

Considerations in Designing an Evaluation System for Adaptive Delta Management

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Abstract

New planning approaches put new requirements on evaluation. A recent innovation in the water domain is adaptive delta management (ADM). ADM supports long-term planning in the face of uncertainty. This paper discusses the main considerations for the design of an evaluation system for ADM, departing from literature on evaluation systems, adaptive management and a case on Dutch delta management.

Keywords

Evaluation systems, Adaptive Delta Management, Monitoring, Multi-Actor Systems, The Netherlands

Introduction

Monitoring and evaluation have a clearly defined space in textbook cycles of planning and policy-making. Increasingly, however, these textbook approaches are being modified or replaced by approaches more suited for situations characterized by the prevalence of actor networks and new uncertainties arising from exogenous factors (e.g. climatic change and socio-economic developments) and interactions between society and its environment. An emerging family of new approaches with particular relevance for evaluation is that of adaptive management and adaptive decision-making. The idea is to plan ahead, possibly even for a very long-period (more than 50 years), but with an awareness of current knowledge limitations. This awareness translates into an explicit identification of uncertainties, through different plausible adaptation pathways, and an explicit effort to keep an eye open for developments that unfold during plan implementation. This should help to identify robust and/or flexible actions for the short term, to avoid lock-in effects and to increase the capacity to adapt plans in the future if necessary.

Adaptive Delta Management is a hallmark of the Delta Programme that was initiated after an advice of the second Delta Commission on how to prepare the low-lying Dutch delta for future climate change in 2008. This Delta Programme is a national programme in which multiple public, private and societal actors participate in order to secure flood protection and freshwater supply for many generations ahead. In its first years, activities in the Delta Programme have concentrated on the process to reach key so-called Delta Decisions by the end of 2014. As the end of this process nears, attention is now moving towards the continuation of the programme from 2015 onwards. The implications of adaptive planning for implementation, monitoring and evaluation are not fully clear, and it is now urgent to put these issues on the agenda.

The Delta Programme is facilitated and coordinated by an independent Delta Commissioner, backed by a Delta Law and a Delta Fund. The establishment of these new entities creates opportunities to

make the process truly adaptive, and think afresh, not being constrained by existing structures and practices. Evaluation expertise seems helpful to support the characteristic of being adaptive in this new planning approach. However, the situation of making an adaptive plan is relatively new for evaluation too, requiring the profession to rethink its role. The ambitions of the Delta Programme are to initiate and facilitate a continued process of collective learning. Evaluation should be forward-looking and fit in an ongoing and continuous process of joint learning and adaptation, instead of being a one-time evaluation for a single project or programme.

What is needed then, is a new evaluation and learning system that is fit for the purpose of the implementation of an adaptive plan. But how does one go about developing a new societal evaluation system, when the scientific community has only recently put the study of existing evaluation systems on its agenda (Leeuw and Furubo, 2008)? We will outline some preliminary ideas for the design of such an evaluation system, departing from certain underlying conditions and requirements. Each of these conditions contributes useful building blocks, as well as potential limitations and complications. We will discuss these, conveying insights as they are now emerging from our study of literature and interviews and interactions with Delta Programme experts and stakeholders.

Adaptive delta management

Key features of adaptive delta management in the Delta Programme in the Netherlands

Among policy-makers and planners, uncertainty has been an important theme in recent years. Much of contemporary policy and strategy-making requires a long-term horizon, whereby decisions have to be made on long-life investments with big societal impacts such as infrastructures, spatial planning and regulations. The acceptance of uncertainty as an inevitable part of long-term decision-making, has given rise to the development of new tools and approaches to deal with *deep* uncertainty. These tools and approaches include Dynamic Adaptive Policy Pathways (DAPP) (Haasnoot et al. 2013), adaptive policy-making (Walker et al. 2001, Kwakkel et al. 2010), adaptation pathways (Haasnoot et al. 2012), adaptation tipping points (Kwadijk et al., 2010), robust decision making (Lempert et al. 2003), and assumption-based planning (Dewar et al. 1993). A key feature of these adaptive planning approaches, is that they incorporate an explicit awareness of uncertainties about the future, including thoughts on *when* and *how* to adapt existing plans.

In the Netherlands, the domain of water management has a multiple decades period of experience in scenario development (cf. Haasnoot & Middelkoop (2012), aiming at developing management plans that are 'future proof' in spite of the uncertainty of the future. More recently, the use of adaptive thinking in the Delta Programme has been labelled Adaptive Delta Management (ADM). Its stated distinguishing features are (Van Rhee, 2012: 6; Bloemen, 2014):

1. Thinking in adaptation *pathways* instead of end situations;
2. Connecting short-term decisions with long-term tasks;
3. Valuing flexibility and reducing the chances of under- or overinvestments and lock-in;
4. Connecting investment-agendas for delta management with those of other parties and in other sectors.

Analytical support for Adaptive Delta Management is based on the aforementioned adaptive planning literature. Key concepts here are adaptation pathways, signposts and triggers. These are also highly relevant for monitoring and evaluation, as will be explained.

Adaptation pathways, signposts and triggers

Figure 1 shows an adaptation pathways map and its key components. The adaptation pathway provides an overview of intended actions: measures that are to be implemented as part of a certain

pathway. Actions may change at some point in the future, and these decisions are envisioned when a “transfer station” is reached whereby one action may be replaced, or supplemented, by another. Also, actions may reach the limits of their usefulness at some point in the future, meaning that an “adaptation tipping point” is reached. Something else, or additional, needs to be done, or policy outcomes will no longer be satisfactory.

For instance, in the case of the Delta Programme in the Netherlands, adaptation pathways have been developed for several issues. The pathway for the management of water availability from the national IJsselmeer reservoir, for instance, starts with a set of actions based on the availability of a freshwater layer in the lake of 20 cm, but foresees that a possible future action might entail a freshwater layer of 40-50 cm (DP 2014). This awareness of possible future transfers to other actions, enables one to consciously keep these options open. For the IJsselmeer, this might entail preventing or discouraging developments around the IJsselmeer area that might make a higher fluctuation of water levels in the future more difficult. For instance, building in zones that are not protected by, or very close to, existing dikes.

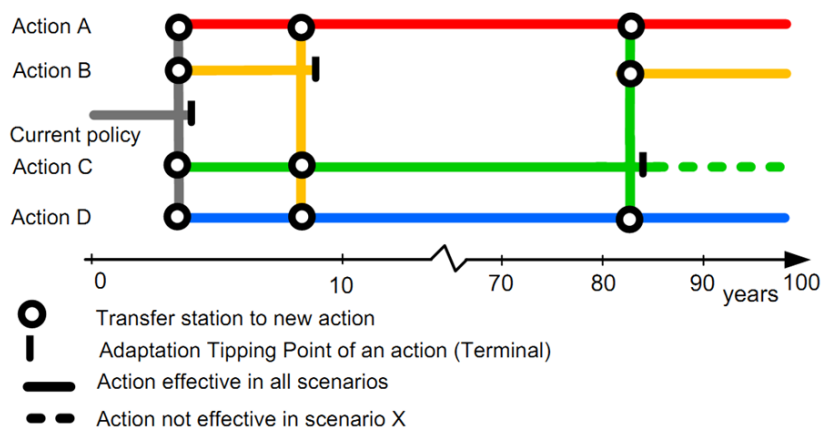


Figure 1: Adaptation Pathways Map (Haasnoot et al., 2013, Fig.2)

In the application of adaptation pathways, monitoring is organized based on the use of signposts and triggers (Haasnoot et al., 2013; Kwakkel et al., 2010; Walker et al., 2001). Signposts are the variables that one needs to monitor, as they provide critical information to assess the success of plan implementation. Triggers specify the expected values for these variables over time. Thus, comparing observed values of signposts with their pre-specified trigger-values, enables one to see if adaptation decisions need to be taken, if transfer stations are reached and if the logic behind an adaptation pathway itself still leads to satisfactory results. When it comes to monitoring and evaluation, assumption-based planning (Dewar et al., 1993) suggests to focus on signposts and triggers that help ‘test’ the assumptions that are most important and most uncertain for the success of a certain pathway. These assumptions are called ‘critical assumptions’.

The multi-actor-dimension in evaluation for dynamic adaptation policy pathways

Decisions have to be made when transfer stations are reached on an adaptation pathways, and they should be informed by the results of monitoring and evaluation. Each of these decision situations is, in a pathway map, represented by a node. And each node represents a decision that involves multiple actors. For instance, in Figure 1, the pathway from “Current Policy” to “Action D”, at the bottom of the diagram, may require the active support of various actors. These might be different from yet some other actors whose support is required when transferring from the “Current Policy”

pathway onto the “Action A” pathway at the top of the diagram. The M&E system should deliver the information needed by each of these actors, to enable them jointly to take a well-informed decision.

Furthermore, the M&E system should deliver the information needed to monitor progress on a pathway in the period in between a decision point, and to ‘test’ the assumptions underlying the adaptation pathways. An action on an adaptation pathway map, is typically a strategy composed of multiple actions, to be taken by multiple actors. The progress and the assumptions that different parties are interested in, might well be different. For instance, in the IJsselmeer example, local farmers might be interested in the salt water intrusion and/or irrigation water availability that results from existing management regimes, whereas nature organizations may be interested in the natural dynamics that are facilitated or disturbed by the management of the IJsselmeer-level.

In both cases, what is useful information for an actor depends on the priorities and decision options for that actor.

Evaluation systems

Characteristics of evaluation systems

Adaptive Delta Management, given its focus on linking short- and long-term decisions and adaptation pathways, needs a well-organized system for monitoring and evaluation, which goes beyond an ad-hoc arrangement of individual evaluations. What is needed, is an evaluation system for ADM. A starting point for exploring the considerations involved in setting-up such a new evaluation system, is provided in a paper by Leeuw and Furubo (2008) that put evaluation systems on the research agenda of the evaluation community.

An evaluation system is defined by Leeuw and Furubo (2008) by the presence of four characteristics:

1. A distinct epistemological perspective: An agreement among actors of what they are doing and why. The kind of knowledge that is produced is a part of this.
2. Organizational responsibility: Evaluation activities must be carried out by organizations and must be institutionalized, involving minimally a producer and user of evaluations.
3. Permanence: Evaluation activities need to be part of an ongoing process, whereby ad-hoc evaluations are being replaced by planned evaluation activities and organizations with a more permanent character.
4. A focus on the intended use of evaluations: the information from evaluative activities needs to be linked to decision- and implementation processes.

Leeuw and Furubo also recognize at least four different types of evaluation systems, of which the “monitoring and evaluation system” is most pertinent for ADM. Monitoring and evaluation systems seem based on an epistemological perspective whereby it is assumed that knowledge about earlier interventions will be useful to inform decisions about future interventions, and that capacity building in relation to such systems helps to improve the learning capacity of the (public) sector (Leeuw and Furubo, 2008: 164).

Purposes of evaluation systems relevant for ADM

Besides recognizing the key characteristics of evaluation systems, we should also address the purpose that such a M&E system for ADM should serve. According to Davies et al. (2007), the most general underlying purposes of evaluations in government settings are to promote accountability and to improve governmental management. Put loosely, evaluations should help government and the society at large to address two questions about their activities: “Is it right, what we’re doing?” and:

“Could we do better?”. One can recognize the focus on one or both of these purposes in all four types of evaluation systems discussed by Leeuw and Furubo (2008). Hanberger (2011) identifies six functions of evaluation systems, which can be roughly clustered into three groups of accountability and legitimacy, improvement and learning, and symbolic or ritual functions. For ADM, improvement and learning are likely functions of an M&E System. Because many different organizations are involved in the implementation of ADM, some degree of accountability of these organization, to each other and to the general public, will also be needed.

Evaluations that are to serve a purpose for learning and improving future decisions are assumed to work through mechanisms that are similar also in other fields of policy learning or collective learning in policy settings. They require that information is *acquired*, is *shared* and *interpreted*, and that it then is turned into ‘*learning products*’ such as new beliefs but also new strategies or policies (Gerlak and Heikkila, 2013; Nilsson, 2006)

Evaluation systems for Adaptive Delta Management (ADM)

The application of policy evaluation principles and methods to adaptive delta management is not straightforward. Challenges that have been known to exist in the field of policy evaluation will also affect its use for ADM. Furthermore, ADM offers some further complications of its own to the use of M&E systems.

The usefulness of evaluations and limits to learning from evaluation systems

An adaptive management cycle ends with a conscious decision, in light of new insights or changing circumstance, to change certain strategies, or to consciously extend existing strategies. Often, however, the use of evaluation to initiate change seems problematic. In many cases, evaluations are ‘stand-alone’ studies; although they end with recommendations, they are only weakly linked to subsequent policy decisions. For adaptive management, strengthening this link is critical.

However, as soon as this link between evaluations and their use for decision-making is strengthened, other problems arise. Literature on performance management indicates that, when evaluation outcomes have clear consequences for subsequent decision-making, perverse effects are bound to occur (De Bruijn, 2007). For instance, the involved participants will learn how to ‘game the system’; they will be careful in sharing and contributing information, and evaluation outcomes will be politicized. All of these violate the open and safe environment needed for learning. This leads to the paradox that, while monitoring and evaluation instruments are necessary and should be linked to change if they are to be part of an adaptive management process, ensuring such a link is likely to create an environment that violates basic conditions of learning (Van Thiel and Leeuw, 2002; De Bruijn, 2007).

The difficulties involved in securing learning from evaluation systems are acknowledged also in the publications on these systems. Leeuw and Furubo hypothesize that evaluation systems produce largely routinized information for ‘single loop’ learning but not for more fundamental learning. They tend not to question the underlying assumptions of policies, which is a serious problem if there is a need to reflect on the critical assumptions as expected in adaptive delta management. Immonen and Cooksy (2014) show how in the M&E System in the international network of CGIAR research centres, the use of indicator information in subsequent allocation decisions influenced performance reporting by the centres.

Challenges in the use of policy evaluations for ADM

Maintaining a sense of urgency

Compared to conventional plans and policies, the long-term focus of ADM makes it more difficult to maintain a sense of urgency. Whereas plans and policies typically have a timespan that ranges from months to as much as 10 or 20 years, the horizon for the delta planning in the Netherlands is 50 to 100 years (Delta Programme 2014). In most of the adaptation pathways foreseen in the national delta programme, the first adaptation decisions are foreseen only ten or twenty years from now. Actors do not necessarily recognize the value of more monitoring and evaluation efforts to inform decisions on pathways that are foreseen ten or twenty years from now. This affects the securement of resources needed for continued monitoring and evaluation among actors.

Setting targets against which to evaluate

Adaptive delta management does not specify the blue-print strategy and fixed end-states typical of traditional planning approaches. With adaptive management, one sets sail on a journey along an adaptation pathway. This is not a journey that is bound to lead from point A to a clearly specified point B, e.g. from Rotterdam to New York. Rather, this journey will go from point A to some point in the future, far far away, where life is good. Abstract long-term goals may be set for this 'good life', but translating them into measurable short-term targets is more difficult. Yet, without such short-term targets, one does not know if one is going in the right direction and if the speed of progress is satisfactory.

Complex systems resist policy learning

Adaptive delta management typically deals with complex systems. It is this complexity that increases the need for adaptive management in response to long-term uncertainties; For 'simple', or at least, linear systems, top-down planning may do. This complexity means that there are not only future uncertainties, but also severe limits to the current understanding of the system. In these complex systems in delta regions, changes may be absent or sudden, due to threshold effects, non-linear cause-and-effect relations and reinforcing or balancing feedback loops. Therefore, even if short-term targets have been set and are being monitored, the limited understanding of the delta system makes it easier for actors to dismiss disquieting signals. What should be a wake-up call, or at least a trigger for focused learning, may be ignored or reasoned away. The tendency for such behaviour is likely to be strong, as it will be easier than facing up to the disappointment or embarrassment of not meeting targets (Argyris and Schön, 1996).

Conditions in designing M&E Systems for ADM

Conditions and challenges

Monitoring and evaluation could offer useful information to support ADM. However, there are serious challenges to the realization of a working M&E system that provides useful information for adaptive delta management. Based on the above, one can locate challenges in connection to three important conditions:

1. Stakeholder support for collaborative M&E
2. Useful info obtained from M&E
3. Policy learning and change (and back to stage 1)

Going from one part to the next, certain thresholds need to be overcome, as illustrated in Figure 2.

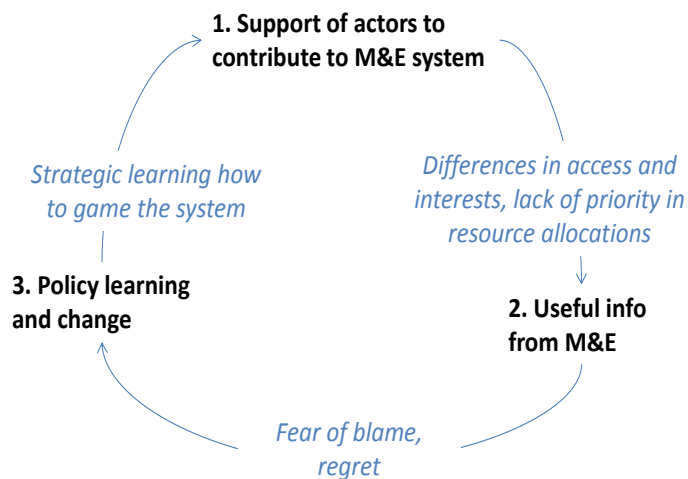


Figure 2. A negative reinforcing cycle in the design of monitoring and evaluation (M&E) systems

1 -> 2. Support from different actors is needed in order to obtain useful information. As many parties are involved in the implementation of adaptive plans, and as different parties will have different access to observe the impacts of implementation, many parties will be needed for an efficient collection of monitoring data. However, securing the necessary resources for individual and coordinated efforts will be difficult. Individual efforts are needed, as well as coordination work.

2 -> 3. Information from M&E systems is intended to inform policy learning and change. However, this use may be difficult. The key obstacle to learning in organizational settings that involve multiple parties, is a fear of embarrassment, blame and regret (Argyris and Schön, 1996). One cannot expect actors to freely share information that might later be used 'against' them. Furthermore, some parties may fear that the policy change that might result from learning, may lead to changes into undesired directions.

3. -> 1. M&E systems are not terminated once results of a first set of information have become available and have been translated into learning and change. Rather, the system should continue to exist and to nurture a process of learning-by-doing. As a new cycle starts, participants will have learned not only about the adaptive plan, but also about the M&E system and its use. One should avoid the performance management paradoxes to poison the process, as strategic learning on 'gaming the system' is looming in the back. Such learning can increase for instance behaviour to distort monitoring information or its interpretation, and/or a reluctance to contribute actively.

Conditions and contributions

It is good to see the challenges ahead, but one also needs a positive vision. Not something to avoid, but something to promote. One can see that the cycle shown in Figure 2 is primarily driven by the multi-actor dynamics involved. Almost thirty years ago, Greene published a more positive cycle that described conditions through which stakeholder involvement in earlier evaluations would positively contribute to their readiness to also contribute to and use future evaluations (Greene, 1988). This cycle is shown in Figure 3, taken from a larger diagram in the original paper.

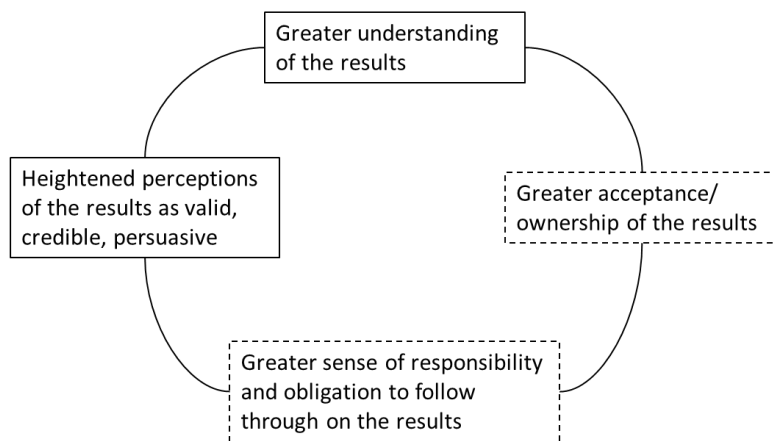


Figure 3. A positive reinforcing cycle for M&E Systems that are useful. (Source: Greene 1988: Fig 1)

In this positive cycle, two conditions can be positively influenced by a successful participatory evaluation process. The perceptions of the results as valid, credible and persuasive is influenced by the *political dimension* of the process: the balance between the powerful and less powerful evaluation participants. Greater understanding of the results can be influenced by *cognitive dimensions* such as ongoing active discussions and information processes. It can also be influenced by an *affective dimension* related to individual feelings of worth and value.

Towards building blocks for a design

Looking at both cycles, one can see a need for a careful design. A well-designed collaborative M&E system can initiate a positive dynamic, but this dynamic will not ensue if conditions that trigger a negative cycle are not treated appropriately.

Greene (1988) points to the importance of Cognitive, Affective and Political dimensions. Weiss (1999) discusses Interests, Ideology, Information and Institutions as the four I's that shape public policy. As a corollary, the design of a policy-relevant M&E system should also address those four I's. De Bruijn (2007) offers three key design principles, based on three underlying values, for the design of performance management systems in the public sector. Trust and fairness are linked to the design principle of interaction, content to variety and liveliness to dynamics. Here, we use the latter as a starting point and discuss them shortly.

Content and Variety

The usefulness of an M&E System will depend on its content. For ADM, it should help the national government agencies in charge of the Delta Programme to monitor and assess the national adaptation pathways. However, other actors will have other information needs. Actor support for the M&E system is likely to increase if the system is clearly aligned with individual agendas and information needs. These might be different from the information needs of the overarching delta programme. There are methods that help to elicit and structure this variety in content, often based on some theory-based logic or systems approach that recognizes that different actors are interested in different programme theories (Benjamin and Greene, 2009; Hermans et al., 2012). Each of these theories will need to deliver signposts for monitoring and evaluation, if the system is to be considered worthwhile to all involved. At the same time, there is a need for coordination. In the end, ADM provides the principal reason for the M&E System, and the various monitoring results need to be brought together as part of a collaborative effort. This requires that there is at least one 'champion' whose individual agenda requires a coordinated M&E effort. The Delta Programme

Commissioner is the logical 'champion', possibly backed by an independent (semi-)government agency that is assigned institutional responsibility for the M&E System for the Delta Programme.

Trust, fairness and Interaction

The fears about the interpretation and translation of M&E information are difficult to fully remove. Trust in a fair use and process is critical here. Such trust is typically built through regular interactions, as in the 'cognitive dimension' of Greene (1988), where regular discussions are considered a positive factor. Trust, however, needs to be built. Interaction at the design stage of the M&E system will be required to ensure that the epistemological basis of the system is sufficiently shared among the participants: what is the M&E System doing, and why?

When it is not yet possible to fully trust the other *parties* involved in an M&E system, trust in the *system* can still be built by giving participants more control over the system. What may help is to agree on clear process rules, including rules for sharing and ownership of (part of) data among the various contributing participants. A basic rule that is being considered for the Delta Programme is: if you want (to claim a need for) change, you have to table your data. This aligns interests and information. It does not, however, address issues that deal with information asymmetries, by which in this case we mean the situation where one party has access to information that is primarily of interest to another party.

Dynamics

A system that is fixed and rigid will, sooner or later, be subject to strategic learning by the actors, with a clear risk of behaviour aimed at 'gaming the system'. The only way to prevent this, is to regularly review the existing systems and adapt them as required. Here, it will be useful to realize the importance of E&S Systems design as a design activity. Research on the design of information systems suggests the use of ongoing iterative cycles, whereby the design artefact (the M&E system) is connected to a knowledge base and its application environment (Hevner, 2007). This would apply to the design of M&E Systems for ADM as well. And of course, there is a need to carefully balance change and stability (see also De Bruijn, 2007: 103).

Conclusion

Evaluation as a field has for long aimed to contribute to a learning society. Today, this ideal is shared and acted upon in many more fields associated with public policy making. As this leads to new policy making approaches and structures, as in the case of delta management in the Netherlands, new opportunities arise to bring evaluation knowledge to fruitful use. This requires new evaluation systems that respond to the needs and requirements posed by new policy making environments. This paper reviewed conditions for a new M&E system for Adaptive Delta Management. This served as a first starting point for design, the potential use of which was cursory explored by the formulation of some more operational building blocks.

The initial findings for this case suggest that the design of new evaluation systems is important for the success of ADM, difficult, but possible. Research into the design and engineering part of new evaluation systems will help to ensure that evaluation continues to bring benefits to society and public policy.

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