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Learning in the face of change: The Dutch National Collaboration Programme on Air Quality

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Abstract

Learning is essential in allowing policies and programmes to become adaptive to uncertain and changing circumstances. In this article, we use the case of the Dutch National Collaboration Programme on Air Quality (in Dutch: *Nationaal Samenwerkingsprogramma Luchtkwaliteit* (NSL)) to argue that the organisation of learning processes influences the extent to which policies and programmes can adapt. Learning is a diverse process that focuses both on improving knowledge of the effects of possible policy strategies and on bargaining and negotiation in which we interpret and make sense of such knowledge. Learning strategies can be organised by either focussing on exploring new ways to understand and approach problems or on exploiting existing knowledge, measures and capabilities by optimising and refining them. To be adaptive, it is important to balance both strategies, as otherwise two main risks might undermine the programmes' adaptive capacity. First, there is the risk that the implementation of adaptive programmes is constrained by premature consensus, constraining the capacity to learn regarding the suitability of, and agreement on, existing problem definitions and programme goals during programme implementation. Second, there is also the risk of premature programming, constraining the capacity to learn regarding the suitability of the actions and approaches adopted. What makes the NSL such an interesting case study is that while the programme was designed to be adaptive on the basis of an on-going learning process, in practice, it largely failed to do so. On the basis of 67 interviews with stakeholders in the NSL and two focus group discussions, we show that the NSL failed to

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anticipate both risks. Processes of learning have become marginalised and focused predominantly on exploitation at the expense of exploration. As such, the NSL convincingly shows how a lack of organising learning is constraining the capacity to adapt to changing circumstances and also contributes to its possible failure.

Keywords

Programmes, adaptive planning, learning, exploitation, exploration, environment, infrastructure

Introduction

Air pollution is among the most pressing environmental problems challenging the health and well-being of European Union (EU) citizens (e.g. Atkinson et al., 2001; Guerreiro et al., 2014). Despite intensified efforts to reduce pollutants such as nitrogen oxides, sulphur oxides, lead and small particles in ambient air (cf. EC, 1999, 2008), a recent review of the European Commission concluded that European air quality standards are still being flouted in more than 130 cities across 23 of the 28 EU member states (EC, 2017). As for example Busscher et al. (2014) explain, directly addressing the main contributors of urban air pollution, most notably energy production, industry and transportation, runs counter to alternative policy demands, such as industrial development, urban expansions or additional transport infrastructure. In approaching this trade-off between policy ambitions, policies and programmes that are adaptive and enable a combination of different policy priorities attract increasing attention, both internationally as well as in the Netherlands (see, e.g. de Oliveira, 2011; Van der Straeten et al., 2012; van Rij and Korthals Altes, 2014).

The Netherlands, in particular, has developed a National Collaboration Programme on Air Quality (in Dutch: *Nationaal Samenwerkingsprogramma Luchtkwaliteit* (NSL)) that explicitly aims to combine key urban and national policy priorities as spatial and infrastructure developments with air quality policies – so-called mitigating measures – so as to ensure that European air quality standards are being met everywhere in the country.

In order for programmes such as the NSL to be adaptive and to accommodate ‘multiple preferences’, Christensen (1985: 65) argues that these should facilitate a process where either bargaining ‘may compensate various interests through explicit quid pro quo trades’ or where ‘adapting technology to achieve several goals at the same time’ may ‘mute potential difficulties’. Facilitating bargaining and adapting technology are two strategies the Dutch are also currently aiming for. On the one hand, the NSL is based on a collaborative effort of various key governmental departments on different levels of authority. It does so by allowing for bargaining processes where learning can take place on how the air quality objectives relate to other policy objectives and where consensus among participants about the trade-off between these objectives might be established. On the other hand, the NSL also explicitly means to be an adaptive policy programme: ‘the NSL has to be flexible and dynamic to anticipate changed circumstances and insights that are likely to emerge’ (VROM et al., 2009: 24). To be able to do so, the NSL concentrates on learning about the effectiveness of existing policy instruments and on the development of new approaches and mitigating measures. Next to Christensen’s call for ‘adapting technology’, therefore, the NSL also means to create a process of learning-by-doing, particularly regarding the monitoring of air quality and the development of strategies that help reduce air pollution. Consequently, the NSL highlights the importance of adapting to new information and knowledge, with experimenting and

learning being the prime input for such adaptations to occur. It is a strategy even going a step further than the advice provided by Christensen in 1985, as it also resonates with more recent academic work on adapting to uncertainty through processes of learning (e.g. Brunner, 2010; Chaffin et al., 2016; Folke et al., 2005; Gupta et al., 2010; Hadorn, 2016; Pahl-Wostl, 2009; Reed et al., 2010; Salet et al., 2013; Wyborn et al., 2016).

Over the past four years, we have done extensive research into the NSL. At first, our research focussed on investigating whether the NSL was able to accommodate both improved air quality conditions and new spatial and infrastructural developments (Busscher et al., 2014). After noting that NSL was largely unsuccessful in doing so, we concluded that a lack of learning and adaptation within the NSL was among the prime reasons explaining its limited success. This was a surprising conclusion, considering the NSL was explicitly organised for being adaptive based on ongoing learning. Subsequently, we continued our research with a focus on investigating this lack of learning and adaptation, with the ambition to explain why this lack occurred.

We started our investigation by addressing existing academic literature on learning and adaptation in the face of conditions of uncertainty. We report on this investigation in the following section, where we explain that processes of learning are far from self-evident and should be explicitly organised. It is a conclusion that is not explicitly discussed in much literature on adaptive forms of governing. After introducing our research methodology in the section Research approach, we continue with our empirical investigation of the organisation of processes of learning and adaptation in the NSL. The subsequent section focuses on how learning and adaptation was organised in the NSL and how it was supposed to occur, followed by reports on the learning and adaptation processes in practice. The final section concludes that the limited success of the NSL can indeed be partly explained by a poor organisation of processes of learning and adaptation. This also allows us to use this case to reflect on the theoretical idea of linking learning to adaptive forms of governance by suggesting such literature should explicitly pay attention to the organisation of processes of learning.

Coping with uncertainty

The rise of more adaptive forms of governance is among the prime reasons for the recent attention to processes of learning and adaptation in relation to conditions of uncertainty (e.g. Chaffin et al., 2016; Hodge and Adams, 2016; Kato and Ahern, 2008). Uncertainty is often considered with regard to stakeholder perceptions, their behaviour and how interaction between possible conflicting groups might result in different perspectives and choices. Different people and societal groups tend to have alternative and possibly conflicting perspectives on both the objectives to strive for and on the strategies for achieving them. In response to these uncertainties, planning theorists from the 1980s onwards have started to perceive rationality as a process of 'sense making' between contested interpretations, values and preferences different stakeholders hold on to (e.g. Dryzek, 1990; Healey, 1997; Innes, 1996). This debate has even dominated planning during the 1990s, culminating in what Healey (1992) coined the 'communicative turn'.

While the 'communicative turn' became a prominent response to conditions of uncertainty, a second response was almost forgotten in planning theory. This response relates to processes of learning and experimentation as means to try to reduce uncertainties with regard to the object of intervention, i.e. the material world in which issues are embedded. The idea is to try and improve the knowledge of the causes and consequences of planning issues and how policies might help to respond to them. This response to conditions of

uncertainty is based on a pragmatist line of thought (e.g. Dewey, 1920, 1929; Friedman, 1987) and focuses on experimentation in planning and policy making. Planning instruments and approaches are considered as experiments and, once applied in practice, need to be closely monitored to gain insight into whether and how these are successful in dealing with planning issues to trigger processes of learning and reflection.

In her paper, 'Coping with Uncertainty in Planning', Karen Christensen already hinted towards the need to use both routes to cope with conditions of uncertainty in 1985. On the one hand, she highlighted the importance of bargaining over alternative policy objectives (Figure 1, Line A). It is here where we find the need for 'making sense together'. On the other hand, she also highlighted the need for processes of learning and experimentation as ways to reduce uncertainties about the means to achieve agreed upon goals to try to reduce uncertainties (Figure 1, Line B). After 1985, the increased dominance of the 'communicative turn' almost concealed this second route. But the incorporation within planning and policy making of approaches related to complexity sciences (e.g. De Roo and Silva, 2010), soft systems thinking (e.g. Checkland, 2000; Checkland and Scholes, 1990), and social learning (e.g. Folke et al., 2005; Lee, 1993; Moulaert, 2013; Pahl-Wostl, 2009; Reed et al., 2010) is now producing a renewed interest in learning and experimentation. Furthermore, it is a renewed interest that seems to unite both routes mentioned for coping with conditions of uncertainty.

Learning pursued

Recently, a broad range of writings emerged on more adaptive forms of governance (cf. Chaffin et al., 2016). In adaptive forms of governance, organisations and coalitions use experimentation, monitoring and reflection through debate to increase their understanding of the practices they have to deal with. That is: coping with uncertainty is based on being able to adapt to newly emerging knowledge and ideas, where learning is the process providing the required input on creating such knowledge and ideas (e.g. Ahern, 2011; Brunner, 2010; Paavola et al., 2009). Learning, however, is now not seen as preoccupied with experimentation in the material world. Instead, learning is the result of a two-way process, where experimentation and monitoring help producing information about the

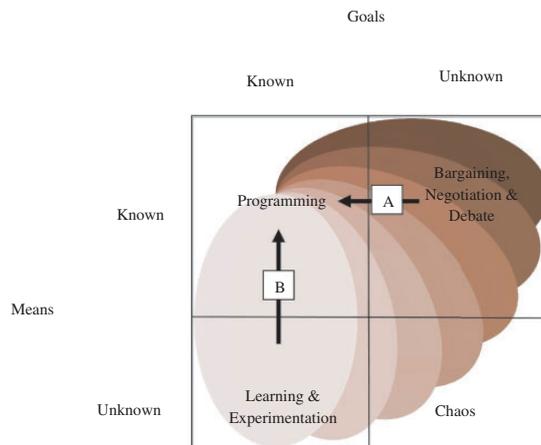


Figure 1. Planning approaches in response to uncertainty. Source: Christensen (1985).

effects of planning actions, while open communication and debate help establishing what this information means with regard to defining the problem, the policy objectives to pursue and the strategies to adopt (Figure 1, Lines A and B).

The rise of literature on adaptive forms of governance has brought the process of learning back to the forefront of academic debates in planning and policy sciences. Nevertheless, details on how we might proceed to learn and adapt often remain relatively general, while also modest use is made of literature of organisational sciences and of existing proposals for organisational adaptation and learning (e.g. Gupta et al., 2006; Levitt and March, 1988; March, 1991; March and Olsen, 2006; McGrath, 2001). We consider this modest use unfortunate, especially regarding the use of the twin-concept of exploration and exploitation for fuelling organisational learning as advanced by James March (1991). On the one hand, as also March and Olsen (2006) explain, planners and policy makers should focus on the exploration of new possibilities and on experimentation with new alternatives. This allows them to proceed from a better base of understanding on the effects of policies in practice and to sharpen predictions on how such policies can help to respond to planning issues. On the other hand, as March and Olsen (2006) argue, finding appropriate answers also involves the exploitation of existing capabilities – or as March (1991) phrases it: ‘the refinement and extension of existing competences, technologies and paradigms’ (p. 85). After all, if a planning approach proves to be successful in a specific context in space and time, this does not mean that this will also be the case in other contexts. The approach will have to be tested and refined to become more generally applicable.

Exploration and exploitation should be combined with each other to foster learning processes (March, 1991). Planners and policy makers focussing too much on the exploration of new knowledge and on developing innovative policy approaches risk overlooking the need for refining and adopting existing approaches so as to create efficiencies through routine operations. Rather, they might overflow decision makers with new ideas, options and learning opportunities, while many options have only been superficially explored and a clear frame of reference to interpret new findings is lacking. Alternatively, planners and policy makers also face the risk of focussing too strongly on exploitation, resulting in the premature acceptance that new findings make that issues are well understood and that the approaches used are equipped to deal with them. The result is not just that attempts to identify or anticipate changing or unforeseen circumstances are largely redundant; existing policies and programmes might also become increasingly rigid and inflexible to cope with such circumstances.

A synthesis

Combining exploration and exploitation can now be connected to the two-way learning process focussed on both experimentation in the material world and the inter-subjective realm in which different interpretations and values influence how learning takes place (see Figure 2). Firstly, experimentation with alternative planning actions, and monitoring successes or failure, helps us understand which technologies and actions within the scope of a programme ‘work’ (see Figure 2, Line B). Exploration comes forward in experimenting with alternative options, developing new options and evaluating which options work. In the realm of air quality policies, these could be options such as road pricing strategies, traffic management, improved air pollutant filters, attempts to influence the modal split, etc. Exploitation, instead, takes one strategy and aims to refine it, i.e. the alternative has been chosen and the attempt is to improve its effectiveness.

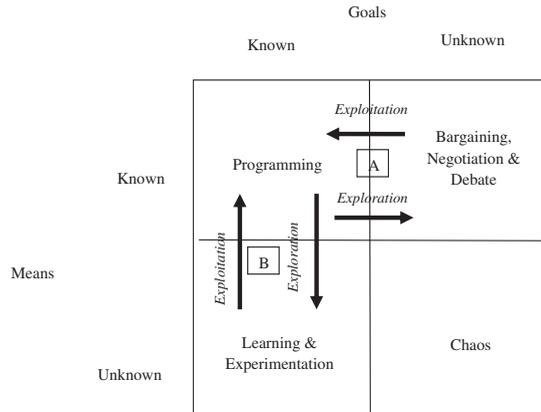


Figure 2. Processes of exploration and exploitation.

Secondly, learning also involves inter-subjective debate on interpreting and valuing newly emerging information in relation to problem definitions and policy objectives (see Figure 2, Line A). Exploration means the programme enables debates on the trade-off between objectives to pursue, the height of these ambitions and reflecting on the problem definition. In the case of air pollution, exploration might involve discussing the economic impact of strict air quality standards, or the gap between the strict WHO guidelines and the more lenient EU standards. Exploitation, instead, is focussed on fine-tuning the problem definition and programme goals. This might involve a refinement on the exact role of car traffic in contributing to air pollution.

Under conditions of uncertainty it is, however, unlikely that experimentation and monitoring will swiftly produce clarity upon which alternatives are successful, while conditions influencing success can easily change. Therefore, as Christensen (1985) also discusses, there is always the risk of ‘premature programming’, where ‘from a narrow set of alternatives, a particular proposed but unproven technology is selected, and then implemented through prescribed procedures and organisational mandates, as if the technology were already proven effective’ (p. 69). It is, to use our words, the risk that at some point in we forget explorative strategies that enable us to adapt, but instead create a lock-in of relying on only a narrow set of strategies that only allow for some degree of exploitation. As indicated by Salet et al. (2013), this risk is especially prominent when a policy or programme moves from one phase or decision-making round to another. They, for example, show how options enabling adaptation are present in early planning stages but quickly vaporise in implementation stages as a result of approaching deadlines and decreasing budgets. Moreover, these options are also no more explored as, especially during implementation, the tendency to simplify and revert to existing strategies increases. A new decision-making round may also emerge when the electoral cycles create a new political order and as a result shared knowledge, experience and memory disappear. In these circumstances, policy options that already have been explored and selected run the risk to be either forgotten or to be taken for granted and accordingly perceived as something that does not need political attention anymore (e.g. Jones and Baumgartner, 2005).

At the same time, under conditions of uncertainty, it is also unlikely that conflicting interpretations, values and preferences will easily converge to common perspectives, while changes are likely to occur over time. Consequently, Christensen (1985) warns us about ‘premature consensus’ where conflicting ambitions, priorities and programme goals are then

no longer considered as political choices and tradeoffs that need to be discussed and publicly debated, but simply ignored by curtailing ‘debates between specialties in such a way that each specialty’s goal appears acceptable’ (p. 70). In our words, the risk is now that we forget to reinterpret and adapt our objectives and definitions in the face of new information and ideas. This can occur when the parameters for debate are set in such a narrow way that there is little room for more fundamental discussion in which the existing perspectives on ambitions, trade-offs and choices is challenged. As discussed by Bickerstaff and Walker (2005), agendas for debate often reinforce rather than challenge existing power relations. This means that processes of learning, reflection and debate need not only have to occur in a communicative fashion, but also need to be organised in a way that it can ‘forcefully and repeatedly challenge [...] entrenched structures of authority’ (Tschakert et al., 2016: 192).

‘Premature programming’ and ‘premature consensus’ both describe situations in which exploitation is pursued at the expense of exploration. In both cases, learning is limited to optimisation of existing goals, instruments and knowledge. New knowledge about changed conditions, alternative trade-offs, or instruments is not searched for and, with a focus on optimisation, possibly even undesirable. As discussed above, such new knowledge, however, is exactly what is crucial if we want programmes as the Dutch NSL to be adaptive on the basis of an on-going learning process. To avoid ‘premature programming’ and ‘premature consensus’, the organisational setup of adaptive policies and programmes should ensure that learning will not be limited to exploitation, but also involves exploration. Examples include not only monitoring schemes helping us to gain awareness of the practical impacts of policies (Figure 2, Line B), but also agreements or contracts that oblige stakeholders to evaluate their course of action and rethink and revise their tools and objectives in the face of new knowledge or unforeseen developments (Figure 2, Line A).

Research approach

In our study of the NSL, we explicitly analysed how the process of learning and adaptation was organised. Most notably, we used our theoretical conclusions as input for our analysis, hoping that they might set us on the right path for explaining the NSL’s lack of success in adapting. The choice to focus on the NSL is informed by our surprise of its lack of success in adapting to new knowledge and changed circumstances, despite being meant to do exactly that. An on-going process of learning-by-doing should have enabled the NSL to adapt to ‘changed circumstances and insights that are likely to emerge’ (VROM et al., 2009: 24). In practice, however, adaptation within the scope of the NSL proves cumbersome (e.g. Busscher et al., 2014; EK, 2013; TK, 2014). To illustrate, even though the monitoring results show that the programme is not sufficient in reducing air pollution to the extent that was agreed upon (RIVM, 2014), the responsible minister still claims that ‘there is no need to re-evaluate whether the existing strategies to reduce air pollution are still adequate’ (I&M, 2013: 7).

In addition, though, we also used the NSL as a case to reflect on the current use of the notion of ‘learning’ within academic debates on more adaptive forms of governance. That is, next to our prime motive of trying to understand the NSL’s lack of success in adapting, we also mean to explicitly reflect on the theoretical arguments made in the section ‘Coping with uncertainty’. After all, the NSL can be seen as a ‘deviant’ (Flybjerg, 2006; Seawright and Gerring, 2008) or ‘negative’ (Emigh, 1997) case study: both its theoretically predicted outcome – that learning leads to adaptation – as well as its practical ambition – to adapt to changing circumstances – have not been realised. According to literature, deviant or negative case studies are especially helpful to probe new or additional explanations about

expected relationships. In this article, we will, therefore, also use the NSL to further our insights on how the organisation of learning processes influences the extent to which policies and programmes can adapt in response to uncertainty and changing circumstances.

Our study is based on an extensive set of sources: interviews, focus group discussions, policy documents and academic publications about the programme. The principle researcher has conducted qualitative, semi-structured interviews with open-ended thematic questions. All interviews were audio-recorded. The researcher also took notes during the interviews. The interviews have been worked up on the basis of both the recording and the notes.

The interviews took place in three different rounds. The first round of interviews was conducted in 2009–2010 in the early stages of working with the NSL. The interviews focussed on the development and organisation of the programme. In this round, 41 interviews were conducted with actors involved in the programme. This included public officials, consultants and lawyers involved in the development and implementation of the NSL. Most of them were specialists in air quality matters, although they had different backgrounds varying from technical issues as modelling and the dissipation of polluted air to legal aspects and process organisation. All of them were working for the Ministry of Transport, the Ministry of Housing, Spatial Planning and the Environment (merged into the Ministry of Infrastructure and the Environment in 2010), provinces, municipalities, supporting government agencies, interest organisations, or consultancy and law firms. In this round, interviewees were selected using a dual design of strategic sampling and snowball sampling. Key actors were identified through publicly available minutes of key meetings and conferences in preparation of the NSL, government issued policy documents and academic publications. Interviewees were also asked to others considered influential in the air quality *dossier*.

In 2011, in a later stage of working with the NSL, we followed up on 13 interviewees of the first round that held key positions; i.e. they were directly involved in drafting the NSL or implementing it in key national or provincial agencies. In this round, we reflected on how the programme responded or could respond to changed circumstances and contextual developments. We asked interviewees what they considered to be important contextual developments, whether and how these developments triggered any learning within the programme and if so, whether this triggered adaptations to the programme.

The last interview round was conducted in 2013 in the final stages of the NSL. In this round, 13 interviews were held in which we largely addressed the same aspects as in the second round. In comparison to the second round of interviews, however, this time we also asked stakeholders to evaluate whether the programme lived up to their expectations (formulated in the first round) and which factors had played a role in either confirming or contradicting their expectations. Furthermore, we also asked them to assess in a more general sense whether the NSL had been able to respond to conditions of uncertainty.

In the analysis of the interviews, we manually looked for overarching themes or patterns in the organisation, triggers and occurrence of learning. Key themes were identified based on their research relevance, how often a theme was mentioned, and the extent to which it marked differences between different (groups) of stakeholders (e.g. Salet et al., 2013; Tschakert et al., 2016) and were discussed by the researchers in the team. Although themes were primarily based on the responses of the interviewees thus following an inductive approach, we linked the themes that were found back to existing literature. As such, the analysis was based on a combination of an inductive and deductive approach (Hennink et al., 2010; Ritchie et al., 2013).

We found that although the NSL was ‘officially meant’ as an adaptive programme, in practice, it was used as an ‘excuse’ to simply postpone some of the solutions. To gain insight and reflect on how this was perceived, we also organised two focus group discussions. The first focus group consisted of participants primarily focused on road infrastructure development. They mostly needed the NSL to ensure they could continue with their projects. They originated particularly from *Rijkswaterstaat* – the executive agency of the Ministry of Infrastructure and Environment, which is responsible for the planning and construction of the national highway system. We used insights from the first focus group to stimulate the discussion in the second focus group. This group tended more towards seeing the NSL as a start for a ‘real solution’. It consisted of participants that were stakeholders involved in the implementation of the NSL and originated from law firms and national, provincial and municipal government organisations.

Coping with uncertainty in practice: The NSL

The NSL had a dual objective: ‘to improve the air quality and the public health and to enable the implementation of spatial and infrastructure projects’ (VROM et al., 2009). The programme was developed after European air quality standards, as specified in air quality directive 1999/30EC, were incorporated into Dutch law and it appeared that these standards were transgressed in large parts of the country. As a result, not only infrastructure projects from the Ministry of Transport could no longer proceed, also smaller projects on lower levels of authority – parking garages, new residential neighbourhoods, etc. – were halted.

The programme is based on a collaborative effort of those government organisations that were affected by the halting of spatial and infrastructure projects. These government organisations are the Ministry of Transport, the Ministry of Housing, Spatial Planning and the Environment (VROM), 7 provinces, and 195 municipalities. All these parties signed a contract that details the kind of measures each will take in the subsequent years to improve air quality. To illustrate, ministries agreed, *inter alia*, to implement a national road pricing scheme and erect barriers along highways, provinces agreed to clean up their car fleet, and municipalities agreed to encourage cycling, introduce environmental zones and implement strict parking policies.

These mitigating measures were assessed on the basis of a newly developed national monitoring tool. The monitoring tool showed that at the start of the programme ‘the set of mitigating measures [was] amply sufficient’ as an interviewed national policy officer explained. To monitor if implemented measures also would sort their anticipated effect in practice and to check whether all parties would do their share (VROM et al., 2009), monitoring would occur on an annual basis during the implementation of the programme. The monitoring results would be shown on publicly available websites (www.nsl-monitoring.nl and www.atlasleefomgeving.nl/kijken). To ensure that monitoring would occur on an independent basis, the National Institute for Public Health and the Environment (RIVM) was asked to organise and coordinate the monitoring process.

The contract that was signed by all involved government organisations also specified what was to be done in case the monitoring would produce unexpected results. It specified, for example, what was to occur in case some mitigating measures were failing. If this would happen, then involved stakeholders would investigate the situation in order to both interpret and make sense of the results, and assess to what extent the programme would suffice. In other words, the participants explicitly agreed that this would trigger a process of learning that would lead to adaptations to the programme. The organisation of

this learning process, however, in terms of mandate, division of roles and responsibilities was not specified. It was merely agreed that the success of the NSL was a collective responsibility and that in case of unforeseen circumstances, the involved actors would investigate to what extent current mitigating measures could be optimised or expanded (exploitation) or whether additional mitigating measures could be developed and implemented (exploration). In both cases, if additional action implied the need of additional funding, this was to be made available by the involved actors themselves following their own political decision-making processes; the initial budget of €1.5 billion that was provided by the Ministry of VROM had all been allocated. In both cases, also, experimenting with creating better ‘means’ within the frame of the existing NSL could take place without contesting the ‘goals’ – the scope and balance between the objectives of the NSL (Figure 2, Line B). The NSL, however, also allowed for individual projects to be removed from the programme, shifting the balance in its dual objectives (VROM et al., 2009). In doing so, therefore, the NSL did allow for its scope and dual objectives itself to be debated (Figure 2, Line A). With these possibilities, participants considered the NSL to be quite able to adapt and flex to changing circumstances. Based on the idea that programme found a way to unite the multiple interests at stake and would be flexible in the face of possible drawbacks, hopes were high that with the NSL the Dutch would be able to break the lock-in situation they found themselves in after implementing the EU Directive.

Learning in the NSL

The focus group discussions and the interviews show, however, that despite the high expectations, the implementation of the NSL ran into trouble. In both the focus group discussion and the interviews, it was mentioned that initially, in 2009, all stakeholders were confident that the measures installed would be sufficient to both realise infrastructure projects and meet air quality standards. In the course of time, however, the monitoring tool consistently showed disappointing effects of the mitigating measures that have been implemented. For example, in practice, the emissions of cars and trucks with a so-called ‘Euro 5-engine’ (a cleaner engine) emitted: ‘emissions of nitrogen dioxide that are three times higher than expected beforehand’ (Ligterink et al., 2009: 2), which left the major cities in the Netherlands faced with a serious challenge. On the basis of these disappointing monitoring results, it could be expected that – in line with the agreements between all parties – a learning process would be initiated that focused on investigating and assessing to what extent the current design of the programme still can sufficiently achieve the dual objectives of the NSL. Based on interpreting the results of on-going monitoring, stakeholders would first assess whether they needed to either alter or refine the scope and balance between the objectives of the programme (Figure 2, Line A) and secondly, to assess how to improve or expand the measures and actions taken (Figure 2, Line B).

Narrowing scopes

Faced with the disappointing monitoring results, it was indeed clear that those involved with the NSL were first facing questions regarding the scope and balance between the objectives of the programme. As a legal expert explains: ‘either the amount infrastructure projects that deteriorate the air quality is decreased, or the amount of mitigating measures that improve the air quality is increased’. The first option would imply stakeholders discussing the monitoring results so as to exploit possibilities to refine their understanding of what the NSL’s dual objective meant in practice regarding balancing air quality and constructing new infrastructure

projects, or possibly, to even explore whether the NSLs scope and dual objective had to be adjusted (Figure 2, Line A). This first option was not considered preferable. Instead, it became apparent that as a municipal policy officer explains: ‘almost everybody is participating in the programme in order to be able to build again’. Because the European air quality standards are also essential to be reached, the balance between the objectives of the NSL remained untouched. This is also reflected in the conclusions of a focus group discussion on ‘how to proceed’ where participants felt: ‘there is no room to discuss over the objectives again’. This conclusion was not just based on interests and choices of most of the NSL’s participants; it was also based on a changed political climate. The 2010 national elections significantly changed the Dutch national political landscape. The interviews revealed that the in comparison to the ‘Balkenende IV’ Cabinet in 2009, the new ‘Rutte’ Cabinets (both Rutte-I and II) were much more oriented towards spatial and infrastructure development to stimulate the national economy and much less towards its environmental consequences. Faced with a new political landscape, the VROM quickly realised that ‘the discussion on environmental policies would have to take place on the background as these policies might constrain the small economic growth that this Cabinet cherishes so much’. Complemented with a Ministry of Transport that quite clearly indicated that it was part of the NSL ‘to be able to construct our projects again’, the debate on the monitoring results was organised by the national government in such a way that discussions on how to interpret the monitoring results, on validating the degree of progress being made, and on making possible changes or additions to the NSL were marginalised. For example, when critical issues regarding the dual objectives of the programme were raised by the RIVM, the institute that independently performed the annual monitoring, civil servants of the Ministry of VROM criticised the RIVM for being ‘politically insensitive’ and accused them to ‘speak before their turn’ as mentioned by a national policy officer. This not only means that there was no room for exploitive learning regarding what the dual objective actually meant in practice, but that it was also not possible to explore the degree in which the NSL might have to be reframed in scope and focus (Figure 2, Line A). Instead, the agenda of the debate was limited by the national government and focused only on whether existing mitigating measures could be improved and expanded or whether new mitigating measures might have to be adopted. In response, as the focus group participants also noted, learning was confined to a focus on how to improve the ‘means’ for a successful implementation of the NSL (Figure 2, Line B).

Ensuring programme success solely on this basis, however, proved to be challenging. Decentralised governments as the municipality of Rotterdam, for example, were confronted with ‘transgressions of the environmental standards of over $8 \mu\text{g}/\text{m}^3$, while their most effective mitigating measure proved to be an environmental zone, which reduced concentrations with $0.1 \mu\text{g}/\text{m}^3$, as mentioned in the focus group discussions. In other words, the decentralised government agencies quickly realised that the only way to ensure that the European standards will be met everywhere in the Netherlands is to collaboratively take additional mitigating measures. On this, the decentralised governments particularly urged the central government to do more and adopt or stimulate the adopting of new mitigating measures on a national scale. It was essentially a call for national leadership in trying to stimulate the kind of learning upon existing and new measures and how best to implement them. Practice, however, would turn out differently.

Risks of failure?

The changed political landscape significantly influenced the NSL. First, it made that ‘the search for additional mitigating measures was greatly complicated’ as a national policy

officer explained in the interviews. This would require additional funding, while political priorities had shifted. Second, it also caused that important existing mitigating measures to be taken by the national government, such as a nation-wide road pricing, were annulled because political support for the initiatives had vaporised (e.g. Smaal, 2012). Furthermore, to add insult to injury, under the changed political leadership the decision was also made to increase the maximum speed on many highways from 120 to 130 km/h despite the extra air pollution this generates. Third, whereas the decentralised governments had hoped for the central government to step in and help the involved stakeholders to take more mitigating measures, they had ‘to conclude that the central government is merely undertaking counterproductive measures’ as a provincial policy officer put it.

Without the leadership of the national government, debates on improving, expanding or adding mitigating measures within the NSL further marginalised, creating what appears to be an ‘NSL fatigue’. As a policy officer from the Ministry of VROM explained:

We are a policy department. We initiate policies and programmes, we do not implement them. Creating elbow room during implementation by engaging in political debates is not something we enjoy. I have wondered many times why we, as initiators, are also considered to take the lead in the implementation.

Within this atmosphere, explorative learning on possible new measures was hardly pursued at all. Moreover, even exploitive learning upon how to expand existing measures and transferring successful practices to other places was limited. During the interviews, a national policy officer first of all concluded that the NSL ‘simply does not contain a structure for different participants to learn from each other’. When it is asked why there is no stakeholder initiating this, the interviews subsequently make clear that all stakeholders feel that the national government should organise this. At the same time, however, they also conclude that the department within the national government that should do so is primarily focused on ‘showing to the European Union that we are doing well’, while they also suggest that ‘they simply do not have the capacity to also explicitly facilitate learning processes’.

Without actively engaging in processes of learning from past successes and failures, most stakeholders in the NSL have started to focus on their own task and initiated processes of exploitation to optimise their own existing set of mitigating measures (Figure 2, Line B). The intention of individual stakeholders is to improve their own set of mitigating measures to such an extent that ‘they just meet the European standards in their jurisdiction and to cut all possible redundancy and slack from their set of mitigating measures to arrive at an optimal cost-benefit ratio’, as explained by a municipal policy officer. In this process, as is mentioned in the second focus group discussion ‘the monitoring tool prescribes what you can do and what you cannot do’. In other words, as another participant added, ‘to a certain extent the monitoring tool has become our reality’.

The learning now taking place within the context of the NSL is clearly marginalised. Centred on a monitoring tool that informs upon the degree of progress being made, learning is little more than adjusting detailed planning actions in ‘a numbers game in which we try to calculate concentrations of pollutants to several decimals behind the comma’. It has become something as ‘MoT testing an old car’ as a legal expert claims: when an old car runs into trouble in the annual test with regard to safety and road worthiness, owners typically try to

get it back on the road with as little investment as necessary. In a similar vein, monitoring in the NSL has become a matter of

ticking the boxes to show that we are on the right track. In case we cannot tick a certain box we first check whether this is not a mistake in the monitoring tool. If not, then the stakeholder who encounters the problem usually comes up with a stopgap remedy and hopes that it will hold in the next monitoring round.

This also means that ‘fundamental discussions on how to interpret these results are not being held nor do we reassess made agreements’. Hopes and expectations of an adaptive and flexible programme that would use a learning-by-doing strategy to be improved, therefore, are not the reality of the NSL. With the NSL, the Dutch hoped and expected to arrive at a situation in which the concentrations of pollutants in ambient air would be all below or even far below what the European standards prescribe. During the last interview rounds, this optimism was greatly nuanced: ‘we end up transgressing the environmental standards in almost all major cities in the Netherlands’ as a municipal policy officer denotes. As a result, as a provincial policy officer puts it, despite the tremendous efforts that the Dutch have made, it appears as if ‘we have ended up in just another lock-in situation’.

Discussion and conclusion

The stimulus of this article was our surprise about the lack of learning and adaptation within the NSL while the programme was explicitly organised to be adaptive on the basis of an on-going learning process. In this article, we aimed to explain why this lack occurred. Based on our findings, we can also reflect on how adaptive strategies can benefit from the learning taking place during their development and implementation.

If learning wants to support adaptive strategies and programmes, it should be organised focusing both on improving the knowledge of the effects of possible policy strategies and solutions in the ‘material world’ and on bargaining and negotiation in which we interpret and ‘make sense’ of such knowledge. In doing so, learning can benefit from two complementary processes, one focussed on exploring new ways to understand and approach problems, the other one focussed on exploiting existing knowledge, measures and capabilities by optimising and refining them. For policies and programmes such as the NSL, this means that these should allow for debates so as to make sense of new information and findings, and allow for a continuous interaction between exploitation and exploration. Otherwise, these policies and programmes run the risk of what Christensen (1985) referred to as ‘premature programming’ and ‘premature consensus’, which will undermine the capacity of a programme to adapt to changing circumstances. In retrospect, we can conclude that the NSL failed to anticipate both these risks and consequently also failed to adapt.

Our analysis reveals that debates after the monitoring tool showed disappointing results were soon marginalised and gravitated towards exploitation at the expense of exploration. On the one hand, the ruling political and administrative mind-set surrounding the NSL meant that sense-making, negotiation and debate was to take place within strict parameters. This limited learning and meant there was no room for explorative learning regarding the meaning of its dual objective in practice, nor regarding the degree in which the NSL might have to be adapted in scope or focus. This is a classic example of ‘premature consensus’, well illustrated by participants responses that ‘there is no room to discuss over the objectives again’. On the other hand, there was also limited room for explorative learning on possible new measures, while even exploitive learning upon how to improve and expand existing

measures was limited. Faced with a national government that annulled some key existing measures, most stakeholders refrain from any active exchange of knowledge and practices. The result is not only a 'NSL fatigue', but also that instead of the intended collaborative learning process, individual stakeholders started to focus on exploiting the measures already being part of the initial NSL, while putting most effort in optimising them so as to pass the 'sort of MoT test' the monitoring tool has become. The lack of leadership, fragmented learning process and short-term focus clearly undermined the capacity of the NSL to adapt to changing circumstances and demonstrate how NSL also suffers from 'premature programming'.

Because of the ill-organised learning process, the NSL has been unable to adapt to changing circumstances. This means it is now failing to comply with European air quality standards. This effectively leaves participants with two possible options. The first is to accept the situation as it is and face the possible consequences of non-compliance. This, however, is something that appears to be unacceptable to anti-pollution groups in the Netherlands. 'Friends of the Earth Netherlands' recently sued the Dutch government because the NSL is not living up to its promises. Early September 2017, the court ruled in favour of the anti-pollution group and forced the Dutch state to take action so as to ensure that the European air quality standards will be met everywhere in the country. This pushes the participants in the NSL towards the option, that is to initiate a fresh round of exploration; both with regards to the objectives of the NSL and with regards to its policy measures. Moreover, it also compels the Dutch national government undertake this under their leadership.

This, of course, could have happened much earlier already. The involved actors often considered the central government to take up the leadership role. However, through time, its actions have proved to be heavily influenced by changing political imperatives. The learning process was clearly limited, additional funding was not made available, and important measures were annulled. To safeguard the programme against changes in the political landscape, it might have been wise to appoint such leadership to a more independent organisation that is provided with the necessary tools and instruments to not only stimulate that learning takes place, but also to ensure that this occurs with regard to both experimentation and bargaining, negotiation and debate. Conversely, also the exact opposite strategy would have been an option. The NSL exhibits an indirect but influential relationship between politics, with regard to the decisions that new ministers made, and the ministries themselves. It shows how politicians can take counterproductive decisions with regard to a programme that the ministry tries to implement. Largely, this is a result of the fact that the ministers responsible in the different phases of the programme, i.e. the development, implementation and finalisation, will be different for each phase and thus political reliability becomes more elusive. Preventing this from happening would imply a much closer link between the consequences of political decision-making and political responsibility for the success of the programme. This, could, for example, be organised by linking annual budgets, to be made available to new infrastructure projects, to the annual monitoring. This would have urged the Dutch national government to a political debate that also includes discussing new tools and approaches as well as the objectives to pursue and choices to make.

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