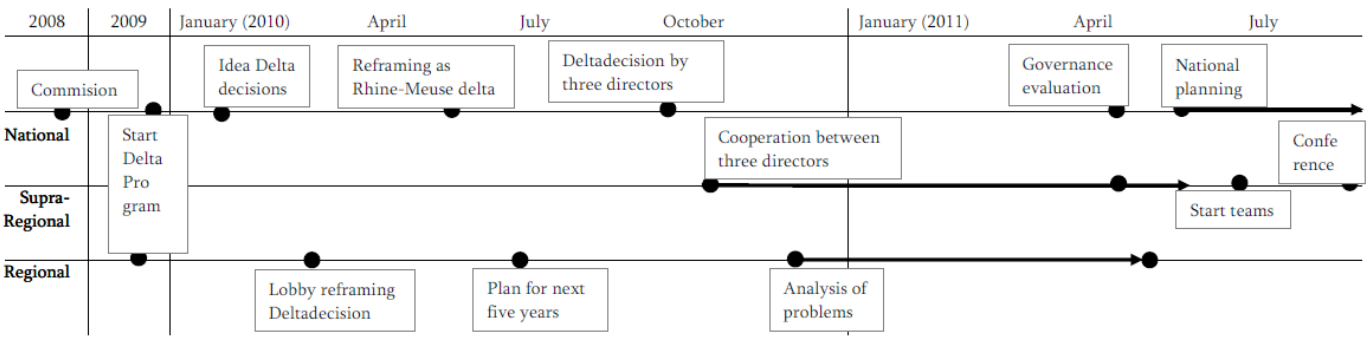

Figure 4 Timeline and summary of case description

4.2 Synchronization of structures, content and processes

The first step in the analysis is to look at the evolvement of structures, content and processes around the Deltadecisions Rhine-Meuse Delta. This will be followed by an analysis of the moments of synchronization and the moments when synchronization is broken (we call this ‘desynchronization’).

Synchronization of structures

Firstly, we will look at the structures around the Deltadecisions Rhine-Meuse Delta. In January 2010 a first relevant development with regard to structures can be found; at that moment the national Deltaprogram consider that national Deltadecisions are necessary to make decision-making possible. Herewith a structure arises in which the input of the subprograms is ordered with use of the Deltadecisions. Until September 2010 this structure is stable. In September the structure changes at national level, because de directors of the subprograms are made responsible for the Deltadecisions. In a very short time, this is translated to the supra-regional level by the start of an informal cooperation between the three directors for the Deltadecision Rhine-Meuse Delta. In April 2011 the structure at the national as well as the supra-regional level evolves. At the national level was decided to give more steering to the process, by use of a strict national planning and by using the Deltadecisions as ordering principle for the next years. Simultaneous, at the supra-regional level is also decided to follow for the Deltadecisions the national planning. Besides, at the supra-regional level small teams started to prepare the first products for the Rhine-Meuse Delta. Only a few months later, in September, the teams are discontinued.

The evolvement of structures is summarized below (figure 5). Important notion for reading these figures is that the moments of synchronization are hard to imagine in a straightforward way. We have chosen to indicate synchronization by a line. It is important to recognize that the synchronization arise at the moment where the line ‘ends’. In case of desynchronization, we have used a dotted line.

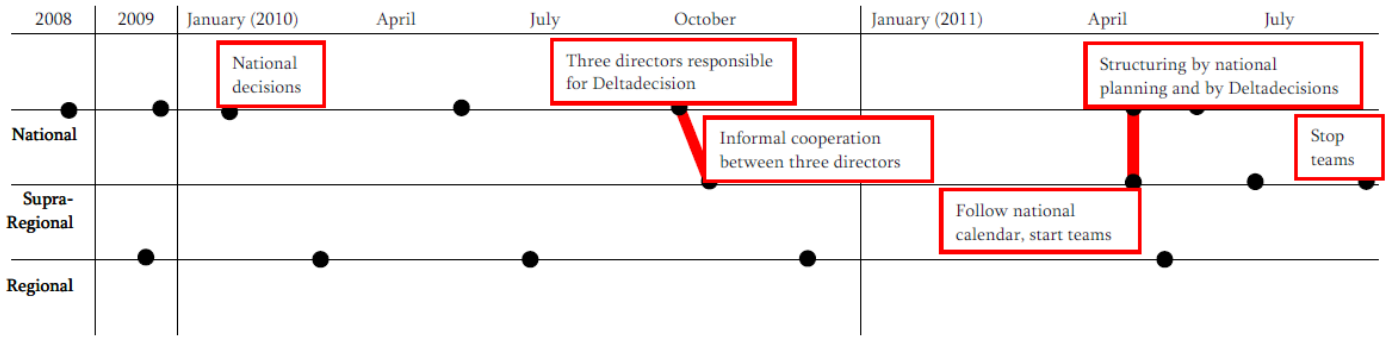

Figure 5 Synchronization of structures

At two times, we see that synchronization emerges. Firstly synchronization arises when the change at the national level to make for each Deltadecision three directors responsible, is translated in a very short time at the regional level. In the interactions between the subprograms and national level there was longer time discussion about how to organize the Deltadecisions. Because of this, a foundation at the supra-regional level was already laid, and a very soon synchronization with the national change of structures was possible. Thus because of the interactions between the level, synchronization was possible. The result of this synchronization is that the structure around the Deltadecision Rhine-Meuse Delta could be established very soon, this in contrary to some other Deltadecisions.

In April 2011, a second moment of synchronization can be recognized. At two levels we see at the same time a comparable movement. At both levels there is an increasing recognition of the changed political situation in which the focus is on a lean government. This leads to a discussion within the levels how this relates to the complex organization of the Deltaprogram. At the national level the choice is made to steer stronger on a national calendar and on the Deltadecisions. At the supra-regional level the discussions lead to the same outcome by giving the Deltadecisions a structuring position in all documents and plans and by taking the national planning as a guiding principle. Thus an event – the changing political situation – leads to synchronization. This moment of synchronization resulted in a further establishment of the structures around the Deltadecision Rhine-Meuse Delta, and also in an increasing confidence at the national level in the way the Deltadecision Rhine-Meuse Delta is organized.

Synchronization of content

The content of the Deltadecision was started to be developed in January 2010, when five crucial national decisions with regard to the delta were distinguished. One of the decisions for

which a national consideration is deemed necessary, is the safety of the Rotterdam Area. This national idea was contradictory to the regional idea that the Rhine-Meuse Delta is one water system, in which solutions for the one region leads to problems in another region and consequently requires an integral consideration. Due to a successful regional lobby to reconsider the scope of this delta decision a few months later this Deltadecision is renamed and reframed as the Deltadecision Rhine-Meuse Delta. Until the end of 2010 there are no other changes in the content. At the end of 2010 until mid 2011, there is in the subprograms an increasing focus on the own region. Information and knowledge is gathered, but not in mutual adjustment between the three delta subprograms within the Rhine Meuse Delta area. In the same period, there are also changes in the content at the supra-regional level. At that level a joint exploration of problems and solutions in the Rhine-Meuse Delta was done and a joint definition of the problem and the method to explore potential solutions was developed.
The changes in the content are summarized in figure 6.

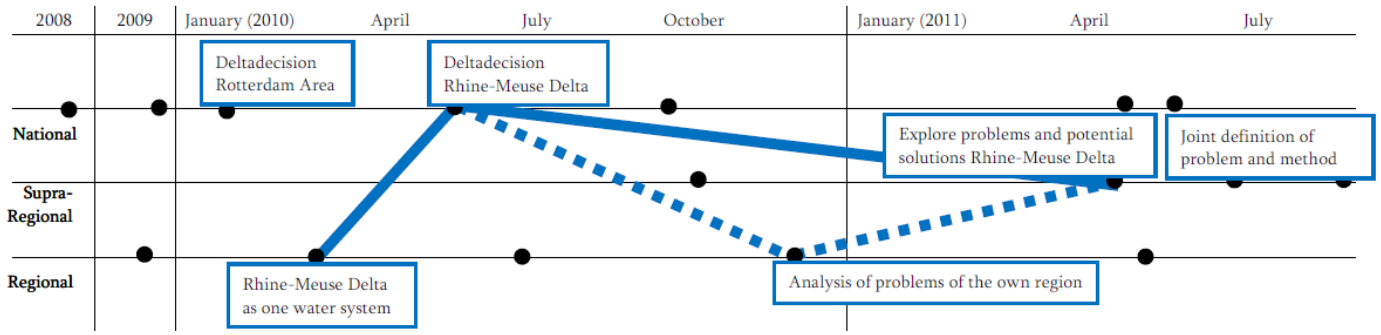

Figure 6 Synchronization of content

When we look at the changes in the content, we can distinguish moments of synchronization as well as moments of desynchronization. Synchronization arises in 2010, when the scoping of the Deltadecision Rhine-Meuse Delta is synchronized between the national and regional level. This synchronization results from an intensive lobby from the subprogram to the national Deltaprogram. Thus the interaction between the levels – this time by a lobby – leads to synchronization. The synchronization has also effects; the initially diverging perspectives on the Rhine-Meuse Delta are now converging to a joint perspective. Because of this joint image, the activities of the three levels contribute to the Deltadicision without intensive cooperation. In April 2011, synchronization is also realized between the national and supra-regional level, when at the level of the Rhine-Meuse Delta the problems and potential

solutions were explored. Because of the interaction between especially the national and supra-regional level, a joint focus on the Rhine-Meuse Delta as holistic water system arose, and synchronization in the content became possible. Similar to the previous moment of synchronization, this synchronization also results in a joint image of the Deltadecision.
The realized synchronization was broken when at the end of 2010 the focus at the regional level changed to the own region and less to the Rhine-Meuse Delta. As said earlier, this was mainly because of the strict deadlines the subprograms have to handle. The change of focus can be seen as an attempt to reduce complexity for the involved civil servants. In other words, desynchronization results from the insufficient resources to combine both levels. It is interesting to see that in the same period when synchronization between the national and supra-regional level was reached, desynchronization with the regional level arose.

Synchronization of processes

Finally, we will analyze the development of the processes on the various levels. In 2008 the process to come to a national Waterplan and to Deltadecisions within this plan, is started as a process of cooperation between national and regional governmental agencies. A year later this is further specified as a process in which national and regional agencies cooperate in subprograms, and between the subprograms there is mutual coordination. This is not only a specification, but the process evolves from cooperation between agencies to coordination between cooperating agencies. A few months later, a process of informal cooperation started at theregional level. At the end of 2010 some developments follow each other. Firstly, in September, at the national level an additional interaction process is initiated, by starting an informal cooperation around the Deltadecision. This is followed soon by a similar evolvement at the supra-regional level. In December 2010 we see at the regional level a contradictory development, the long time followed informal cooperation is changed in a process of more formal coordination. After a relatively stable half year, some changes follow up each other. In May 2011 from the national level a more structuring and steering approach is chosen. At the supra-regional level we can witness a slowly formalization and institutionalization of the process. However, this is stopped when a few months later the teams are discontinued, and the process is going back to an informal way of cooperating.
In the figure below the changes in the process are sketched (figure 7).

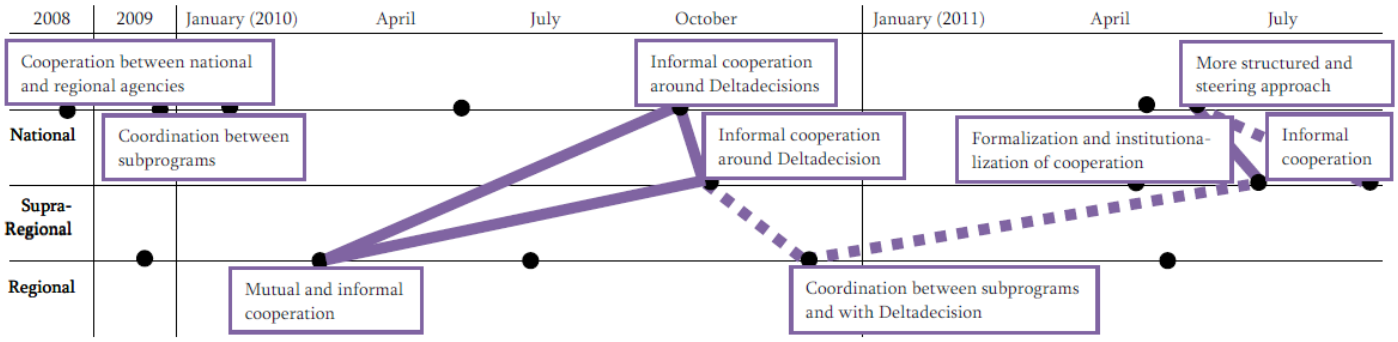

Figure 7 Synchronization of processes

A first moment of synchronization is in October 2010, when besides the regional level also at the national and supra-regional level the process is changed to a process of informal cooperation. There is thus synchronization between all three levels, and the result of this synchronization is that from now the supra-regional level of the Deltadecision is seriously organized. This synchronization comes from the intensive interaction between the levels about how to organize the Deltaprogram and the Deltadecision. Another moment of synchronization is in mid 2011, between the more steering approach at the national level and the formalization at the supra-regional level. This synchronicity looks like chance; it comes not from action at the own level or interactions between the levels, but a natural organizational evolvement occurred together with the more steering approach which is initiated by the governance evaluation and the changing political situation. However, this synchronicity has hardly any effect on the process.

However, there are also moments of desynchronization. The synchronization between the three levels is broken at the end of 2010, when at the regional level the processes evolve from cooperation to coordination. Reason for this change is a stronger focus in the processes at the own level. Also the synchronization by chance in mid 2011 is broken, when in September the supra-regional processes are going back to a more informal cooperation. With this change the supra-regional processes come closer, but still not synchronized, to the regional processes. In other words, the attempt to synchronization with the one level, leads to desynchronization with another level.

4.3 Synchronization and multi-level governance

The final step is to summarize the analysis above, and to look what we can learn about synchronization as a way to realize policy goals in a multi-level setting. The analysis is summarized in the figure below, in which all moments of synchronization and desynchronization are sketched (figure 8)

In the next sections we will, based on the analysis, reflect on the emergence and effects of synchronization.

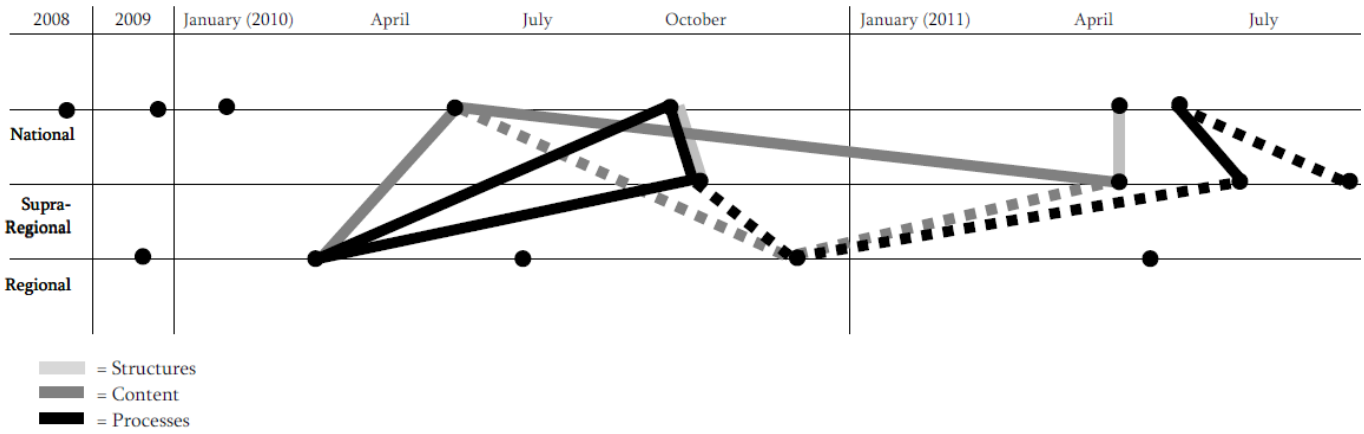

Figure 8 Summary of the moments of synchronization and desynchronization

The emergence and effects of synchronization

For each moment of synchronization and desynchronization we have tried to identify the factors which explain the occurrence of it. Therefore a distinction is made between actions within one of the levels, interactions between the levels, external events, and chance. In the table below a summary of the case analysis is given about how (de)synchronization is reached.

	Synchronization				**Desynchronization**			
	Actions	Interactions	Events	Chance	Actions	Interactions	Events	Chance
Structures	-	1	1	-	-	-	-	-
Content	-	2	-	-	1	1	-	-
Processes	-	3	-	1	2	1	-	-

Table 1 Causes of (de)synchronization

When we look at the moments of synchronization, we see that synchronization is mainly reached by the interactions between the levels. From the eight moments of synchronization,

six of them results from the interactions. The actions within the levels, on the contrary, do not lead to synchronization. This is interesting because it shows that, although synchronization is about (more or less) autonomous governance levels, especially the interactions between the levels are important to synchronization. Besides the interactions, synchronization comes also from events and chance. This is important to notice, because it shows that synchronization is not a situation which can be managed and controlled.

The way synchronization is broken, comes firstly from the actions within the levels. The case shows the choices which are made within a level could lead to desynchronization, and therewith have their impact on other levels. Besides that, we see in the case that the synchronization with one level can lead very directly to desynchronization with another level. In other words, the interactions between the levels also lead to desynchronization. This raises however important questions: what kind of interactions between levels lead to synchronization, lead all kind of interactions between levels to synchronization, or is it only a specific kind of interactions? And results desynchronization from the same kind of interactions? This requires further research.

In the case analysis we have also noticed the effects of the synchronization. In the table below, this is summarized (table 2).

	Synchronization
Structures	- Possibility to establish a structure for the Deltadecision - Further establishment of the structure, and increasing confidence between the levels
Content	- Converging perspectives, and contribution of the activities of the levels to the Deltadecision - Joint perspective
Processes	- Organization of the Deltadecision at the supra-regional level (as result of synchronization between the three levels) - Hardly any effect

Table 2 Effects of the moments of synchronization

Based on this overview, we can distinguish some important effects of synchronization. Firstly, because of synchronization new possibilities arise. For example, because of the synchronization of processes in October 2010, it was possible to organize and prepare the Deltadecision Rhine-Meuse Delta. This was a year before, despite of divers attempts, not possible. Around the synchronization of structures we see also that possibilities arise; because of the synchronization it was possible to establish step by step a structure for the

Deltadecision Rhine-Meuse Delta. Another effect of the synchronization is the togetherness which arises at some moments. Examples are the joint perspectives which arise from the synchronization of the content, and the increasing confidence between the levels. Finally, because of the synchronization it was possible that the levels contribute to the Deltadecision Rhine-Meuse Delta without intensive cooperation. For example, in May 2010 synchronization of the content of the Deltadecision arose, which resulted in a joint image of the Deltadecision as a decision about the whole water system of the Rhine-Meuse Delta. Because of this synchronization, the activities of all levels were done from this idea, and consequently the results of these activities contribute to the joint process around the Deltadecision. It is however hard to generalize these effects. Firstly, because we also see moments of synchronization which have hardly any effect, and secondly because of the limited time we have studied this case. Nevertheless, these possible effects give us a good starting point for further research.

5. Conclusions

In the theoretical framework we have defined synchronization as the simultaneous and mutual strengthening evolvement of autonomous governance levels. Based on the analysis we will reflect on the three core elements of this definition; timing, evolvement and autonomous levels.

Firstly, the *timing*. When we look at the moments of synchronization, we see that sometimes the mutual strengthening evolvements are simultaneous, but most of the time the evolvements at the levels are very meaningful to each other without being exactly at the same time. Synchronization is thus not necessarily about simultaneousness, but about the connection between the evolvements which is meaningful, whether it is simultaneous or successive. In other words: the focus of the concept of synchronization on simultaneous occurrence is too restrictive to understand mutual adjustments between governance levels.

In the analysis of the *evolvements* we have distinguished between elements of structure, content and process. With regard to these various components of governance levels it is interesting to see that synchronization in structures only happens two times, in content two moments of synchronization and two of desynchronization can be witnessed, and synchronization in processes happens four times and desynchronization three times. It thus seems to be that structures are the most stable and inert in reaching and maintain synchronization, processes are the most dynamical and fluid in reaching synchronization, and

content is in the mid. It needs more research and empirical analysis, to study this phenomenon further.

The last core element of the used definition of synchronization is the *autonomy of governance levels*. The analysis shows that the governance levels indeed function as entities with their own (self-organizing) dynamics. From this perspective the entities are autonomous. But at the same time they depend on each other for realizing their policy goals. Synchronization emerges not top-down or bottom-up, but crosses the levels. This corresponds with the nested character of multi-level governance. We can see both elements of hierarchy (for instance decisions of the Delta Commissioner) and bottom-up dynamics in our case, so the notion of autonomy of the various governance levels has to be nuanced.

Finally, there is one important notion from the case analysis related to the concept of synchronization. In much literature about synchronization a situation of synchronicity is the basis and the ultimate goal. In case of multi-level governance some realism is necessary. The case analysis shows that absence of synchronicity seems to be 'normal'. Governance processes on the various levels evolve in line with the own ways of doing, ambitions and procedures, which are focused upon their own audience and stakeholders. However, moments of synchronization are helpful and necessary to realize a consistent development between the various levels. The goal of (enduring) synchronicity seems not to be realistic, although there is still the aim of (moments of) synchronization. For that reason, it is more useful to speak about synchronization as a multilevel governance challenge, than about reaching synchronicity.

We have seen that the concept of synchronization is useful to describe the moments at which multilevel governance processes become connected. However, our case study also reveals that the concept have to be broadened to do justice to the complexity of multilevel governance. Further research is necessary to specify processes of synchronization, the way it emerges and its consequences, and especially which strategies are available to realize synchronization in a both legitimate and effective way in order to realize decisive and supported adaptation strategies.

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