

# Riding the razor's edge of science-policy interfacing: frame analysis in research and policymaking on climate adaptation

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## Abstract

Due to the various stakes, values and views of social groups involved with climate change and adaptation, the process of developing the Dutch National Adaptation Strategy (NAS) needs to take a plurality of frames into account. The PBL Netherlands Environmental Assessment Agency (PBL) aimed to inform this process using frame analysis. However, researchers at PBL did not succeed in applying the method as planned. Over the course of the production of the NAS, the hegemonic science-risk frame, which focuses on quantitative identification and subsequent prevention of risks, emerged as the dominant frame. Our case analysis based on participant observation and interviews shows that, even when frame-reflection was explicitly aimed for, this happened to be downscaled, unwittingly, under influence of tensions, challenges and paradoxes encountered during the essential balancing act that characterizes complex science-policy interfaces. Roles, interaction processes, client needs, internal processes are dynamically shaping and shaped by institutionalised expectations over objectivity, independence, inclusiveness and effectiveness. We argue that what makes frame analysis worthwhile is not so much its presupposed power to lead to the adoption of a multiplicity of frames, but rather its ability to lead to a form of institutionalized critique that refuses to take automatic recourse to a dominant frame (e.g. the science-risk frame). Thus, frame analysis is a crucial instrument in performing the aforementioned craft of science-policy interfacing, and needs to be more firmly integrated into science-policy interfacing for this very reason.

## 1. Introduction: climate change and pluralism

Within the scientific community, there is widespread consensus regarding the anthropogenic causes of climate change. The latest report of the Intergovernmental Panel on Climate change (IPCC) states that “[h]uman influence on the climate system is clear, and recent anthropogenic emissions of greenhouse gases are the highest in history. Recent climate changes have had

widespread impacts on human and natural systems.” (IPCC 2014b, 1) Cook et al. (2013) analyzed over 12,000 peer-reviewed scientific papers on the topic of climate change, and found that 97,1% accept this consensus position. These findings corresponded with similar studies of the scientific literature on climate change that were carried out earlier. For example, van der Linden et al. (2014) point to the studies of Oreskes (2004), Doran and Zimmerman (2009), and Anderegg et al. (2010).

Be that as it may, outside of the scientific community there is neither consensus about the causes and impacts of climate change, nor is climate change often seen as an urgent problem requiring immediate attention (Ekwurzel et al. 2011). Worldview rather than a scientifically sound underpinning determines the perception of climate-related risks (Stevenson 2014). At times tendentious reporting on climate science, for example during the ‘Climategate’ affair in 2009, in combination with more acute financial and geopolitical crises, does not bode well for the ability of scientists and policymakers to make climate change a matter of more general concern (Pielke 2005; Marquart-Pyatt et al. 2011). More generally, the perception of risks is not a rational matter, but involves a smorgasbord of societal factors (e.g. institutions, organizations, and networks of communication), political orientation, education, and cultural values that often differ from person to person (Kasperson et al. 1988, Renn 2008, Bohr 2014). As a result, there is no single perception of risks, but rather a multiplicity of risk perceptions. Thus, climate change involves pluralism due to this diversity in perspectives.

Societies can only be made more resilient to climate change when both policymakers and society more generally are motivated to collectively engage in adaptation and mitigation to climate change. For example, the consumption of energy and resources of households and their willingness to adopt climate-related policies are important factors in climate adaptation and mitigation (Porter et al. 2014). Attracting a more general public to the topic of climate change can sow the seeds for successful collective action. However, the aforementioned issue of pluralism points to dissensus rather than consensus, since there is a multiplicity of perspectives on the extent to which and how society should address climate change. Pluralism calls on the ability of climate scientists and policy advisers to cater to policymakers and citizens and their divergent way of perceiving risks (Akerlof et al. 2013).

In order to deal with pluralism in the context of climate change, frame analysis is practiced at PBL Netherlands Environmental Assessment Agency (PBL), a Dutch institute for strategic policy analysis in the fields of the environment, nature and spatial planning. Due to the various perspectives on climate change and adaptation, PBL aimed to include a plurality of perspectives on climate change in a policy analysis study that informed the development of the Dutch National Adaptation Strategy (NAS), a national agenda for climate adaptation. The development of the NAS policy analysis study involved a process of identifying the interaction between the various frames involved. In recent years, PBL has successfully conducted frame analysis to advance the debate on Dutch nature policy in its so-called Nature Outlook by illustrating how conflicts emerged from various frames. However, researchers at PBL did not succeed in applying the method as planned in the case of the NAS. Over the course of the production of the NAS policy analysis study, the hegemonic science-risk frame, which focuses on quantitative identification and subsequent prevention of risks, emerged as the dominant frame, seriously limited and even precluding the uptake of other perspectives on climate change.

In this paper, we analyze why frame reflection was resisted in the context of Dutch climate adaptation research and policy, and why frame analysis could not be successfully conducted

in the case of the NAS. The failed attempt to conduct frame analysis allows us to study the factors that shape the uptake of frame analysis at PBL. Thus, we deliver insights into the role of framing and its viability in transformative climate policy action. In our opinion, the dynamics in the science-policy contexts in which frame analysis is implemented are thus far not substantially discussed in studies of framing. Doing so could help implementation of frame analysis to become more successful, and thereby advance policy-making in the context of adaptation and mitigation to climate change.

Successful implementation of frame analysis requires comprehension of how the science-risk frame has become hegemonic, and how it shaped reciprocal relationships between research and policymaking in the area of climate change. More generally, frame analysis can indicate how and why a particular frame becomes established as the dominant frame informing climate adaptation, thereby limiting the uptake of a multiplicity of frames. Showing how dominant frames are established could enhance reflexivity in adaptation research and policymaking, and could lead to renewed attempts to include a multiplicity of perspectives rather than adopting the perspective of a relatively exclusive community. Cultivating such forms of reflexivity, we argue in more detail below, could prevent hegemonic frames from becoming de facto dominant perspectives without researchers and policymakers being aware of this. Although being aware of the hegemony of a particular frame does not guarantee the uptake of a multiplicity of frames, it would continue to stress the need for a more diverse repertoire of frames. Thus, researchers and policymakers are reminded of the fact that enhancing society's resilience to climate change requires catering to specific sentiments in society that are not addressed by the science-risk frame.

## 2. Methodology

In order to identify the characteristics of the research and policy context at PBL, we conducted participant observation and interviews on framing in the case of the NAS with seven actors, including PBL researchers responsible for the project (3 respondents), policymakers of the NAS (2), the PBL director (1) and a scientific expert (1). The aim of these interviews was to address how frames become routinized and institutionalized in the form of habits of thought and action, and thereby end up precluding reflection on particular frames. We used an open interview format in which we asked interviewees to identify the frames that emerged during the process and factors affecting the uptake of frame analysis. We, the authors of this paper, were both affiliated to PBL when this research was conducted. Although we were very much part of the PBL processes of science-policy interfacing we identify and describe in the following, we do not think this implies an insurmountable bias in our view of frame analysis. By articulating our perspective on frame analysis, we demystify the practice of frame analysis from a position that underpins policy documents on climate adaptation, but is usually rendered invisible. Thus, our writing forms an attempt to demonstrate how frame analysis takes place in practice. This involves describing the various perspectives on climate change involved, rather than clinging to one particular such perspective and ensuring that as many perspectives as possible are rendered visible. Our qualitative analysis of the interview transcripts reveals the process of framing (section 4.1) and the factors affecting the uptake of frame analysis (section 4.2). Our analysis findings stress the tensions, challenges and paradoxes implicated in the balancing act of science-policy interfacing, herewith challenging the presumption that framing contributes to more effective, inclusive policy making in a pluralist climate change policy arena marked by a multiplicity of frames.

### **3. Frames and framing in the climate change policy arena: understanding multiplicity through frame analysis**

#### **3.1. Definition of frames and framing**

According to Goffman (1974), a frame organizes experience and provokes action:

“When an individual in our Western society recognizes a particular event, he tends, whatever else he does, to imply in this response (and in effect employ) one or more frameworks or schemata of interpretation ...[which] is seen as rendering what would otherwise be a meaningless aspect of the scene into something that is meaningful.” (Goffman 1974, 21)

Frames are not so much descriptions of mental content or state of mind, but rather “principles of organization which govern events – at least social ones – and our subjective involvement in them.” (Goffman 1974, 10) Deborah Shmueli defines framing as “a cognitive process whereby individuals and groups filter their perceptions, interpretations and understandings of complex situations in ways consistent with their own socio-political, economic and cultural world views and experiences.” (Shmueli 2008, 2048)

In the light of the foregoing, frames have the important role of shaping perceptions of risk, since they act as “schemas of interpretation”, that consist of

“the conceptual images, values, starting points, and mental models that one may have of an issue. This can include, for instance, one’s problem definition, perceptions of the cause-effect relationships in an issue, one’s primary goals, perception of one’s and others’ roles and responsibilities relating to the issue, and views on suitable strategies and interaction with (other) stakeholders.” (Wardekker et al. 2009, 7)

Frames inform the actions of social actors, how they interact with other social actors, and how they view a particular risk (Ibid., p. 9). Due to their unconscious use, the impact of frames on our worldview and interaction with others may remain hidden. However, frames can also be used more strategically in order to connect groups of social actors that each subscribe to different frames. There is no overall frame as social actors have different frames that often partially (or sometimes not) overlap. It also appears that frames determine to a large extent how society chooses to act in the face of climate change

#### **3.2. Frames and framing in climate change policymaking: improving policy inclusiveness, effectiveness and communication**

There is a possibility that certain frames become dominant over time. In such cases, making such frames explicit may articulate value orientations: “[e]xplicit consideration of framing is also likely to influence the types of adaptation options and ‘pathways’ considered.” (McEvoy & Fünfgeld 2011, 5). Especially in the case of frames that are taken for granted and that also inform policy to a large extent, it is important to make frames explicit (de Boer et al. 2010, 502). It is also possible that fundamental aspects of adaptation and mitigation strategies, such as their purpose and the means, remain underexposed when frames remain implicit. The explicit naming of policy aims can increase the success rate of measures aimed at adaptation and mitigation, for example by identifying problem owners and managers. Framing and reframing thus lead to inclusive policy, since the plurality of climate risks can better be acknowledged: “Through framing, implicitly or explicitly, particular interests are advocated or undermined, power positions are maintained or challenged and particular actors are included or excluded from policy debates.” (Dewulf 2013, 322)

Framing and reframing can also lead to more effective policy. Adaptation and mitigation include a variety of measures which correspond to various goals and desires. It is important to meet the specificity of climate risks for particular groups of people and the local impact they have. By means of framing, policy can become more effective because it becomes clear how and why of adaptation and mitigation need to be implemented. What is more, the parties involved become able to better understand each other. Finally, responsible parties and problem owners can be identified (Collins & Ison 2009). In this regard, McEvoy and Fünfgeld (2013) mention 'adaptation paths' that can be connected to concrete and topical issues by means of framing and reframing:

“[a]daptation pathways should not be seen as a static entity. Rather, to be effective they will need to involve a constant re-framing of issues as new information and knowledge becomes available. This highlights the importance of understanding adaptation as a continuous process of social learning among the diversity of actors involved.” (Ibid. p.7)

Nisbet (2009) places framing in the context of failing communication about climate change and defines frames as “interpretive storylines that set a specific train of thought in motion, communicating why an issue might be a problem, who or what might be responsible for it, and what should be done about it.” (Ibid. p.15) By reframing risks, the values and perspectives of various social groups can better be accommodated in policymaking, making climate change a more relevant and comprehensive issue in ways that are more appealing and familiar to the various target groups (Ibid. p.14). This is important, since many social actors tend to ignore climate change, which is due to its perceived complexity, uncertainty, and lack of direct impacts (Ibid. p. 15). Communication about climate risks needs to connect with the audience’s “preexisting interpretations”, which consist of “personal experience, partisanship, ideology, social identity, or conversations with others.” (Ibid. p.16-7)

### **3.3. Understanding multiplicity with frame analysis**

Frame analysis supposes a pluralistic universe; the world of policy is intrinsically contested, contingent and indeterminate (Wagenaar 2011). Frame analysis can help to affirm the multiplicity of climate change, since this is not an issue with a single meaning but rather one replete with a variety of interpretations and corresponding values.

Pielke (2005) argues that a strict definition of climate change has led to a societal and political impasse, leading to a lack of measures related to adaptation and mitigation. The public debate about climate change has largely focused on the question whether it has an anthropogenic origin, rendering adaptation and mitigation a much less visible topic of discussion (Ibid. p.558). In addition, climate change is highly laden with political values that emphasize short-term gains. Instead, longer-term effects need to be studied on a geopolitical scale in a study of “the interactions of climate, society, and environment in ways that lead to vulnerabilities (as well as opportunities) in local and regional contexts, rather than at global scales ... Science would thus place itself in role of being a tool for policy action rather than a tool for political advocacy.” (Pielke 2005, 559) In other words, putting climate change on the political agenda is not so much a matter of producing new knowledge, but a question of delivering a new perspective: “[m]any failures in problem solving result not from the lack of appropriate knowledge but from the inability to recognize when that knowledge is appropriate to a new situation. (Wardekker et al. 2009, 27) Because framing shapes the perception of climate

change, an improved understanding of frames, through frame reflection, can yield better alignment between policymaking and the concerns of social actors.

The public debate on climate change benefits from the use of different frames. When problems with high uncertainty are negatively framed by emphasizing potential losses, the willingness of social actors to live in a more sustainable manner (for example by investing in renewable energy) decreases. However, when problems with high uncertainty are combined with a 'positive' frame that focuses on opportunities for avoiding potential losses, the willingness to live in a more sustainable manner will actually increase. In creating perspectives for action, a great deal of uncertainty is not necessarily an insurmountable barrier. Framing can help to communicate uncertain problems in such a way that the will to act is not undermined (Morton et al. 2010). Discussions about risk may benefit from contrasting frames and challenging stakeholders to reflect on their own frame (s) and that of others, which builds "frame awareness" (de Boer et al. 2011, 5).

In view of the issue of pluralism in climate research and policymaking and the multiplicity of frames on climate change and adaptation, public and policy deliberation may be supported with frame analysis.

The founding father of value-critical policy analysis (Rein 1983; in Wagenaar 2011) identified three applications of frame analysis. First frame-criticism, or the elucidation of the taken-for-granted assumptions of policies and context that nourishes these assumptions. In other words: frame analysis may inform the diagnosis of the problem through the selection of legitimate viewpoints and the exploration of definitions of alternative courses of action, and lay bare the prescriptions for how the problem should be addressed. Frame-criticism may reveal the deterministic forces of the science-risk frame in status quo practices, values and assumptions (Blue 2015).

A second application is frame-creation which consists of a systematic critique of a particular "framework of action" because of its failure to deliver on its implicit moral promise, followed by the development of an alternative framework. There is a transformative element to frame creation: issue and action frames are deliberated to enable social learning about a range of frames not just those supported by dominant institutions or by one's own social group.

A third application is the redefinition and integration of frames to make them compatible. This application has a strong transformative connotation. The political imaginary promoted is one in which diversity is embraced, whereby all relevant issue and action frames, including those promoted by researchers, policymakers and civil society organisations, are approached as partial and contingent rather than generalizable and universal. By encouraging a diversity of frames to come to the fore to inform decision making and social learning, frame analysis provides viable, but by no means guaranteed or conflict-free venue for public deliberation and social change (Blue 2015).

Frame analysis is not a neutral activity since it is always accompanied by normative choices that have political consequences. There is no neutral frame that is objective, precisely because frames always shape the perception of a phenomenon by emphasizing certain aspects of a phenomenon. An understanding of frame analysis and its role in practice is therefore essential: "[t]ruth must be framed effectively to be seen at all." (Lakoff 2010, 80).

## 4. Frame analysis at PBL: dynamics at work in PBL’s study of the Dutch National Adaptation Strategy

### 4.1. Frame analysis at PBL: does it fit?

PBL has successfully conducted frame analysis to advance the debate on Dutch nature policy in its Nature Outlook, conducted from 2008-2012, by illustrating how policy conflict emerged from various frames on nature-human relationships. It serves as an exemplar for frame analysis in PBL context; several respondents made reference to this study when discussing frames and framing in our case setting. PBL had been successfully opening up the dominant ecological development discourse in the Dutch nature policy arena to pluralism by revealing the multiplicity of views on nature-human relationships, using normative scenario design as a method for frame reflection. The challenges encountered in this study had been to deal with epistemic diversity within the research group and to accommodate changing issue and action frames in the policy and public setting of nature policy arena. Hence, indicating the importance of factors affecting the uptake of frame analysis in this study (Kunseler et al. 2015).

A similar ambition of frame-reflection served as starting point for a policy analysis study on the Dutch National Adaptation Strategy (NAS). The project leader of the Nature Outlook study indicated why this ambition fitted so well to the topic of climate adaptation:

*“One of the reasons that I like to work on climate adaptation was its broad topic area, whereas I had been working on nature policy in the past, and exactly because of the framing aspects. My image of nature policy is that it still confines to the worlds of policy and science, and that framing is strongly determined by the science. Strongly technological, technocratic-oriented. And I perceived this as a parallel with what I had been doing in the past, the nature outlook. And if you move from the nature outlook to climate, the use of multiple frames is self-evidential.” (respondent 4)*

Table 1. Anchoring a frame in the PBL study for the Dutch National Adaptation Strategy (NAS)

| <b>Frame attributes</b>     | <b>NAS frame</b>                      | <b>Risk repertoire</b>   | <b>Windows of opportunity repertoire</b>                             |
|-----------------------------|---------------------------------------|--|--|
| <b>Issue frame</b>          | Climate change is happening           | Water safety is principal concern; yet risks extend to other issues like energy, infrastructure, ICT | Sense of urgency to act upon climate change-related risks is low     |
| <b>Causal frame</b>         | Human beings influence climate change | All sectors and domains are affected by climate change-related risks                                 | All sectors and domains are affected by climate change-related risks |
| <b>Responsibility frame</b> | Top-down, multi-actor steering model  | Climate adaptation is a multi-sector, multi-actor responsibility                                     | Climate adaptation requires new actor coalitions                     |

|                     |   |  |   |
|---------------------|---|--|---|
| <b>Action frame</b> | Adaption is essential;<br>Mitigation is essential | Sector-specific adaptation pathways as policy strategy | Upside down thinking ('omdenken') as policy strategy: focus on mainstreaming, co-benefits and integration |
|---------------------|---|--|---|

Despite its frame-reflective ambition, the study turned out to strongly link up to the policy frame advocated by the Dutch National Adaptation Strategy (NAS). We entitled this frame as NAS frame. The frame attributes, introduced by respondent 3, relate to problem definition (issue frame), causation mechanism (causal frame), responsibility structure (responsibility frame) and solution orientation (action frame), which are specified in table 1.

According to the respondents the NAS frame is firmly embedded within Dutch climate adaptation research and policy e.g. some refer to the Dutch climate agenda (Rijksoverheid 2013) as the central policy document. Yet, as pointed out in previous sections, its hegemony in scientific and policy worlds is sturdy and extends the Dutch arena; the frame has a strong scientific connotation and advocates a technocratic approach. In consequence, the prescriptive nature of this frame largely goes unnoticed as it is covered under scientific language and descriptive stature of the scientific method. Also the PBL study is dominated by a scientific orientation to risks and uncertainties, which unwittingly goes hand in hand with the underneath prescriptive assumption that action is needed.

The respondents refer to two co-existing repertoires under the NAS frame that emerged during the process: a risk repertoire and a windows of opportunity repertoire. A shift from the former to the latter repertoire is notable during the process of conducting the study, indicating how framing was enacted from the belief that a focus on opportunities would increase the effectiveness and inclusiveness of the NAS policy process :

*"... selling your product of course involves framing. The latter plays a role, when addressing opportunities and risks, particularly in the policy world. They tell us: it can be truth that numerous risks affect the Netherlands, but I do not get my minister enthusiastic about this. So if you are able to translate those risks to opportunities... you frame it rightfully, this way attaining a sense of urgency and political attention. And according to policy you should aim for this, otherwise your report disappears into a drawer." (respondent 4)*

Yet, the two repertoires are essentially connected as one justifies the other, and vice versa; this way firmly anchoring the overarching NAS frame during the course of the study. The repertoires are presented in part I and part II of the report. Part I is risk oriented; it contains descriptive analysis of physical climate change-related risks, which is largely grounded in expert judgements, and offers quantitative information in overview tables. The information is gathered with technical studies (including contract studies with knowledge institutes, consultancies, universities).

Part II (from chapter 4 onwards) addresses windows of opportunity for tackling climate change risks by various actors, sectors across a range of domains including several unusual domains in the climate change arena, like ICT, infrastructure, energy. It shows how in addition to

physical risks, there are risk perception and policy legitimization issues, urgency and agendas that need to be taken account of. The analysis in part II is largely derived from governance studies (contracted with universities) and inhouse expert judgement.

The messages the report conveys combine both repertoires: the assessment of risks in part I underpins the need for action, conveyed through the positive language advocated by the windows of opportunity repertoire in part II, pointing out that new actor coalitions have to collaboratively engage in climate adaptation actions; agendas need to be liaised; responsibility structures are to be made explicit. In short: upside down thinking (*'omdenken'*) enables climate adaption to be framed as opportunity, instead of risk – even though risk analysis provided the point of reference, yet framed as opportunities it is more attractive to non-usual subjects in climate adaptation, being more inclusive and effective this way, expanding the community to sectors like ICT, energy, infrastructure.

#### **4.2. Dynamics informing the frame analysis approach in PBL study**

In conversation with respondents several factors affecting the uptake of frame analysis – were revealed, accordingly demonstrating the tensions, challenges and paradoxes emerging in the balancing act between innovation and policy relevance; opening up and closing down. Revealing these factors allows us to explain the shift described in the previous section from the initial frame-reflective orientation to alignment to the dominant NAS frame over the course of the PBL study. We grouped our findings under several sub-headings which emerged as influential factors in our qualitative analysis.

##### **Role PBL**

Respondents often touch upon the role of PBL when explaining the approach to frame analysis. They illustrate the implicated tension in PBL practices between processes of opening up policy to alternative perspectives and views and processes of closing down i.e. alignment to dominating policy frames. One respondent illustrates this tension when asked to describe PBL's role in frame analysis:

*“You can also consider it a task of a planning bureau to demonstrate implications of actions and patterns of thought. But this discussion already runs for decades of course. You want to connect to the information needs of government, but you also want to address it more broadly. They have a particular question, but is that the question they should ask themselves? You want to challenge the policymaker in this respect. Not necessarily in a persuasive manner, but by offering additional considerations.”* (respondent 3)

‘Shaking up’ policy makers to broaden their perspectives, without foresaking the scientific nature of PBL work and according need for objective analysis is the core challenge. Objective analysis is perceived of as PBL's core task; which is interpreted by a respondent as the task to offer overview e.g. on the nature and severity of risks or on the implementation of local adaptation actions; while prioritisation or action implications is considered a matter of (local) politics. Application of frame analysis according to scientific standards is considered essential to assure PBL's credible and legitimate position at the science-policy interface. Are the two aspirations (broadening up perspectives and scientific work) compatible? Yes, respondents say, but only when: (i) the application of frame analysis is confined to frame-criticism to prevent being accused of a prescriptive, normative attitude, and (ii) PBL puts the existing / current policy frame center stage

(i) In the literature review three applications of frame analysis were distinguished; frame-criticism, frame creation and the redefinition and integration of frames (Rein 1983). A quote of respondent 5 strikingly illustrates that he only considers the first application suitable for PBL.

*“Now, should we...? Are we the planning bureau of ‘framing’? You can demonstrate who recognizes her or himself in a particular language for example, and if policy really wants something, than policy should go ‘framing’, but I don’t consider this something for a science... You can say: “If you address climate adaptation primarily in terms of water, you do not include this and that ‘constituencies’. And if you talk to this and that person, on the contrary, disruptive effect, sort of ‘cascading’, that would be marvelous in my view! It starts with something, but due to some sort of complexity, domino dices collapse. Others get involved. This is what we can illustrate. If policy is going to say: “We should communicate this???” Yes, I am not sure. I don’t think so, don’t know... should we aim for that?” (respondent 5)*

The first application, frame-criticism - elucidating taken-for granted assumptions of policies and the context which nourishes these assumptions - seems to suit the PBL task in view of this respondent: PBL can demonstrate how the current frame may have a cascading effect. But how far PBL should go in exploring, articulating and 'promoting' the actions and consequences implied in alternative frames – thus, engage in frame creation - raises question marks. Same goes for the third application of redefinition and integration: "should we aim for that?" Another respondent refers to a nature organisation to illustrate how integration of frames is part of their strategy to seek connectivity to new actor groups. For PBL, the action-orientation implicated in frame analysis seems to be problematic, as it requires PBL to cross a well-maintained boundary between descriptive analysis and prescriptive analysis. While Rein (1983) emphasises that frame analysis includes both: "once we have a prescription for action, we can identify the ensemble of beliefs, information, values, and aims that uniquely informs that particular action preference" (99).

(ii) Another issue of frame analysis in view of PBL's role is that its position as government-funded independent agency warrants its strong pre occupation with governmental, top-down frames; the NAS frame in this case. As one respondent puts it:

*"PBL is always inclined to work top-down, while the challenge [for climate adaptation policy] would be to explore whether local policy actors are inclined to collaborate." (respondent 2)*

The study/ report is therefore perceived of as rather traditional; supportive of the top-down NAS policy trajectory, highlighting urgency and need for action across actors, sectors and domains, but justifying the position of a government that is strongly on tap.

### Type of study

Respondents explain that the NAS policy analysis study was on request of the Ministry of Infrastructure and the Environment who acts as coordination partner of the Interdepartmental working group for the National Adaptation Strategy. The PBL study may inform the policy formation stage of the National Adaptation Strategy. It serves as a conceptual study or synthesis study as it gives an overview of and insight in attributes of climate risks (magnitude; severity; urgency; perception) and indicates hands-on strategies and policy options. The objective analysis of risks is perceived as the strength of the study;

respondents refer to the three tables summarizing the risk analysis findings in part I of the report. Its success resides in its relevance to the policy formation process: the study challenges the traditional water-focused climate risk frame underpinning climate adaptation policy by extending the risk analysis to other domains and sectors.

Discussing frame analysis in view of the purpose and characteristics of this policy analysis study reveals a dilemma: how to balance the need for policy relevance with the study's ambition to trigger policy innovation? This dilemma seems to be acted upon in favour of policy relevance, marked by strong alignment with the policy frame. Even though the initial ambition was to engage in perspective-exploratory work to identify the multidimensionality of climate related risks, the storyline of the report is traditionally risk-minded. The desire to strongly affiliate to the policy request and policy trajectory of the NAS, in combination with the short one-year timeline of the study, are highlighted as motivations for alignment to the NAS frame:

*“And we also discussed it with the client.. and he was actually very anxious that if we would bring in all kinds of new frames..., he thought, maybe that exactly would eh.. what we now chose and developed eh.. obstruct rather than eh.. eh.. be of support. So, then at a certain moment we said, well, we just take the frame of the national adaptation strategy and.. hey, what surrounds it, just what I said, as eh.. a point of reference.”* (respondent 6)

Towards the end of the report, the risk repertoire is replaced by a windows of opportunities repertoire; which may be perceived of as a frame-critical attempt to extend the risk frame, or perhaps as a frame-creative effort to develop an alternative frame. Risks are assessed in view of situational / contextual aspects and systemic properties, to point out the adaptive capacity of sectors and domains. It seems, however, that its scientific identity prevents PBL to engage in truly innovative frame-creative efforts; which indicate that the dilemma is embedded in PBL's position as scientific government agency; can boundary organisations be innovative at all?

*“Respondent 7:... they don't ask eh.. Berenschot [name of Dutch consultancy], but they asked for PBL, say, and I think that it is grounded in this eh.. thought that we also took a traditional scientific approach. BUT eh.. that is just my estimate.*

*Respondent 6: No, that's right. No because I mean eh.. they just asked that and it was also the Parliament eh.. when the NAS, yes but how about the risks? Enneh.. the ministry has spent about four hundred thousand to eh.. those different actors, like TNOs [Dutch knowledge institutes] to prepare those updates and next eh.. we [respondent refers to persons x and y] put considerable effort in getting that into a table, or in three tables actually. But that was the explicit question eh.. try to.. and we chose to..*

*Respondent 7: Well, it was a logical way, you first ask about 'what' before you can get to the 'how'. Nah you want...*

*Respondent 6: to have a sense of..*

*Respondent 7: You want to have an idea of order of magnitude: big and small issues. What should I do and what should I not... “* (respondent 6 and 7)

This quote illustrates respondents explaining the scientific orientation of the study; revealing a postivistic epistemological presumption that facts (i.e. what are the risks; that is their

magnitude) can be separated from actions and values (I.e. how to deal with risks). Another respondent draws on the scientific argument to justify why the risk repertoire is central to the study instead of the windows of opportunities repertoire: it is difficult to scientifically underpin windows of opportunities, e.g. are cobenefits effective and inclusive?; is mainstreaming of climate adaptation in sectors and domains effective? While it requires case-specific governance analysis to address those questions, it seems that PBL is not specialised in this type of research and, according to a respondent, should outsource, rather than try to conduct this type of research inhouse. Interestingly, the respondents views on risk analysis as a generic, objective activity precludes a truthful and valid application of frame analysis, since – as we already concluded in the previous paragraph - an appropriate use of this method is impossible if one presumes the disentanglement of values, actions, facts.

### Client needs

The client of the PBL study - the Interdepartmental working group of the National Adaptation Strategy – is challenged with the task of organising convergence between stakes, ambitions, responsibilities of government departments, representing a variety of sectors and domains, into a single strategic document on climate adaptation. A Respondent indicates that the PBL study, in order to support this process, should facilitate conversation between departments, sectors and domains by suggesting a basis for common ground (i.e. a shared frame). Instead of an alarmistic frame – which in view of this respondent PBL inclined to promote in the past, the client is in need of positive frame that implicitly feeds the sense of urgency for climate adaptation action:

*“If you cannot realise an approach via the perspective of urgency, if there is no support of, while you know it is serious matter, I think you should better approach it via the perspective of opportunities. You can show there are opportunities to adapt to, those we already have to or should, that it is useful to adapt to them. It becomes more pragmatic this way, the report less alarmistic but let we be happy about that.”*  
(respondent 1)

Discussing frames and framing in view of clients needs reveals an interesting paradox: while the limits to top-down working are well known, and a reluctance towards this model is notable among respondents, the policy design of the NAS and position of the PBL study herein is nevertheless defined by a top-down approach. The clients seek for a frame that triggers actors to engage in climate adaptation; assuming that their actions can be steered towards an adaptation modus. Exemplary is the structure of the NAS document: besides a long-term ambition, the NAS includes agendas that are to be formulated by the engaged sectors and domains themselves. This way, aiming for triggering problem ownership and sense of urgency. Hence multiplicity is allowed, yet within the construct of the NAS frame on climate adaptation. Moreover, actor coalitions and bottom-up initiatives are identified as crucial drivers for the windows of opportunity repertoire, yet with the role of government as 'steering' facilitator who identifies the gaps in knowledge and addresses their behavioural motivations. It is therefore not surprising that conversations initiated by the client hardly trigger local action and are dominated by a focus on fixed (top-down) agreements, as one respondent complains.

### Interaction

Reflections upon the process of interaction with the client (the NAS working group) also reveal how PBL researchers inclined to align with the NAS frame. The policy relevance of the study

was considered of utmost importance; and presenting an attractive, suitable frame therefore crucial:

*“I experience a considerable distance between the theory of framing and the daily struggle with policy people to make it all clear to them. So I was regularly worrying about: how do I translate this theory to what they can understand while they don’t want it to become more complex than it already is. That is a struggle.”* (respondent 4)

We can conclude that it is therefore framing, rather than frame analysis that occupied the PBL researchers over the course of the study. Implicit in framing are personal preferences and assumptions. PBL once presented the risk tables in the working group without leaving much room for debate which indicated the rather prescriptive inclination of PBL to promote the scientific uncertainty frame. Interestingly, the challenge that emerged during the interaction process was to change the mindset towards a windows of opportunities frame with mainstreaming and integration as attractive frame attributes.

*“That upside down thinking [omdenken] has been one of the most important developments during the process. It means for example that all research conducted on climate adaptation is discovered by people with an interest in climate. An alderman with a social agenda does not get there.”* (respondent 4)

This frame critical attitude among both researchers and policymakers involved emerged during the interaction process, particularly in response to difficulties and challenges experienced during the policy process with sectors and domains who demonstrated low sense of urgency. The importance of the PBL study as a broker in seeking connectivity to actor groups to facilitate policy support and understanding was a primer driver for innovative frame creation; yet, the upside down thinking' strategy of the windows of opportunity repertoire was embedded within and emerging from the language of scientific risks and uncertainties; therefore remaining rather implicit in the report text:

*“If you explore the text of the report you see elements of different perspectives, if only in the title of a paragraph “Climate adaptation involves more than just computing”. But the room for perspectives simultaneously remains implicit and hidden. I believe this has been the best solution eventually, because besides the report I attach even more value to the policy interaction process. And there you see that the working group has started to accommodate framing and perspectives. ”* (respondent 4)

Besides intense interaction with policy counterparts, the study has benefited from an interaction process with scientific counterparts as well, in the form of subcontracting. Although the risk frame was most familiar to the collaboration partners, also several collaboration partners with expertise in adaptation governance and process management where subcontracted to help shape the windows of opportunity frame, this way filling up the gap in knowledge and expertise among PBL researchers; and helping to open up the process to frame alternatives. Due to the marginal importance of this track, it did however not trigger frame constitutive implications.

### Internal process

Our analysis findings in the previous paragraphs reveal that the PBL research process and the NAS policy process are firmly embedded in the top-down technocratic approach that marks the hegemonic scientific uncertainty frame to climate change and climate adaptation. In this respect, the steps in the direction of frame criticism and frame creation can already be

perceived of as considerable efforts. Respondents also mark the challenge and effort to apply frame-analysis:

*“In that sense I feel at home, although I experienced serious difficulties in the beginning to allocate framing. Because there are different levels, and people who are close to climate research, they experience it already as a considerable step if not alone that angle of water safety, but also, say, community health is addressed under the heading of climate change. So, this has already been a considerable step.”*  
(respondent 4)

While the shift towards a windows of opportunity repertoire has been perceived of as step 'away' from the traditional risk orientation, respondents simultaneously acknowledge that this step had not been enough to make a difference, e.g. it did not bring innovative action perspectives or trigger social learning/ interaction processes among groups of actors. One respondent hypothesizes how PBL could truly facilitate interactive policy processes when using participatory design approaches. Yet, he emphasises that PBL should always approach this task acting as independent knowledge broker:

*“If we want the design approach to allocate space – what would it mean for our role as ‘knowledge for policy’ and what kind of issues should you deliver so that those folks, who are out there in the mud have good access to our specific knowledge?”*  
(respondent 5)

Another issue of attention in view of internal processes is the availability of free space. The ambition of the project to broaden up perspectives on climate adaptation was considered too extensive for the short time period and policy orientation of the study, as it requires room for maneuver for PBL to get people out of their comfortzones.

Moreover respondents acknowledge their inclination to fall back into their routines, especially under time pressure, which seems to have played an important role in downscaling the ambition of frame reflection:

*“When the moment is there, you fall back to what you are used to. Where the idea of perspectives has ended up in, is a bit into the product itself, and in the conversations with the ministry. There we should probably have attempted to get more people involved.. But well, also personal reasons played a role. .. what they are taken responsible for is a background document with an inventory of risks. And never mind how much you like framing; that is not what you are been taken responsible for. This matter played a role alongside.”* (respondent 4)

While revealing a certain amount of institutional reflexivity, this quote also strikingly illustrates how the scientific uncertainty frame has become routinized and institutionalized in the form of habits of thought and action, and thereby end up precluding reflection on particular frames.

## 5. Conclusion and discussion

In terms of deliberative democratic policymaking, adopting a multiplicity of frames can seem like a superior motive or ultimate outcome of framing. A pithy summary of this aspiration is that climate adaptation and mitigation is political, the political should be democratic, and the democratic should be participatory. However, inclusive forms of policymaking, as aimed for in

our case setting with an interdepartmental set-up of the NAS working group and outreach events to local actors, are not a guarantee for democratic policymaking that best meets the demands of a heterogeneous society. Creating coalitions that include a variety of stakeholders is no guarantee for the adoption of a multiplicity of frames, since members of coalitions may lack the ability or inclination to question a hegemonic frame. Our policy analysis case of the Dutch National Adaptation Strategy shows that, even when frame-reflection was explicitly aimed for, this happened to be downscaled, unwittingly, under influence of tensions, challenges and paradoxes encountered during the essential balancing act that characterizes complex science-policy interfaces in which roles, interaction processes, client needs, internal processes are dynamically shaping and shaped by institutionalised expectations over objectivity, independence, inclusiveness and effectiveness.

In addition, our discussion shows that the ulterior motive of a multiplicity of frames can inform policymaking, but is extremely difficult to realize in practice. This does not mean adopting a multiplicity of frames is impossible beforehand, but rather that the practicalities of doing so are out of step with current institutional configurations. Stressing the need to adopt a multiplicity of frames as a superior political ideal may only exacerbate the current improbability that a multiplicity of frames is adopted. The concrete practice of policymaking simply does not bode well for the ideal of adopting a multiplicity of frames.

Still, frame analysis has much to offer since it has the ability to cultivate and enhance reflexivity about frames used in developing policy measures related to climate adaptation and mitigation. Adopting frame analysis as a best practice at PBL can lead to a persistent balancing act between working 'descriptively' (doing 'proper' science à la 'speaking truth to power') and working 'prescriptively' (telling policymakers what to do).

Such a balancing act is important since working 'descriptively' can function quite 'prescriptively': underling that one is 'merely doing proper science' assumes an objective and authoritative perspective from which policymakers can be provided with knowledge needed to advance climate adaptation and mitigation. While such institutional norms remain largely uncontested, hidden from debate, they frequently explain the tensions, challenges and paradoxes that are to be found in science-policy interfaces.

Performing a balancing act between descriptive and prescriptive work is what makes up the 'craftsmanship' of doing research on the interface between science and policy. In that sense, PBL employees 'ride a razor's edge' between descriptive and prescriptive work.

In sum, we argue that what makes frame analysis worthwhile is not so much its presupposed power to lead to the adoption of a multiplicity of frames, but rather its ability to lead to a form of institutionalized critique that refuses to take automatic recourse to a dominant frame (e.g. the science-risk frame). Thus, frame analysis is a crucial instrument in performing the aforementioned craft of science-policy interfacing, and needs to be more firmly integrated into science-policy interfacing at PBL for this very reason.

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