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Getting caught up in the game: managing non-formal dynamics in the remediation of contaminated sediments in Oslo harbor

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This study aims at describing, analyzing and evaluating the relation between management styles and process dynamics of a complex planning process confronted with unexpected dynamics. The development of an aquatic disposal site for dredged contaminated sediments in Oslo was managed by a project management style focused on timely and cost-effective implementation. Coupling the remediation project with another infrastructural project and the actual construction of the site led to unexpected dynamics in terms of resistance and controversy. Project management had difficulties in adjusting its style accordingly, resulting in even more delay and resistance. Managing complex planning projects requires a style suitable to the characteristics of the project and the capability of adjusting it to changing circumstances. The paper concludes with some explanations why it is difficult to change management styles in complex planning and implementation processes and complexity-embracing approaches to deal with this.

Keywords: management styles; complex decision making; contaminated sediments; non-formal dynamics; infrastructure projects

1. Introduction

Remediation of contaminated sediments in densely populated harbor areas can be acknowledged as a complex policy problem. This complexity is caused by societal debate, scientific discussion and political struggle about the definition of the policy problem and (the impacts of) its potential solution. Therefore, complex policy problems are not objectively given, but highly subjective social constructs (cf. Hisschemöller 1993). They are constructed along diverging interests, perceptions, knowledge and preferences of network actors involved.

Complex or “wicked” issues are characterized by the involvement of many, interdependent actors who try to influence both the problem definition and the selected solution by mobilizing their own resources (knowledge, support, media attention and so on). To analyze (the context of) complex policy or planning problems, many authors postulate a governance network perspective to be helpful (Torfing 2005; Klijn and

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Koppenjan 2000). It sheds light on the perceptions of involved actors, the way they interact and the manner in which complex issues are dealt with.

An important element of the governance network approach is related to managing complex networks in such a way that the interaction of interdependent actors also results in legitimate and effective policy answers (Klijn and Koppenjan 2000). In the literature we observe growing attention for the impact of different management styles on the evolution of governance processes and their outcomes (Edelenbos, Klijn, and Kort 2009; Edelenbos, Klijn, and van Buuren 2013).

However, until recently less is known about the relation between unexpected dynamics in complex planning processes and the management style used. We analyze this relation through an in-depth case study of a large sediment remediation project that has been executed in Oslo harbor, Norway. In the remediation project, an aquatic disposal site (hereafter ADS) was established for the disposal of contaminated sediments dredged from the inner harbor. However, the planning and construction of the ADS received a lot of negative attention from society, including actions against the dredging itself, large media coverage and public discussion about the project. Moreover, the consequences of the societal turbulence were “multiplied” by the coupling made between the ADS project and another complex project, the reconstruction of the E18 motorway. From a project management perspective, this connection was deliberately made to capitalize synergy and reduce costs in the implementation phase. However, the connection resulted in unexpected complexity because societal resistance and the delays in the ADS project could also result in serious delays in the E18 project.

In this paper, we answer the question how we can evaluate the effectiveness of the management style used in the planning and implementation process of the ADS. This process was characterized by unexpected dynamics, caused by the connection to another complex project and the societal turbulence that arose during the actual construction works. The effectiveness is evaluated by focusing on two crucial indicators of governance processes: progress (in terms of disturbances and delays) and support (legitimacy and stakeholder satisfaction). This research question is answered by characterizing the playing field of the ADS project from a theoretical perspective. Through case study research, we retraced and reconstructed the course of events in the planning and implementation process, with the objective to identify the decision-making rounds and the involvement of various actors in the process. Lastly, we analyze and evaluate the applied management style, with regard to how the entire process evolved over time.

2. Characterizing the playing field: decision making in policy networks as policy games

It is broadly accepted that we live in a network society (Castells 2000). As a consequence, policy and decision making takes place in networks that reflect the changed relationship between state and society (Börzel 1997; Mayntz 1993). There is no longer a stringent division between the two and policies are, in fact, constructed through processes that involve a plurality of both public and private actors. In this respect, the concept of policy networks signals a real change in the structure of governance (cf. Mayntz 1993).

Klijn and Teisman’s definition of policy networks helps us come to grips with the specific dynamics within policy networks as “changing patterns of relations between interdependent actors that group themselves around policy problems or clusters of

resources and that are shaped, maintained and changed by a series of decision-making games” (Klijn and Teisman 1992, 32–51). These dynamics are characterized by the metaphor of “policy games.” Klijn and Koppenjan (2000, 16) characterize policy games as a “series of interactions between actors aimed at influencing problem definitions, solutions and methods to be applied.” Thus, policy games emerge when actors realize they need other actors for the attainment of their objectives.

2.1. Analyzing policy games: rounds of decision making

If policy is the result of decision making, and decision making is a series of decisions (Teisman 1992, 120), then it is obvious that these decisions are a basis for structuring decision making through the identification of so-called rounds of decision making. Each round is closed off by a decision, after which a new round of decision making may unfold. There are thus several rounds (cf. Van Gils and Klijn 2007) in which the result of the policy process – a decision – is shaped, changed, reviewed and agreed on. Within these rounds, complex interaction patterns emerge in which actors try to clarify the problematic situation they are in and negotiate how to resolve the situation (Teisman and van Buuren 2012). For complex policy problems, this process is not without deadlocks and conflicts, e.g., arising from the intermediary uncooperative stages in the policy gaming process.

2.2. Formal and non-formal dynamics in complex decision-making processes

Governance processes are highly dynamic and only temporarily stable (Teisman, Westerveld, and Hertogh 2009). We can distinguish between formal and non-formal dynamics in governance processes. The formal dynamics represent the sequence of activities that evolve from formal procedures, constituted by legislation and administrative requirements and guided through the legally prescribed activities undertaken by government agencies. These institutionalized procedures structure the selection and involvement of actors by giving them certain roles in the decision-making process. The non-formal process dynamics represent the sequence of activities that evolve from the response, both reactive and proactive, by actors who are not *a priori* selected and involved in the formal decision-making process. These actors use different strategies and resources to enter the arena and to influence the formal dynamics of decision making, by drawing attention to their interests and concerns and by providing alternative knowledge and expertise. By doing so, they spark dynamics that are not grounded in the formal legislative requirements of the planning or implementation process and are therefore referred to as non-formal. Basically, in our line of reasoning here, non-formal dynamics¹ refers to “all dynamics that are not guided through the requirements of formal decision-making procedures.”

Unexpected, erratic dynamics can have different sources. Because governance processes are always nested and connected to other processes, dynamics in “neighboring action systems” can have huge and unforeseen impacts upon a governance process (Teisman, Westerveld, and Hertogh 2009). The same holds true for small events, events which get much impact due to the positive feedback they generate, and become change events which substantially change the course of events in a governance process (Van Gils, Gerrits, and Teisman 2009).

Together, formal and non-formal dynamics constitute the course of events in the decision-making process. Often, decision making is envisaged as a rational, predictable

Table 1. Typology of process dynamics in the planning and implementation stage of decision making.

Typology of process dynamics in the planning and implementation stage of decision making		
Decision-making stage →	Planning stage	Implementation stage
Process dynamics ↓		
Formal process dynamics	Grounded in: Formal power Legislation and administrative procedures Expert knowledge; science based	Grounded in: Detailed specifics on technical aspects Project management as management style, with emphasis on time and budget management
Decision-making strategy	Formal–technical strategy	
Non-formal process dynamics	Grounded in: Public opinion Societal acceptance and support Local knowledge; experience based	Grounded in: Alternative solutions and additional requirements Process management as management style, with emphasis on management of expectations and interests
Decision-making strategy	Non-formal–societal strategy	

and controllable effort. It is aimed at achieving known objectives, within legislative boundaries, based on expert knowledge and supported by available resources. However, in reality, decision making is not a clear cut process. Instead, irrationality, non-transparency and struggle for resources seem to more appropriately characterize the process of reaching decisions. Stakeholders develop their own strategies and initiatives (unsolicited policy proposals). They mobilize media to get attention for their own ambitions. They will play what we suggest to refer to as the “non-formal – societal game.” This game strategy is fueled by public opinion and broader societal interests and grounded in local experience and knowledge. Societal actors will obstruct formal decision making if their interests and knowledge are neglected. The interferences between the formal and non-formal process dynamics cause a change in events which are important to understand non-linear dynamics that characterize complex planning processes (Van Gils, Gerrits, and Teisman 2009; Teisman, Westerveld, and Hertogh 2009).

Inspired by De Bruijn, Ten Heuvelhof, and in 't Veld (1998), we have brought both types of process dynamics together with the key stages in decision making outlined in Table 1:

Table 1 indicates that formal planning and implementation processes of complex infrastructure projects are still (too) often grounded in a combination of formal authority and expert knowledge. This approach leads to the unjustified assumption that “things will go as planned,” ignoring the fact that the complexity of the project itself and its impact on the surrounding environment are likely to yield unexpected events. The management style that relies on formal authority and expert knowledge is (too) often incapable of

productively dealing with these unexpected events, sparked by spontaneous media attention, opposing opinions and alternative knowledge sources.

2.3. *Complex decision making and the impact of different management styles*

Managing complex projects is about dealing with complexity and uncertainty (Edelenbos, Klijn, and van Buuren 2013; Duit and Galaz 2008). The management style of the project team and the project manager are crucial for understanding whether a project realizes its goals. Earlier research has shown that a more complexity-sensitive management style is necessary in contexts characterized by substantial dynamics, a high variety of stakes, and strong interconnectedness between issues and interests (van Meerkerk, van Buuren and Edelenbos 2013). A less complexity-sensitive management style fits better in a context of projects characterized by a stable environment, few interests at stake and isolated issues. Other contributions to this research field define these management styles as project and process management, or complexity-reducing versus complexity-embracing approaches (Edelenbos, Klijn, and Kort 2009). An important condition, for determining which management style is most appropriate, is related to the boundary judgments made by key actors (van Meerkerk, van Buuren, and Edelenbos 2013). Wide or inclusive boundary judgments give room for a more adaptive, complexity-sensitive management style, while narrow and closed judgments result in a more focused and static management style.

The effectiveness of these different management styles is related to the problem-context in which they are applied. A complexity-reducing approach focuses on decomposing issues and solving the various component elements in isolation. Such a style is useful when there is much stability and a governance process runs smoothly (Edelenbos, Klijn, and Kort 2009). Project managers can focus on realizing their predefined goals within fixed time and budget norms. They can focus on managing formal dynamics in terms of following the procedural required steps. In such a context, it is important to protect a project from outside interference. A complexity-reducing approach can therefore be effective when issues are not very controversial and when the context is stable and predictable. A complexity-sensitive approach is more suitable in a context characterized by high uncertainty, controversy and unpredictable dynamics. In such a context, managers have to invest time and resources in realizing consensus, involving stakeholders and adapting to

Table 2. Conceptualizing project management and process management styles.

	Project management	Process management
Main focus	A well-thought-out substantive solution to the problem	Involvement of stakeholders and their interests
Dealing with dynamics	Through decisiveness and control	Through resilience, responsiveness and being open to other options
	Changing circumstances must not affect the planned course of action	The initiative must be and remain open and attractive for actors.
	Focus on separating the process from the environment, in order to stay in control	Focusing on interaction with the environment to realize consensus and enrichment
Context	Fits in a stable, predictable environment without conflicting demands	Fits in an unstable, dynamic environment with much controversy

relevant developments within the project context. Such an approach is much more oriented on dealing with the non-formal dynamics which can be not forecasted.

Due to this observed relation between management style and context, De Bruijn, Ten Heuvelhof and in 't Veld (1998) argue that a project management approach fails in complex decision-making processes, because such a goal-oriented management style is insufficiently able to deal with many conflicting interests, unexpected interferences, and changing conditions. In Table 2, we conceptualize both management styles (based on Edelenbos, Klijn, and Kort 2009).

2.4. Non-formal dynamics due to deliberate couplings

An underestimated element in the study of complex decision-making processes is the impact couplings can have on the dynamic evolution of such a process. Within the literature on complex decision making, the managerial capacity to connect issues and agendas to each other is frequently emphasized as an element of effective network management (Edelenbos, Klijn, and van Buuren 2013; Edelenbos, Van Meerkerk, and Klijn 2013; Duit and Galaz 2008). Couplings are an indispensable strategy to gain access to scarce resources (legitimacy, organizational capacities, money, knowledge) and thus to enhance progress and support. Network managers who are able to connect their initiative to others which can bring their initiative further are normally valued as competent. However, less is known about situations in which these couplings have opposite results. Due to unforeseeable feedback mechanisms and increased complexity, couplings can easily result in undesirable consequences, including increased resistance, time delays and loss of legitimacy.

In sum, in this paper we evaluate the effectiveness of the management style used in dealing with the non-formal dynamics of a complex planning process. In different rounds of decision making (which were highly different in terms of complexity: resistance, controversy and unexpected events), we unravel how the deliberate choices of the project management influenced the progress of the process (in terms of speed, delays et cetera) and the legitimacy of the ultimate solution (in terms of political and societal support, stakeholder satisfaction and absence of resistance).

3. Methodology and data collection

The data collection methods applied in this study were aimed at retracing and reconstructing the decision-making process in the ADS project. The overall methodology used is case study research. For selecting our case study we used a purposive selection strategy: to investigate the relation between management styles and process dynamics we need a rather extreme case in which this phenomenon can be analyzed in detail (Patton, 1990). The Oslo harbor case is such a case because, at the time, it was the largest and most complex sediment remediation project in Norway. Unexpected dynamics in its planning and implementation stages may serve as typical challenges for the management to deal with, e.g., in future sediment remediation projects.

Hall (2003, 93) indicates that “systemic process analysis examines the processes unfolding in the cases at hand, as well as the outcomes in those cases.” He argues that case studies enable researchers to make in-depth assessments of complex causal processes through richer sets of observations, e.g., based on archival and field work. In this study, the following causal line of reasoning is used: the formal planning process and actual implementation of the ADS and the coupling of this project to another complex infrastructural project leads to unexpected dynamics – societal turbulence and increased



Figure 1. Subsequent implementation of data collection methods.

complexity due to mutual interdependency – which may have consequences for the management style that is implemented.

According to Yin (2003, 97), triangulation is needed when collecting “multiple sources of evidence” because it enables a researcher to address a broader variety of cultural-historical, attitudinal and behavioral aspects of the object of study. Additionally, an important advantage of triangulation is “the development of converging lines of inquiry” (Yin, 2003, 98) that will support, legitimize, and make a reasonable case for the findings or conclusions because they are rooted in several sources of information. We have operationalized the triangulation of data collection through the consecutive implementation of three methods. First, an extended document analysis was conducted (see figure 1 below). Second, in-depth semi-structured interviews with 23 key stakeholders were held. And third, an internet survey was sent to all of the 160 stakeholders that were identified as “more or less” active in the remediation project. In the case study, both archival and field work methods were implemented to collect data, resulting in the following research process (See Figure 1) (TNO 2009; Sparrevik, Ellen, and Duijn 2011). The three data collection methods are described below.

3.1. Document analysis

The document analysis was conducted by examining different policy documents, hearings, newspapers articles, websites, etc. It served two objectives: first, retracing and reconstructing the course of events in the project; and second, identifying key stakeholders in the process. The first objective resulted in a timeline, indicating what happened at what time during the process in Oslo harbor. The time frame that we focus on runs from 1992 until 2011. Based on the timeline, the course of events between 1992 and 2011 can roughly be divided in five decision-making rounds, each round is closed off by a decision, based on which a new round of decision making unfolds. Second, an extensive list of stakeholders was constructed that had played an active role in the process. We defined “stakeholders” as people, organizations or groups affected by the issue with the power to make, support or oppose the decision or with the opportunity to provide relevant knowledge to the decision-making process (Susskind 1999). The document analysis resulted in a list of 160 people and organizations. From this stakeholder list, key stakeholders were selected, by their high formal or informal interest and/or influence in the process, representing both supportive and critical views. Next, in-depth semi-structured interviews with key stakeholders were conducted.

3.2. In-depth semi-structured interviews

The goal of the stakeholder selection was to incorporate as much diversity as possible, as the timeline revealed the many different interests and viewpoints that were attached

to the ADS project. The goal of the interviews was to identify the views and underlying values and arguments of various stakeholders on three different societal aspects of the sediment remediation project: their opportunities for participation, their opinion about the communication process and their appreciation of the supply of (expert) knowledge about potential risks.

The third step consists of a web survey designed to validate the initial observations about the course of the decision-making process according to a limited number of respondents.

3.3. Web survey

The web based survey, conducted in Norwegian, made it easy for the interviewees (who initially received the survey) to forward it to people they thought could add to the insights about the process. This approach is usually referred to as snowball sampling (Goodman 1961). The survey represented much of the stakeholder network that was more or less actively involved. It revealed the respondents' perception of the role they played in the decision-making process. Respondents were requested to identify their own role in the process: not involved, listener, information supplier, critical observer or participant. Moreover, they were asked how they appreciated the process, the final solution that was reached and the experienced amount of influence on the choice for the alternative solutions that were suggested during the process.

4. Introduction to the case study

The restoration of contaminated marine sediments has become a national environmental policy priority in Norway with 17 harbors prioritized for remediation. One of the harbors in which a large sediment remediation project was recently executed is the Oslo harbor remediation project. Oslo harbor is situated in the Inner Oslo Fjord as displayed in the detail on the map in Figure 2.

The goals of the remediation project were (1) to remove contaminated material from the harbor basin, thereby preventing the re-suspension and dispersal of environmental contaminants in the inner Oslo fjord and (2) to improve navigation depth in the interests of safe vessel traffic. In the remediation project, an ADS was selected for the disposal of the dredged contaminated sediments. The planning and construction of the ADS received a lot of attention from society, including actions against the dredging itself, large media coverage and public discussion about the project. At the same time, a comprehensive urban redevelopment project (the reconstruction of the E18 highway as part of the larger Bjørvika project) was being carried out in Oslo harbor and became deliberately intertwined with the ADS project.

4.1. Formal policy dynamics in the decision-making process

The formal policy process for the establishment of the ADS is structured by the legislative framework and the accompanying network of policy actors in charge. The legislative framework is based on formal requirements, such as the dredging permits that must be applied for with regard to the planning and actual construction of the ADS. An important part of the formal procedures is the execution of an Environmental Impact Assessment² (hereafter abbreviated to EIA). The formal legislative and administrative procedures for decision making on the remediation of contaminated sediments in Oslo harbor largely

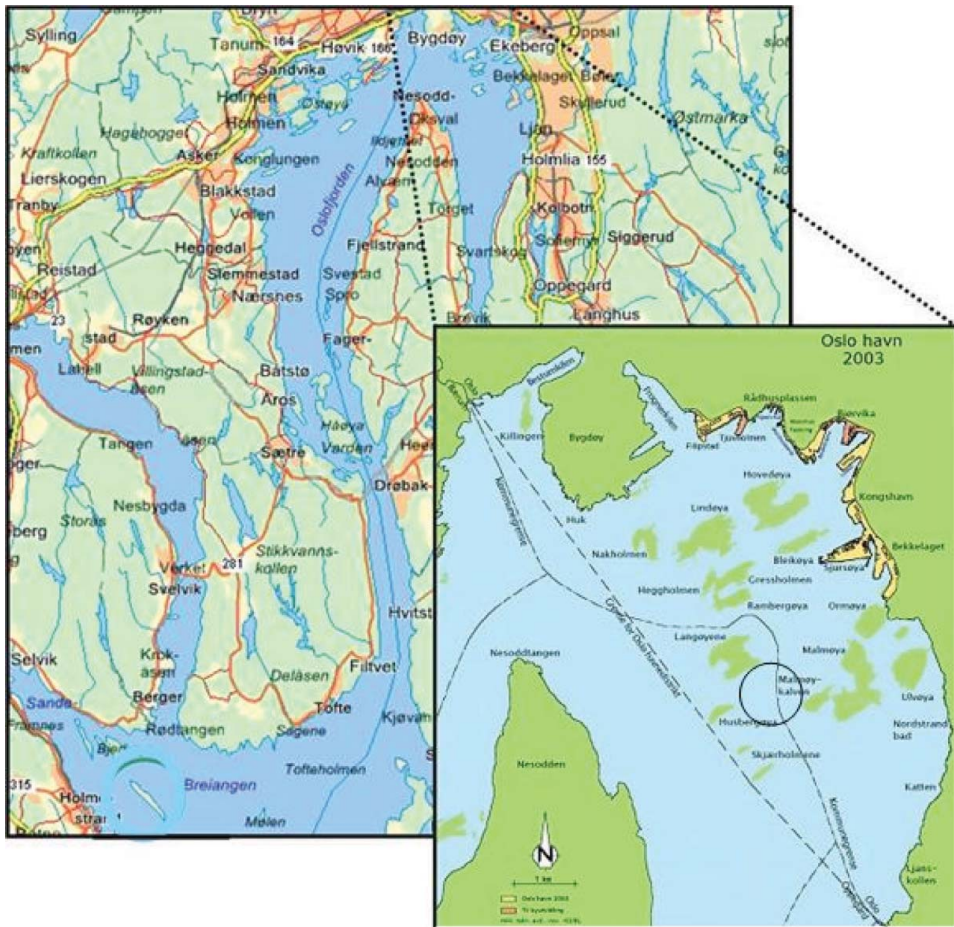


Figure 2. Map of Oslo harbor situated in the inner Oslo Fjord. See online colour version for full interpretation.

structure the activities undertaken by (government) organizations in the planning and implementation process. The formal policy process structures roles and tasks of the actors involved. The framework of the relevant formal procedures is represented in Figure 3, showing the formal, legislative decision-making process from application to approval/disapproval for the dredging and disposal of sediments. It also displays the responsible authorities and the central law and regulations, as well as EU directives.

The main actors in the formal process are identified through extensive document analysis, without intending to be exhaustive. The first two actor groups largely act on the interests and tasks they have in initiating and/or supporting the formal decision-making process. The latter two actor groups become involved based on the moral obligations to be informed about the formal decision-making and /or on the non-formal power they have to influence the formal process (adapted from De Bruijn, Ten Heuvelhof, and in 't Veld 1998; De Graaf 2007). This results in the following division of actor groups³:

- (1) *Project actors*: actors who are directly involved in the formal planning (including initiation and legislation) and implementation (contracting) of the ADS. In our

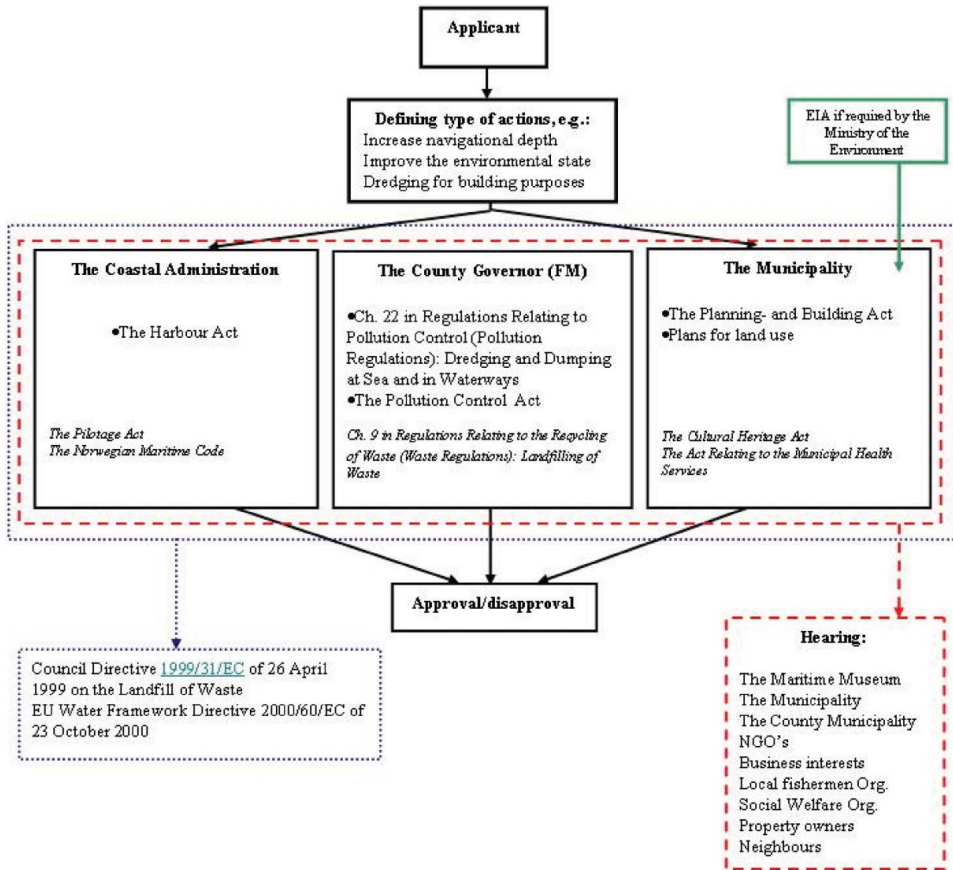


Figure 3. Formal legislative framework for permitting dredging and disposal of sediments in Norway.

case study, this group is composed of Oslo Port Authority (HAV) and Oslo Municipality (OM) as initiators, Norwegian Environment Agency (NEA), the County Governor of Oslo and Åkershus (FM) as legislators and Secora as contractor. During the planning stage of the process, the Norwegian Public Road Authority (NPRA) joins this group as initiator by bringing in the reconstruction of the E18 motorway/Bjørnvika project as an important external event to the ADS project.

- (2) *Researchers*: actors who are involved in exploratory studies, monitoring activities, *ex post* evaluation and/or second opinions with regard to the formal planning and implementation of the ADS. In our case the Norwegian Geotechnical Institute (NGI), Norwegian Institute for Water Research (NIVA) and Det Norkse Veritas (DNV) are active.
- (3) *Context actors*: actors who become indirectly involved in the establishment of the ADS, reacting to initiatives, legislative actions and/or to concrete implementation of (construction) work by contractors. This group is composed of actors in the periphery of the project, such as other government agencies (other municipalities or federal agencies), NGOs and pressure groups and activists.

- (4) *Media and public opinion*: actors who spark, shape and change public opinion with regard to the ADS, such as newspapers and other media and responses of individual citizens or stakeholders.

5. Reconstructing the policy game

The process along which the remediation project was initiated in the early 1990s and completed in 2011 can be reconstructed through five policy rounds. The first round (before 1992) marked the end of the “business as usual” approach. Snow from Oslo’s city streets is dumped in the harbor. Investigations regarding the impacts to water quality and the (possible) contamination of sediments are made. This round is closed off by the (implicit) decision to terminate the practice of dumping snow and investigate the sediments for potential contamination. Investigations documented high levels of contaminants. Consequently, a ban of dredging the sediments in the harbor was imposed.

The fifth round (2009–2011) included the time during the transfer of the ADS from the contractor to the Port Authorities which was formally delivered in June 2011. The formal approval from the environmental authorities was received later that year. However, in a sense, the round is still open because the monitoring of the ADS site continues.

In the remainder of this section we analyze, in-depth, the rounds 2–4. These are most interesting because this is when the policy game between the actors involved in the planning and implementation of the ADS project takes shape and is played out.

5.1. Round 2: 1992–1998: searching for policy options

For the initiation of the remediation project, a group of project actors composed of HAV and OM was formed in 1992. The initiators filed a permit request to FM in order to dredge sediment; however, this request was not approved by FM under the argumentation that no dredging could be certified in the harbor area. During the subsequent two years, the technical solution of landfill disposal of dredged material at two different geographical locations was examined and set aside as “not feasible.”

In 1995, a proposition for an alternative policy option was sent by HAV to FM and NEA for renewed approval. This policy option consisted of (1) dredging sediments, (2) the construction of a small scale, near-shore confined disposal site in the harbor area for the planned extension of quays, and (3) the construction of an ADS for remediation of the larger portion of the dredged material.

The next year, HAV sent a plan for remediation to FM for acquiring a permit to dredge and dispose of 500,000 m³ of contaminated sediments. Later that year, a formal hearing was organized to assess the societal responses to the proposed project. The consequence of this hearing was that only an ADS was perceived as the feasible technical solution. This solution entails the dredging of contaminated sediments, removing, and storing them at an ADS which would be capped to prevent contaminants leaking to the water. After further investigations, a location at Malmøykalven was selected due to its favorable technical characteristics.

5.2. Round 3: 1999–2005: formal planning process

The decision-making round is characterized by the formal planning process for the selected policy option, the ADS at Malmøykalven. The planning process is largely

guided by a formal procedure, the execution of an EIA. Between 1999 and 2003 the EIA-procedure was carried out by HAV. In 2000, the program of the EIA was approved by the NEA, based on which HAV could execute its planned activities. In the early stage of the formal planning process, the ADS project became coupled to another infrastructural project in the Oslo harbor area that was already well underway: the Bjørvika project in which the reconstruction of the E18 motorway was carried out. The reconstruction of the motorway, under the responsibility of the NPRA, included the building of a subsea tunnel between Bjørvika and Filipstad, right through the inner Oslo harbor. The building of the tunnel would generate dredged material as well, both contaminated sediments and clean clay. Documents from 1998 and 2000 already indicated that the NPRA anticipated that their dredged materials from the E18 project would require an approved disposal site. In the EIA-process (as early as 2001), the NPRA are mentioned as a financing partner for the establishment of the ADS. Furthermore, it was foreseen that the clean clay that would become available from excavating the tunnel could be used as capping material for additional contaminated sediments in deeper areas of the harbor.

In 2004, HAV and OM, supported by NGI and NIVA, drew up a final remediation plan for the execution of the intended project, based on the EIA. In this stage of the process, the context actors became more involved. For example, the plan was presented and discussed at two public meetings with stakeholders and “harvested” hundreds of (written) reactions from stakeholders. The public reactions were processed into the Regulation Plan for the project that was presented at a press conference. The Regulation Plan gave rise to an organized discussion between politicians and experts about the ADS at Malmøykalven.

In early 2005, NEA granted NPRA approval to dredge sediments as part of the E18 project. However, underwater disposal of contaminated sediments had not yet been approved. NEA required the completion of a Comprehensive Remediation Plan for the entire Oslofjord. The permit application for the construction of the ADS was approved by the Norwegian Pollution Authority in mid-2005 based on the Comprehensive Remediation Plan. Next, the permit was sent to various stakeholders to hear them. As many as 15 objections were received. In the meantime, the responsible authorities at the local level, OM had ratified the Comprehensive Remediation Plan.

Once the Comprehensive Remediation Plan was approved, the Regulation Plan for establishing the ADS was sent for approval to the Oslo, Nesodden and Oppegård municipalities. The municipality of Nesodden ratified the Regulation Plan in early November and OM ratified it a couple of weeks later. The municipality of Oppegård, however, objected to the construction of the ADS. The Regional commissioner for Oslo and Åkershus sent the case to the Ministry of the Environment for approval. In December 2005, the Ministry ratified the Regulation Plan for the ADS, closing off round 3.

This summary of the decision-making process in this round appears to be straightforward. However, the materialization of the potential connection between both projects led to non-formal dynamics that required behind the scene negotiations, as some parties remained reluctant to go along with the planning process. For a number of other parties, this opposition was unacceptable. The NPRA needed the ADS for disposal of the dredged material from the E18 project, HAV and OM needed financing from the NPRA to build the ADS. On top of that, OM needed the Bjørvika project – including the reconstruction of the E18 motorway – to help realize the spatial development plans of the city that were already conceived before 2000. The motorway represented a barrier separating the city from the waterfront on the eastern side of the harbor. By guiding traffic through a submerged tunnel, new residential and commercial functions could be developed. As one can imagine, OM had great interests in seeing this through.

5.3. Round 4: 2006–2009: implementation process

As stated previously, prior to the formal connection with the Bjørvika project there already had been objections to the construction of the ADS from various stakeholders, such as local citizens, NGOs and at least one municipality. Also, based on the amount of (scientific) studies regarding the potential impacts of the dredging and disposal activities, it is clear that the ADS project itself was not undisputed. Uncertainty and opposing viewpoints were present in the preparatory stages.

However, this resistance was not very problematic in the first phases of the project and was largely latent and restricted to formal procedural activities. For dredging and disposal of the sediments, HAV selected Secora as the contractor, who started their operations in February 2006. Almost immediately after the start of the operations, societal turbulence emerged. Local politicians suggested that the intended ADS would leak contaminants to the water, whereas some NGOs publicly stated that they would support the formal approval of the project. Societal opposition increased when another environment protection group reported NPRA, HAV and Secora to the police, accusing them of uncontrolled spreading of contaminated sediments. In addition, this group of people stole the equipment with which the operations were executed. In reaction to these actions, HAV, OM and NPRA stated that, in turn, any illegal obstructions to the work would be reported to the police as well.

After this, resistance against the operations in progress became even more manifest: unfavorable media attention about the supposed contamination of the waters around the ADS site, illegal actions against constructions and equipment used in the project and a referendum in Nesodden municipality concerning the ADS. The reactions of HAV to these obstructive actions were formal and defensive, grounded in threats about legal prosecution of obstructive actions and the provision of scientific evidence as a result of monitoring, indicating that nothing was amiss and activities were in accordance with the permit.

In 2007, an opposing NGO hired a foreign scientist to provide contra-expertise to prove that there were indeed increased levels of contaminations around the ADS site and thus indicating that the ADS-construction was leaking. Following this contra-expertise report an additional hearing was organized to discuss all sides of the project. Based on this hearing, the Oslo City Council decided that the dredging and disposal should continue.

Later that year, a national newspaper claimed that unfavorable information about the project was withheld. This claim was based on the outcomes of the independent research using sonar measurements that a professor at Oslo University had initiated at the ADS. For this study he had received both approval, as well as technical support from HAV and Secora. Both actors were very interested in the results, but instead of being informed first, the outcomes of the study were immediately published in the newspaper. During this period, the municipality of Nesodden organized a public meeting to inform the citizens about the project's progress.

Later in 2007, a national newspaper questioned whether the contractor was in fact operating within their permits, suggesting that the ADS was more or less being used to dispose of other contaminated waste than the excavated sediments from Oslo harbor. The claim was taken seriously by HAV who hired yet another research institute (DNV) to investigate. The third party investigation concluded that large rocks, excavated during dredging operations had been dumped from the surface water and into the ADS – thus breaking the permit which has stipulated that all material was to be pumped down into the ADS. This discrepancy reached its climax in a court case against the contractor who was accused of not following the permit. Although the contractor had violated the disposal

permit, it was determined that the level of contamination of the disposed masses did not exceed the threshold values, thus no negative consequences were observed at the ADS.

The dredging, disposing and capping of the sediments at Malmøykalven was finished in July 2009. However, the finalization of the actual construction works did not end the project entirely, as the transfer of the ADS from the contractor to HAV did not take place until June 2011.

5.4. Involved actors and their interests

The description of the rounds, as well as the activities of the actor groups involved, indicated an increasing interdependency. This is illustrated by Table 3, presenting the interests of the actors involved in the ADS project and the E18/Bjørvika project.

Table 3. Involved actor groups and their interests in both projects.

	ADS project	E18/Bjørvika project
Project actors and their interests, involved in formal dynamics		
HAV	Creation of disposal site for contaminated sediments from the Oslo harbor basin	Need for additional funding for the ADS project
OM	Creation of disposal site for contaminated sediments from the Oslo harbor basin	Need for attractive, water-oriented spatial developments sites
NPRA	Need for disposal site for dredged material from E18 tunnel project	Reconstruction of motorway through Oslo for improving the environment by reducing local air and noise pollution
Researchers and their interests, involved in formal dynamics (hired by project actors)		
NGI, NIVA, DNV	Providing (technical) expert knowledge for locating, constructing and monitoring aquatic disposal of contaminated sediments Providing contra-expertise	No apparent interests
Context actors and their interests, involved in non-formal dynamics		
Other municipalities in Oslo harbor area	Reluctance towards approving the construction of the ADS	No apparent interests
Environment protection groups (NGOs)	Predominantly opposing construction of the ADS (some NGOs were in favor)	Opposing high rise nature of projected buildings at waterfront
Researchers and their interests, involved in non-formal dynamics (hired by context actors)		
External expert	Raising concern about (potential) leaks in the ADS construction	No apparent interests
Media and public opinion		
Newspapers, websites	Reporting about risks of the ADS, such as leaking contaminants to the water	Voicing unfavorable public opinion about the height of projected buildings at waterfront

Table 3 shows the interdependency of both projects with regard to the actors' interests. The ADS project was needed by HAV and OM because of the need for disposing of dredged contaminated sediments from the harbor basin, and by NPRA for disposing of dredged material from the E18 tunnel project. HAV needed funding from NPRA's E18 project to build the ADS. OM needed the Björvika project of which the E18 project, including the submerged tunnel, was a vital component for realizing its spatial development plans at the waterfront areas. However, these plans gave rise to local opposition due to the disputed, high rise nature of some of the projected buildings.

6. Reflecting on the project's management style in response to non-formal dynamics

In the planning stage, the rules of the formal–technical game are largely dictated by the requirements of the EIA, grounded in Norway's environmental legislation. Based on abundant expert knowledge, well-defined politically sanctioned objectives and limited societal participation through public hearings, potential policy options were explored, prioritized and selected. In the final stage of the planning process, a decision on the most feasible solution was communicated to society. This approach is commonly referred to as “decide – announce – defend” (cf. Ducsik 1981; Susskind 1985), a vivid explanation of the one-sided and defensive nature of many decision-making processes that are grounded in the project management style.

In the case study, this style was visible in the rather technocratic search for solutions that were legally sanctioned and technically sound. The formal dynamics were set by the actors involved at the time: project actors (the initiators and legislators) and supporting research organizations. These actors played the game they know best: the “formal – technical game,” applying a project-oriented management style, and continued to do so even when the context dramatically changes. Based on formal procedures, grounded in legislation and backed by expert knowledge, project actors tried to conceive of potentially feasible solutions for the problem at hand. Involvement of context actors was more or less limited to formal public hearings for proposed solutions. Next to the reactions received in the formal process, project actors had to deal with the reactions of the context actors that arose through non-formal channels such as the media. This added to the need to adapt their behavior towards interaction-driven process management. We thus witnessed a project-oriented management style with some process-oriented elements but only within the boundaries of the formally prescribed phases and activities of the project. Perhaps this was partially due to the fact that the timing of the course of events in the decision-making game is often more or less “dictated” by the formal and administrative requirements in these types of processes. For example, it proved to be difficult for project actors to manoeuvre in coalescence with non-formal dynamics without negative consequences, such as financial claims or delay, because contracts with the contractors were already signed. Although attempts were made to give the dynamics of the game a more collaborative turn, these were not successful towards making a meaningful change.

When the actual implementation of the project began, the media and general public pro-actively attempted to influence the existing support for the project by providing alternative information and opinions. The latent resistance against the construction of the ADS became manifest and societal unrest emerged. However, this increased resistance did not result in a change of management style by the project initiators. On

the contrary, HAV responded even more defensive and used its formal authority to force the progress of implementation. They relied on formal expertise to document that no unacceptable changes to the environment had occurred. Their defensive style provoked even more resistance. In this stage, the emphasis shifted towards the non-formal dynamics that context actors and the media and general public generated through media coverage, protest actions, raising new concerns and initiating alternative research. Here, we see that context actors and media were able to pull the process away from the “formal – technical game” and shift it towards a “non-formal – societal game” which (theoretically) asks for a more open, process-oriented management style. However, in the implementation stage, the rules of the formal–technical game were (still) defined by the rationales of “linear project management” for construction work. The project must be delivered within the defined time frame and budget, with as few deviations as possible. Unfortunately, as illustrated in this case study, linear project management proved not to be a productive approach to accommodate societal turbulence. This management style was not really adjusted to the unexpected dynamics that arose. In round 2, the search for policy options was driven by technical requirements of the intended ADS. The management style did not include an inquiry into the societal requirements of the ADS. From an engineering point of view this was perhaps understandable, although one could imagine that working with contaminants could, in the longer run, lead to critical opinions of stakeholders. Certainly, when (expert) studies showed that the impacts of the dredging and disposal activities were not undisputed. The development of the ADS was approached by the project actors HAV and OM as a linear project: first, select the technically most feasible solution and location based on expert knowledge, then apply for a permit, inform the stakeholders through the formally required hearings, hire a contractor to build the site and then maintain and monitor the site. In round 3, the coupling with another project led to considerable interdependencies between both projects. Through agreements between the main beneficiaries, OM/HAV and NPRA, about this coupling the potential flexibility of reconsidering both solution and location had become even more limited. Unexpected dynamics in one project were likely to impact the course of events in the other project, decreasing the maneuvering room in either project. Next to this, some actors were confronted with the outcomes of the agreements between OM/HAV and NPRA, without benefiting from them. This increased the risk of opposition to which the management style must respond. However, OM/HAV did not tangibly change their management style; the ADS project was still managed as if it was a solitary project with little impact on its societal context and with moderate complexity. In round 4, there were only weak signs of changing the goal-realizing management style, even though the actual building operations led to tangible opposition and even physical obstruction. OM/HAV maintained reliance on the formal procedures they had set out, showing no signs of reconsidering the preferred solution and location. They stuck to the permit, and relied on both the possibility of legal prosecution of obstructive actions and the provision of scientific evidence to back their decision. Once stuck in the game, the project actors did not change their management style, but rather continued in the same direction. By doing so, they eventually got caught up in a game that wasn't entirely theirs.

With pursuing a project management style, project actors (implicitly) employed the timely and cost-effective planning and construction of the ADS project as a criterion for success. However, the rather rigid way of implementing this style, led to just what HAV/OM wanted to prevent from happening: considerable delay and, therefore,

more costs. Therefore, another equally important criterion should be the societally acceptable implementation of the ADS project. However, we see that relying on expert knowledge and formal requirements and procedures did not deliver the broad acceptance of the project. In addition, the project leaders HAV/OM were not capable of connecting their project to other interests, beside the connection to the E18 project from which they themselves also benefited. The management style to implement the project neglected the importance of including other, perhaps less tangible, interests present in the area. More importantly, it overlooked the obstructive power of other actors, including the media and the general opinion.

With regard to the criteria for success of the project, we have concluded that the timely and cost-effective planning and construction are the most important preconditions for the project actors and the hired contractor. The societally acceptable implementation was apparently not, as no tangible criteria were set for this objective. Deviating from the agreed time schedule and budget could lead to legal claims from the project actors as well as from the contractor. This means that the criteria for success seem to hamper the need for changing the project management style during the process. So, from a project management's point of view, the implementation process was unsuccessful (although the project was implemented in the long run). Moreover, with regard to societal acceptance, the project was also unsuccessful because it led to much societal turbulence and disturbed relations between government agencies and citizens, as well as between experts and citizens and among some municipalities.

7. Conclusions: dealing with non-formal dynamics in complex projects

Based on this paper, four important conclusions can be drawn. First of all, it is important to underline the importance of unexpected, surprising consequences of deliberately made couplings. Although in the literature the positive consequences of making connections between processes are often emphasized in order to realize synergy and breakthroughs (Van Gils and Klijn 2007; Edelenbos and Teisman 2013), our case study shows that connections can also be very dysfunctional due to the unintended import of dynamics of "neighboring action systems" (Teisman, Westerveld, and Hertogh 2009). Connecting complex issues or games to each other can multiply the complexity and controversies of issues and can provoke a chain of reactions. These unexpected feedback mechanisms are difficult to predict beforehand and can make an issue nearly untamable. Second, our analysis underlines the importance of applying a management style that fits into the characteristics of the issue and its context. A more process-oriented management style is necessary when the governance process is highly unstable. A more project-oriented management style is useful when the process is stable and non-controversial. As such, it further substantiates the claim made by other authors who have analyzed the relation between issue context and management style, and the relation between management style and project outcomes (van Meerkerk, van Buuren, and Edelenbos 2013). Third, because both the issue and its context can easily change (from stable to erratic and vice versa), it is important to keep a management strategy flexible. Until now, most authors approach the issue of appropriate management or leadership styles as a single choice which can remain unchanged during a planning process. Our analysis underlines the importance of being able to change existing styles and strategies easily (cf. Duit and Galaz 2008). Complex planning issues remain complex, even in the implementation phase (when most public managers shift towards a project-style management strategy).

Therefore, the management style has to remain flexible in order to respond to unexpected dynamics. Finally, our case study indicates that there are many barriers to change management styles. In complexity terms: there are many sources of negative feedback that hamper the ability to timely adjust current styles. Managers become entrapped in their current management style, because of earlier success, and do not recognize the signals that urge them to change their behavior. A core competence easily becomes a core rigidity (Leonard-Barton 1992). Other ways of doing are not yet part of their repertoire. What we see confirms the existing insight that during implementation the focus is mainly on project management: realizing the job in time and within budget with a strong focus on risk reduction, planning and control (Kerzner 2013). Moreover, also procedural rules and requirements and contract agreements with private actors are important barriers for changing management styles. Applying a specific management style is thus not fully a “free choice” but is partly the consequence of the formal framework in which a planning process is executed or the contractual agreements with private contractors.

As we saw in our case study, project actors often do not dispose of the adequate capabilities to adapt to the changed dynamics. To our understanding, this phenomenon has to do with the following pitfalls:

- (1) the absent awareness of the different requirements of each project stage and the limited capacity, and perhaps resources, to look beyond the stage the project is in and thus to anticipate the consequences of making couplings between projects;
- (2) the ignorance of the non-formal influence that context actors (non-initiating actors) have over the course of the project and which can increase, or become manifest, unexpectedly;
- (3) the inability of project actors to change their strategy during the course of the project, when societal unrest expands.

Project actors may find it difficult to change their management style when being confronted with unexpected contextual changes and stick to their (limited) repertoire of management activities. However, professional project actors, initiators, managers as well as legislators need to develop the capability to adapt their management style accordingly to contextual dynamics. These dynamics only become more intricate as we can witness an increasing need for organizing and implementing multifunctional, multipurpose and multi-interest projects which must be tied together in one process.

Project managers who are capable of employing an adaptive and complexity-embracing management style are often qualified as “boundary spanners” (Williams 2002). Boundary spanners acknowledge the need to gain an understanding of people and organizations outside their own community, as they are acting in inter-organizational frameworks of intervention that are developed around the perceived need for resolving complex societal problems. Hosking and Morley (1991, 228) emphasize the capability of “understanding the social construction of other actors, and how they define the issue in relation to their own values and interests, know what outcomes and processes each would value, know who needs to be involved, know who could mobilize influence and so on.” Williams (2002, 103) draws attention to “the pivotal role of individual actors in the management of inter-organizational relationships,” by referring to their connective, political and entrepreneurial skills, competencies and behavior. Dynamic policy contexts put much strain on the political skills of boundary spanners which are described by DeLeon (1996, 508) who refers to “catalysts who bring together problems and solutions

that otherwise would bubble chaotically in the conventional currents of modern policy streams.” Williams (2002, 110) refers to the boundary spanners’ capacities of “opening policy windows” (cf. Kingdon 1984), in the sense that they often act as policy entrepreneurs.

Next to the challenges for professional project actors, the contextual dynamics around complex, large-scale infrastructure projects put high and new demands on the way in which public planning procedures are structured and public-private collaboration is arranged. Until now, both are important barriers for a more adaptive management style that easily responds to changing conditions. From a procedural and contractual perspective, changes during the process are easily seized to reopen the negotiations all over again. This is at odds with the observed tendency towards more integrated, composite projects that necessitates a complexity-embracing management strategy. Ross (2003) advocates to deploy a strategy of project alliancing to ensure a more adaptive collaboration between (public) clients and (private) contractors. Especially when projects have complex and unpredictable risks, high complexity and a large chance on scope changes, Ross (2003, 320) claims that alliancing enables the project partners to share the responsibility to keep the project on track. A positive side effect of alliancing is that it has a depolarizing impact on the relation between the contract partners (cf. Gallagher and Hutchinson 2001) because it decreases filing legal claims and focusing on obtaining additional work.

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Notes

1. We draw attention to the fact that we choose not to speak of informal as a contrast to formal. Instead we use non-formal to keep away from detailed discussions about formal and informal decision making.
2. This is the case in many (western) countries when planning and implementing a physical-spatial project.
3. We use the abbreviations in the description of the decision-making rounds.

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