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LIAISE offspring Edition



Linking
Impact
Assessment
Instruments to
Sustainability
Expertise

Innovation Report

Research Gaps in
Impact Assessment

Novel – Perspectives of
Young Researchers



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BIOGRAPHICAL INFORMATION OF THE AUTHORS

Dear Reader,

This edition of the LIAISE Innovation Report is a special one. It was written by early career researchers from the LIAISEoffspring network. Our idea was to offer these young researchers from different – natural and social science – disciplines a forum to present their ‘fresh’ perspectives on issues of impact assessment, tools and knowledge use in policy-making. The researchers, mostly PhD students, are concerned with various topics related to impact assessment. For the authors, the writing process of this report was a way of engaging academically with one another and to become aware of the different scientific backgrounds and theoretical and methodological approaches that guide the analysis. Thereby, the authors discussed their work in the light of existing “research gaps” as a joint topic. Which research gaps exist in the authors’ individual disciplines with view to their research projects? Could other disciplines contribute to closing these gaps? How could the disciplines be mutually supportive to overcome disciplinary gaps, or do they face similar ones?

The result of this endeavour is this Innovation Report. It contains three main parts: Chapter 1 discusses science-policy interfaces, Chapter 2 deals with stakeholder participation in different types of assessments, and Chapter 3 addresses research gaps in modelling and model use in impact assessment. The objective of all three chapters is to reveal gaps in the existing research and to discuss how these gaps could be, and in fact are, addressed by these young researchers. The three author groups chose their topics for this report independently, and the methodology used was also selected by each group. Therefore, the chapters are unique not only in terms of their content but also how they are structured.

Hence, this Innovation Report is very rich in topics, arguments and perspectives! No doubt, the authors already had stimulating thoughts and discussions while working on this report. We wish you, as readers of the report, the same: Have an interesting and fruitful read!

With best regards,
Sabine Weiland (FU Berlin) and Aranka Podhora (ZALF)

LIAISEoffspring

Johanna Ferretti, Pauline Rioussset, Daniela Chodrowska, Aranka Podhora

The LIAISEoffspring Network

LIAISEoffspring takes up the network idea from its 'mother project' LIAISE. LIAISE ("Linking Impact Assessment Instruments to Sustainability Expertise" Network of Excellence) is funded under EU-FP7 from 2009-2014. LIAISE is a Europe-wide network that focuses on integrated policy impact assessment. It aims at improving impact assessment tools and procedures with regard to sustainable development. The network addresses the science-policy interface by asking how scientific tools, procedures and processes can best be fed into the policy process to become more policy-relevant for all stages of the policy-making process.

LIAISEoffspring acts as a complement in that it convenes committed Early Stage Researchers (ESRs, including post-docs up to five years after their degree, PhD candidates, pre-docs as well as master students) from various disciplines working on the science policy interface (SPI) and policy-oriented impact assessment (IA). The network aims at enhancing interdisciplinary discussion and learning among ESRs with cross-cutting research interests.

The LIAISEoffspring network aims to

- be a long-term network, providing a platform for ESRs working on SPI and IA to get to know their peers;
- create and sustain a forum for discussion on questions, ideas and research related to SPI and IA;
- support fruitful interdisciplinary scientific exchanges and encourage joint research projects in the short, medium and long term (i.e. workshops, conference panels and sessions);
- enable its members to stay informed on SPI and IA related topics and news (events, jobs, funding opportunities) and share information among the network members; and
- enable its members to become more visible to the IA scientific community.

LIAISEoffspring was initiated by a group of ESRs from the Environmental Policy Research Centre (FFU) of the Freie Universität Berlin (FU Berlin) and the Leibniz Centre for Agricultural Landscape Research (ZALF). It is supported by all partners of the LIAISE consortium (in particular by Klaus Jacob from FFU and Aranka Podhora from ZALF as supervisors of this work).

The first LIAISE offspring workshop

Origin

During the first part of the LIAISE project, LIAISE offspring mainly extended invitations to ESRs related to the LIAISE consortium. Back to back with the LIAISE projects meetings, these young researchers developed the concept for building an external LIAISE offspring network and organised further meetings.

LIAISE offspring was officially launched during its first external workshop in October 2013, entitled “Impact Assessment: Methods for Evidence-Based Policy-Making and their Contexts of Use”. The two-day workshop brought together 20 ESRs from a large range of disciplines from policy and method oriented sciences, working in the field of SPIs at various levels (global to local) and in different countries.

Aims

The workshop theme arose from the challenge of scientific inquiry being specialised and fragmented. The production of scientific knowledge follows other rationales than its applicability in the decision-making process, however. Hence, producing policy relevant knowledge requires additional considerations. Researchers are often not trained to provide scientific policy advice. Thus, the organisers of the workshop assumed that training on interdisciplinarity and the SPI would help to facilitate a higher impact of science on policy. Thereby, the workshop also aimed at raising awareness about the contexts of use of scientific evidence in different sectoral administrations in different jurisdictions. The early career scientists working on methods, tools, and models to be used in the policy arena learned about the contexts of use of their research, and the requirements this brings with it for the production of usable research. Those participants working on SPI learned about quantitative and qualitative methods and tools and their constraints and potential.

Approach

In order to establish a basic common understanding of the two main issues of the workshop (contexts and methods/modelling for IA practice) among the participants, the workshop started off with two presentations from senior researchers – Sabine Weiland, from the Environmental Policy Research Centre (FFU) at Freie Universität Berlin, and Paul Hinssen, from WOT Nature and Environment at Wageningen University. Sabine Weiland discussed the contexts of use of evidence in policy-making and their main dimensions. She described different forms of assessments and defined policy impact assessments based on international experiences. In addition, she presented the range of methods available to support policy impact assessments.

Paul Hinssen presented one type of method in more detail: models for policy impact assessments. In particular, he discussed with the group the challenges of modelling in IA processes, such as the role of

uncertainties and how to treat them in policy making, the life cycle of models, and the 'expiry date' of a model.

The workshops participants then had the opportunity to present their research in smaller, yet interdisciplinary working groups. Day 1 concluded with a discussion, in which participants had to position themselves towards questions presented to them, such as whether a 'good' impact assessment requires the application of a method.

On day 2, participants gained insights from the view of an IA practitioner: Notis Lebessis, policy adviser and impact assessment contact in the European Directorate General for Agriculture and Rural Development. He gave a critical account of IA practice and research and the use of methods therein, from the perspective of decision-shapers at the EU Commission.

Provocatively, he argued that Impact Assessments, considered as expert's evaluation methods using modelling and simulation tools, have always been practiced in the Commission. Rather than focussing on tools, the institutionalisation of the process is an attempt to address known drawbacks of the decision shaping and making processes. This includes, among others, the tendency to frame problems according to pre-established solutions and the consequent path-dependency, lack of integration and segmentation of policies. IA can be seen as establishing rules to guarantee transparency and a better balance in integrating stakeholder's knowledge, professional expertise and concerns. This remains its main advantage, according to Lebessis.

Moreover, he noted that successful Impact Assessment processes, considered as aids for better policy shaping and as articulated collections of relevant evidence to inform decisions at EU level, were more often based on well-thought, organised and regulated processes of 'collective learning' among stakeholders and decision makers rather than on the latest state-of-the-art modelling capacities and quantification methods whose contribution is better suited when the policy environment is better known and stabilised (such as ex-post policy evaluation, for example).

To conclude the workshop, discussion started in three sub-groups, based on topics of interest to the participants. This report presents the outcomes of those discussions.

In addition to the publication of this Innovation Report as an outcome of the workshop, the LIAISEoffspring network envisages three types of further activities. Alongside an online exchange of ideas, articles, call for papers, and funding opportunities via our LinkedIn Group (see below), it plans common sessions at conferences and a regular annual meeting of the network.

Please visit the LIAISEoffspring section at the website of the LIAISE network (<http://www.liaise-kit.eu/content/liaiseoffspring>) to learn more about the activities of the LIAISEoffspring network.

How to participate in LIAISEoffspring

LIAISEoffspring is an open network and welcomes new participants. To become a part of it, join its LinkedIn group (LIAISEoffspring) or contact the LIAISEoffspring coordination team: Johanna Ferretti (johanna.ferretti@fu-berlin.de), Daniela Chodorowska (daniela.chodorowska@fu-berlin.de), Pauline Riousset (pauline.riousset@fu-berlin.de).

RESEARCH ARTICLE

Research Gaps in Impact Assessment: Novel Perspectives of Early Stage Researchers

Introduction

Which research problems and questions are tackled by early stage researchers (ESR) who are interested in science-policy interfaces? The research projects of the participants of the LIAISEoffspring workshop could be clustered into three main groups: research about different venues and types of science-policy interfaces (SPIs), the use of methods for (policy) impact assessment (modelling in particular), and challenges of participation in assessment processes at different levels. Each of these groups contributed a chapter to this Innovation Report, which you will find reflected in its structure.

Chapter 1 (“*Understanding Science-Policy Interfaces*”) discusses the contrast between rational, constructivist, and pragmatic perspectives, as well as the SPIs examined in different ESR research projects. Chapter 2 (“*Research Gaps on Stakeholder Participation in EIA, RIA and GEA*”) introduces different types of assessments institutionalised at three different decision-making levels: project, policy-making, and global level assessments. It analyses the role of stakeholder engagement in each of them. The selected case studies illustrate the challenges of stakeholder involvement in IAs. Chapter 3 (“*Research Gaps in IA modelling*”) focuses on the various contexts in which models are applied, the interplay between science and policy-making cultures, and models’ technical constraints. As an example, the ASTRA model is discussed in more detail. In all three chapters the gaps or missing elements in the existing research literature are described, followed by a discussion on how the ESR research projects and questions start to address those gaps. The fourth and final chapter summarises the findings of these three chapters and provides an outlook on the implications for further research and the LIAISEoffspring network itself.

At the end of the Innovation Report, biographical notes are provided for all ESRs who contributed to this report to give an impression of the wide range of research issues addressed by the network.

Chapter 1: Understanding Science-Policy Interfaces

Anna-Lena Guske, Garrett Richards, Johanna Ferretti, Eva Kunseler, Wanda Van Enst, and Lisa Pettibone. With contributions from Anna Gayer, Dominika Mucha, and Pita Spruijt

Introduction

This article gives a brief overview of the theoretical approaches towards SPIs. Against this theoretical background, the research projects of nine early-career researchers exploring SPIs in their various forms are then presented. These projects all take an empirical stance. The article shows how these projects tackle research gaps in three overarching areas crucial to the understanding of SPIs: a) knowledge co-production, b) communication of research results to decision-makers, and c) policy impact assessment processes as institutionalised instruments for enhancing SPIs. The empirical material from the ESR projects illustrates that SPIs can benefit from greater interaction between scientists, policy-makers and societal stakeholders, but that the functioning of these three groups is highly dependent on contextual circumstances.

Theoretical Approaches to the SPI

Policy-making at all levels and in all sectors of government requires information in the form of statistical data, empirical evidence and scientific analysis. Science-Policy Interfaces (SPIs) are the “social processes which encompass relations between scientists and other actors in the policy process” (Van den Hove 2007: 807). As such, they are a broadly discussed subject among policy-makers, scientists and scholars of policy-making. While the concept of an SPI is general and descriptive, a range of specific normative approaches for the design of interactions between science and policy have been proposed over the years. Generally speaking, we can distinguish three theoretical approaches: the rational, the constructivist, and the pragmatic approach.

The central premise of the *rational* perspective, which arose from a positivist scientific tradition and gained dominance in managerial public policy discourse in the mid-20th century, is that policy-makers should systematically gather information and consider all alternatives before making the (objectively) “correct” or “best” decision (Fischer 1998; Howlett et al. 2009). Hence, science and policy are thought to interact via a linear model: science supplies knowledge required by policy-makers. However, empirical evidence shows that scientific findings are often disregarded in policy-making processes, even when scientists adhere to criteria of scientific excellence and present state-of-the art results (Jasanoff 1994).

As a reaction to this view, the *constructivist* perspective arose, claiming that knowledge is constructed through social assumptions and norms, rather than existing as an objective truth. As such, its proponents are more interested in creating interactive forms of decision-making that

incorporate multiple views (Fischer 1998; Healey 2008), as opposed to privileging science as an input. However, studies show that broad stakeholder participation alone cannot legitimate decisions if they contradict the findings of the scientific community (Jasanoff 1994) – essentially, neither scientific findings nor political consultation are particularly effective inputs to the policy process if used independently of one another and they are often conflicted.

The *pragmatic* perspective addresses this complexity by deferring to the acquired experience of experts who navigate SPIs on a regular or formal basis. It acknowledges the skills, knowledge and judgement of experts (Flyvbjerg 2006). In this view, experts may consider stakeholder participation necessary for credible scientific knowledge production – for instance, to accommodate uncertainties related to a diversity of knowledge perspectives on the topic or a diversity of values among the involved groups. In ensuring the relevance of information, they may also pay attention to the timing, scope, and perceived legitimacy of research (Cash et al. 2002). Essentially, the pragmatic perspective assigns a role to the expert judgement of what kind of knowledge is needed: knowledge that is credible, relevant, and legitimate to all actors involved in decision-making processes (Weiland 2011). Each of the three perspectives has something to offer.

Research Gaps – Knowledge Co-production, Science Communication, and Policy Impact Assessments

Considering the three perspectives together, it is widely acknowledged that both the consideration of scientific findings as well as the integration of stakeholders' knowledge in the knowledge production process are crucial for increasing the credibility, legitimacy and relevance of knowledge for policy making; however, the mechanisms for integrating science, policy, and society (i.e. how exactly to manage SPIs) are still not entirely clear. Despite the attempts of constructivists and pragmatists to interpret SPIs as dynamic and interactive settings, problematic linear patterns in SPIs can still be observed, for example:

- Knowledge is deliberately ignored by policy-makers (Innes 1990);
- Scientists overestimate the value of their work and misunderstand how it is used in policy-making (Lindblom & Cohen 1979);
- Scientists present their findings selectively (Barber 1987);
- Knowledge remains incomplete due to exclusion of relevant stakeholders or types of knowledge (Fischer 1998; Healey & Hillier 1996);
- Scientists and policy-makers use different assumptions, values, and language to discuss policy problems (Lindblom 1990);
- There is no widely accepted set of criteria to measure the credibility, relevance, and legitimacy of knowledge and compare them against one another so far (Jahn et al. 2012);

In investigating how to best view, analyse, and facilitate SPIs so that these barriers might be mitigated, several issues seem to be crucial,

which we address in our research projects.

First, knowledge co-production emerges as a concept for more useful science and more effective policy. That is, scientific knowledge can be seen as being produced by an integral process involving both scientists as well as other social actors, who come to a mutual understanding where possible, and also communicate their respective needs and limitations to one another (Jasanoff 2004). Research questions that still need to be addressed in this context are:

- What are the general preconditions to enable knowledge co-production?
- What are the criteria for measuring the quality of research that was co-produced?
- Which methods are best suited to facilitate knowledge creation processes that involve scientists as well as policy-makers and other societal actors?

Secondly, communication of scientific findings to other actors remains a crucial aspect of SPIs, not only because the ideal of co-production is not always possible, but because information still needs to be interpreted and synthesised for general use even if policy-makers and other societal actors are engaged in the production process to begin with. Questions that still need to be answered are:

- How can scientific findings be presented so that they are regarded as legitimate, credible, and relevant for policy-making?
- How can knowledge be contextualised in terms of relevant policy issues to be tractable and easily accessible for policy makers?
- Which actors should be involved in the communication process? How should they be involved?

Thirdly, institutionalised processes such as policy impact assessment (IA) can serve as formal SPIs. IA was introduced as a tool to collect evidence on the likely future impacts of proposed policies with the aim to minimise unwanted side-effects and to maximise the benefits for society. Although IA systems are in place in all OECD countries and the EU, the IA systems vary considerably in terms of actors involved, the methods and models used, as well as their implementation and use in the policy-making process (Jacob et al. 2012). Research gaps still exist regarding the following questions:

- How do political, cultural, and institutional contexts influence the set-up of the IA process?
- Which actors need to be involved in the process to ensure the relevance and legitimacy of the IA?
- How might tools be designed to support the IA process?
- Under what circumstances does IA lead to a better integration of sustainable development goals into policy-making?

Against this background, our research projects, which are introduced in the following section, attempt to put forward a fresh perspective on SPIs and address some of the above gaps, though they do so in very different

ways. Each of us moves beyond a primarily theoretical discussion to concentrate on how SPIs function in reality using in-depth, empirical studies. We investigate a wide range of SPIs that deal with diverse policy problems over a wide range of jurisdictions, acknowledging the importance of context in managing and understanding the SPIs of any given case effectively. In this way, we contribute to the development of a broad overview of conditions that must be met to establish well-functioning SPIs. Our conclusion illustrates how networks like LIAISEoffspring can improve the understanding we have of our own projects by giving us the opportunity to compare them against others which are rooted in various disciplinary and jurisdictional backgrounds.

Perspectives on Science-Policy Interfaces

As elaborated above, our collective research explores the function of SPIs, addressing three key issues: a) knowledge co-production: how knowledge (i.e. in its wider meaning, not simply the interpretation of evidence produced by the scientific community) can be generated so that it is meaningful in policy-making processes, b) communicating scientific findings: how communication about existing research results between science and policy can be improved in various institutionalised settings of SPIs, and c) policy impact assessment as an institutionalised SPI: how a specific SPI instrument, IA, can be used to improve the evidence base of policy-making and facilitate the interaction addressed under the two above issues.

Knowledge Co-production

Although we are writing about SPIs, all of our research projects acknowledge that science is not the only source of knowledge, though it is important. Consider the notion of knowledge co-production (Jasanoff 2004), the generation of data and information by including policy makers and other stakeholders in the knowledge production process, which is sometimes interchangeable with the term science-policy interface (Cash et al. 2003), showing an important overlap amongst the concepts. In this context, we address the question of which criteria and conditions must be met to successfully produce results that are relevant for knowledge users. Hence, several of our research projects look at the knowledge production process, as well as its background conditions, from very different angles in order to contribute to the discourse on criteria for transdisciplinary, policy-relevant research.

Plans, indicators, and institutions: An examination of urban sustainability governance in six U.S. and German cities

Lisa Pettibone's research seeks to understand empirically and specifically how sustainability indicators generated to help guide policy-making toward a sustainability transition are used by political, administrative, and civil society actors in U.S. and German cities. Her comparative case study approach focuses on how and by whom sustainability indicator sets were created and used in six cities. Her

findings support the constructivist perspective on SPIs: sustainability indicators were often created by civil society actors in order to advocate for a normative shift in policy, for example toward more consideration for environmental protection or social equity. Indeed, not a single scientist-developed indicator set saw measurable use by policy-makers. Most such sets were thus quickly abandoned, highlighting the empirical inaccuracy of the rational approach to SPIs. Instead, she found support for a more deliberative model: indicators have most often been used to share narratives of sustainability and advocate for specific policies as well as to shift values to better align with sustainability principles. Indicators' discursive role in policy-making, however, remains poorly understood and is worthy of further study.

Institutional bridges between climate science and policy in Canada

Garrett Richards also takes a closer look at processes of knowledge production, but specifically regarding the issue of climate change in Canada, where SPIs are in need of further analysis. That is, not only has the country made little progress on reducing its greenhouse gas emissions since the Kyoto agreement of 1997, but its per-capita emissions are among the highest in the developed world. In his PhD project, he examines formal dialogues (e.g. in-person meetings) between scientists and policy-makers at provincial and municipal levels in Canada to gain insights on how to improve the effectiveness of SPIs at the national level. Through an investigation of these subnational interactions, Richards hopes to show that creating similar institutional arrangements at the federal level will lead to more effective action on climate change and better meet the needs of scientists, policy-makers, and other social actors.

Preliminary research has already shown that, while the ideal of co-production is promoted by many scholars of SPIs, formal engagement between scientists and policy-makers (that genuinely attempt to 'co-produce' both knowledge and policy) is actually very rare. The concept of co-production, as it stands right now, might be more practically conceived of as a way to explain the organic, ad-hoc, chaotic nature of SPIs in reality than as a specific prescriptive ideal. More empirical research is needed to test and confirm the suggestions of the theory. The instances of formal co-production that do exist (e.g. those at provincial and municipal levels in Canada), as rare as they are, appear to be incredibly effective at meeting the needs of various groups involved in climate SPIs. We can use them as 'exemplars' to provide specific institutional recommendations for other policy sectors, since such specifics have generally been lacking in the theoretical literature. Such findings appear to support the constructivist and pragmatic perspectives (i.e. it is not so much the resulting knowledge that is important, but the interaction between scientists and policy-makers itself), in part, but also acknowledge the importance of scientific inputs, as embodied by the rational perspective.

Knowledge co-production in a formal SPI setting

Eva Kunseler studies the production of knowledge by researchers in interaction with policy-makers and other stakeholders in formal SPI settings. She examines how researchers at the Netherlands Environmental Assessment Agency (Planbureau voor de Leefomgeving – PBL) increasingly come to terms with knowledge co-production. The questions she addresses are: How do interactive processes influence the activities and conditions of assessment processes? How do researchers ensure the quality of assessment processes and their knowledge output? Comparative in-depth case studies of policy assessment projects at the PBL demonstrate how PBL researchers pragmatically organise interaction with policy-makers and other stakeholders and accommodate the challenges they encounter along the way: they use skill and judgement rather than theoretical reasoning. Interaction with stakeholders strengthens, but also complicates, their attempts to produce knowledge that is perceived of as relevant, credible, and legitimate. As such, Kunseler finds that the idea of knowledge co-production is still fairly idealistic. Whereas training of expertise and skills invokes improved understanding of the co-production rationale, researchers working in formal SPIs feel a need to ensure their independence and autonomy, which prevents them from really engaging in shared knowledge collaboration.

Together, Pettibone, Richards, and Kunseler find support for, but also limitations of, the ideal of co-producing scientific knowledge and policy outcomes. Formal interaction between scientists and policy-makers seems to be rare, and the informal engagement that does occur is complicated, because it must reconcile the tensions between needs of the involved groups. Certainly, co-production is not an easy solution to the science-policy gap (i.e. the barriers to translating scientific findings directly and immediately into policy outcomes). However, the goal of co-production still appears to be a positive force, as it provides scientists and policy-makers with experience in dealing with one another, can help them understand the broader context of their own goals and needs, and may lead to long-term shifts in underlying values.

Science Communication

In addition to involving societal actors and policy makers in the knowledge production process, the communication of scientific findings is a crucial step for integrating science into policy-making. Effective methods of communication can help ensure that scientific knowledge is meaningfully considered in the policy-making process, so that its potential does not go to waste. However, the best way to do this is not always clear, and researchers are faced with various challenges in this regard.

Social knowledge about urban air pollution in Warsaw

The research of Anna Gayer and Dominika Mucha involves conducting

health impact assessments regarding urban air pollution. An important part of this issue is social (or public) knowledge. Social knowledge is a necessary part of raising awareness about the state of air quality in areas frequented by citizens and can help improve the (scientific) knowledge about the influence of air pollution on human health. As an extension of this, their research project is also interested in how society reacts to more information about consequences of air pollution – for example, whether they take action to improve their personal situation. Perhaps most importantly, because policy-makers often cite expected social resistance as a reason not to move forward with pollution-mitigating action (e.g. entry fees or restricted access for vehicles travelling to central areas of the city, regulations for vehicles that do not meet environmental standards, or restricting the use of certain fuels for heating households), improving social knowledge can often make such policies more acceptable to the public, showing that they are based on more objective research. Essentially, the study aims to discover how to enhance social knowledge about air pollution and thereby encourage policy-makers to take measures to reduce emissions in urban environments.

In this vein, the scientific team of Gayer and Mucha concentrates on determining the exposure of individuals to traffic air pollutants and its risk factors for human health. They seek to communicate those findings to a wide audience of policy-makers, the public, and other scientists in a flexible and adaptive process involving a broad range of stakeholders. For example, impact assessments help determine the economic, social, and environmental consequences of transport policies, environmental management, and urban development decisions (e.g. it may not always be ethical to suggest an increase in cycling activity because the cyclists will be more exposed to air pollution, even though they are helping to address the problem). They have already faced some difficulties in communicating with policy-makers, despite the generation of policy-relevant findings, but it is nevertheless hoped that this socially-relevant research will lead to stronger arguments in favour of air quality protection and change the perception of the public. Gayer and Mucha demonstrate the importance of close cooperation and communication between scientists, policy-makers, and the public (i.e. there is overlap with the co-production theme here).

Goals and strategies of SPIs in the Wadden Sea area

Wanda van Enst and her colleagues argue that the current scientific debate provides them with little clarity on questions such as: Which SPIs are most useful to solve which science-policy interaction problems? What strategies should be employed? How do contextual factors influence the performance of the SPIs? Or, in short, when it comes to SPIs, what works when, where and how?

Broadly, van Enst claims that the scientific literature on environmental policy discusses a wide array of science-policy interaction problems,

which could be characterised into three main issues: the strategic use of knowledge by policy-makers (e.g. Michaels 2009; Owens et al. 2006; Sarewitz 2004; Van Buuren & Edelenbos 2004), the strategic production of knowledge by scientists (e.g. Lackley 2007; Pielke 2007; Bäckstrand 2003), and the operational misfit between demand for and supply of knowledge (e.g. Pohl 2008; Wardekker et al. 2008; McNie 2007; Sarewitz & Pielke 2007). This same body of literature suggests the use of SPIs to enhance interactions by promoting the production and use of more credible, legitimate and salient knowledge, which ought to lead to 'enriched decision-making' (Van den Hove 2007).

Specifically, van Enst focuses on SPIs by researching the process of participatory knowledge production and the role of boundary organisations and science-policy mediators, which may facilitate the science-policy dialogue and contribute to improving the interactions between science and policy makers. Her empirical research is focused on the Wadden Sea area, a UNESCO heritage area where environmental science-policy interactions and SPIs are known to be controversial (Runhaar 2009). She examined three boundary organisations: the Wadden Academy, a research institute; IMSA Amsterdam, a consultancy firm; and the Netherlands Commission for Environmental Assessment, a government institute. All are situated in, or have close ties with the Dutch Wadden Sea area. Currently, representatives of the organisations as well as stakeholders who encounter these organisations in practice are being interviewed, and an analysis of these organisations as 'boundary organisations' is being put together, supplemented by desk research. Conclusions, however, are still preliminary.

Van Enst's following research will focus on individual science-policy mediators: interviews will be conducted with 15-20 individuals, who are thought to fulfill a mediating role between science and policy. The emphasis of this research will lie on the (formal and informal) strategies these individuals employ, and how this can influence the increased use of credible, legitimate and/or salient knowledge in 'enriched decision-making' (Van den Hove 2007). While still in its initial stages, van Enst's research, overall, illustrates the importance of boundary organisations and science-policy mediators for addressing interaction problems.

The various roles of scientists who give policy advice

Pita Spruijt takes a closer look at individual researchers acting as policy advisors. The aim of her research is to gain more insight into the different roles they might fulfill, in order to enable more effective and accepted policy measures through greater uptake of scientific information in the policy process. For example, whereas some researchers may feel their primary task is to carry out fundamental research, others may actively engage in the policy dialogue. To better understand the roles of scientists who provide policy advice, empirical research was conducted on the complex issues of electromagnetic

fields, particulate matter, and antimicrobial resistance. These cases were chosen because they are all complex environmental health issues surrounded by scientific uncertainty, which makes it possible for scientists to interpret the uncertainty differently when they generate policy advice.

The preliminary results indicate that experts indeed differ in their interpretation of uncertainty surrounding these three complex issues and consequently give different policy advice. These differences can affect the decisions of policy-makers. The topic of electromagnetic fields is illustrative: uncertainty about the potential health effect of electromagnetic fields has led to a situation where some countries have adopted a precautionary approach and others, based on the same scientific knowledge, have emphasised the absence of proof of adverse health effects and therefore have not implemented any policy interventions (Kheifets et al. 2001; Van Dijk et al. 2011). Furthermore, based on a literature review, Spruijt notes that research on expert roles has remained largely theoretical (Funtowicz & Ravetz 1990; Weiss 2003; Pielke 2007). Nevertheless, publications on scientific experts who provide policy advice affirm that they should and do hold different roles (Hoppe 2009; Spruijt et al. 2013; Turnhout et al. 2013). These different roles depend on, for example, the type of problem, the values and the type of knowledge of an expert, the national and institutional context, and other factors. More insight in the different roles of experts can lead to improved interactions in SPIs.

Policy Impact Assessments as an Instrument to Improve Science-Policy Interfaces

The research projects presented above examined the options for interaction between researchers and policy-makers, looking at actors such as boundary organisations or the individual researcher. However, policy impact assessment (IA) is an institutionalised process that aims at integrating scientific findings into policy making and hence improving the base of evidence for policy-making. These processes are now established in all OECD countries as well as the European Union at large. However, it is still unclear under which circumstances environmental issues are considered, how these IA processes contribute to considerations of sustainability in policy-making, and what tools can support the process.

Do IA processes promote environmental policy integration?

In her research, Johanna Ferretti focuses on policy impact assessment processes as one type of SPI. In principle, IAs are evidence-based (i.e. evidence produced by stakeholders or the science community) formalised procedures that assess beforehand the intended and unintended impacts of policy proposals on economic, social and/or environmental concerns, in order to inform decision-making. Steps of an IA include the analysis of impacts, interdepartmental coordination, and stakeholder consultation. Specifically, Ferretti's research investigates

how far IA processes promote environmental policy integration (EPI). While IAs have been considered as instruments for EPI (Jordan & Lenschow 2008), the environmental dimension in IAs is usually weak and varies, particularly in contrast to economic concerns (e.g. Jacob et al. 2012).

The question of how far IAs actually promote EPI is tackled by examining IA processes in Great Britain and Germany on the implementation of two EU Directives. Ferretti compares the IA processes of the English 2007 Renewable Transport Fuel Obligation and the 2006 German Biofuels Quota Act, both implementations of the EU Biofuels Directive. As well, she analyses the EU Waste Framework Directive, implemented in England as the 2011 Waste Regulations and in Germany the 2012 Circular Economy Act. The comparison uses actor-centred institutionalism theory. It focuses on the interactions between involved actors and how the institutional structures enable or constrain the behaviour of such actors. By comparing the IA processes on the implementation of the same EU Directives, though in different member states and in different policy domains, Ferretti is able to examine the role of two dimensions of context: What role do institutions and actors play in the course of IA processes and their effectiveness in terms of EPI? This will contribute to a better understanding of IA processes, their driving factors, and what determines higher or lower levels of environmental integration in IAs and policies; and it will allow lessons to be derived for improved EPI in future IA processes.

Preliminary findings show that the environmental evidence produced by actors in IA processes in implementing the same basic directive can diverge dramatically in different states; moreover, the role the evidence plays, and the way it is used and presented (e.g. in form of IA reports) contrasts sharply in both EU countries. Further analysis of the IA processes has to tackle the question of how far this depends on institutional conditions or the relevant actors, and what other factors influenced the level of EPI in the policies.

Sustainability Check Luxembourg

In many countries Sustainability Impact Assessments (SIAs) have been introduced to assess whether proposed policies would contribute to sustainable development. They aim at harvesting scientific knowledge as well as stakeholder interests into the policy making-process. In the research of Anna-Lena Guske, SPIs are conceptualised as the interaction between science and policy-makers in these impact assessment processes.

Her project was conducted at the Environmental Policy Research Centre (FFU) at the FU Berlin and commissioned by the Luxembourg Ministry of Sustainability. It aimed at constructing a SIA process tailored to the specific institutional and political contexts in Luxembourg. To design a procedure that reflects the background conditions, fits into

the existing policy-making process and facilitates the development of guidelines for conducting the assessment, a spreadsheet tool was created, which could support the SIA by presenting scientific findings on the impacts of a policy proposal on the different dimensions of sustainable development. Moreover, it allowed for the comparison of options while making transparent which assumptions underlay the assessment. Hence, this tool helped to foster discussion on the impacts of a proposed policy on sustainable development and the role science played in analysing and rating the policy options.

Furthermore, the project showed that these sustainability impact assessments often follow similar procedural approaches that ensure that scientific knowledge and stakeholders are both included in the assessment process. However, it is often difficult to simply transfer these concepts to other jurisdictions. The specific national contexts in which the impact assessments are carried out have to be taken into account when setting up a sustainability impact assessment (SIA) process – for example, the existing regulations for drafting policy bills, the actors involved in the policy making process, and also the political culture. Hence, the specific framework conditions, which may include institutional, political, and cultural aspects, have to be analysed carefully to ensure the IA process is designed so that it is perceived to be legitimate. However, general frameworks or concepts regarding how these contexts could be systematically included in the design of SIA processes are still missing and could be subject to further research.

Conclusion

Overall, our research projects demonstrate the importance of SPIs as a research focus relevant to a broad range of policy problems and particularly important for contemporary environmental challenges such as climate change and urban sustainability. They also illustrate the diversity of nuanced venues that can be used to study SPIs, such as formal institutionalised settings, deliberative processes, as well as specific procedural instruments such as policy IAs. The current literature that addresses these issues is not especially cohesive. We can address some of this evident complexity by examining the collective findings of our research projects. Doing so, we make two general observations.

First, the context that surrounds any given SPI – i.e. the policy issue being addressed, the institutional and cultural constraints of the surrounding jurisdiction, and the type and level of knowledge held by relevant experts – is important in determining how to understand and manage that SPI. Ferretti shows that the evidence produced and used by actors in IA processes in implementing the same basic directive can diverge dramatically in different states. Guske finds that, although tools can be developed to facilitate discussion and assess impacts in one jurisdiction, they may not be easily transferable to others. More generally, Spruijt notes that context matters for the role played by scientific experts in an SPI and van Enst puts forward a useful

framework to determine what SPIs work when, where, and how (i.e. boundary organisations and science-policy mediators are important for accommodating the diverse complexity of various SPIs).

Second, SPIs generally appear to benefit from stimulating interaction between the involved actors. In one case, Gayer and Mucha found that scientists run into barriers when trying to communicate directly with policy-makers, who may not be equally willing to engage. Kunseler suggests that researchers who embrace a more pragmatic approach can lead to the emergence of more effective interaction with policy-makers and other stakeholders. Pettibone's findings support this: sustainability indicators serve most frequently as a tool to change the terms of debate rather than to support concrete decision-making. Richards observes that true dialogue between scientists and policy-makers can be purposefully facilitated and does not have to emerge organically, although this occurrence is quite rare. It is often best to look at the level of genuine interaction taking place in an SPI, rather than attempt to assign blame to scientists or policy-makers when SPIs appear to be lacking.

While we hope the lessons emerging from our research will be useful to other researchers and SPI actors, but there is also something to be learned independently from the process of meeting with one another and discussing our work together. Communicating with other SPI researchers has helped us understand the complexity of the field, just as the engagement of SPI actors helps them manage the complexity of a given policy issue. Similarly, we all come from different academic backgrounds and take different approaches to studying SPIs. We should continue to engage academically with one another, and we should respect the unique context of each researcher in doing so.

In the end, many open research questions remain: there still exists great potential for additional fruitful research in the field of SPIs. However, we have shown the importance of conducting empirical investigations in addition to theoretical analysis, and hope we have generated some useful guidelines about co-production, communication, impact assessment, context, and engagement for other SPI researchers and actors to keep in mind. Although we did not resolve the ongoing debate related to the role of science in policy-making (i.e. how the three perspectives might be productively reconciled), we hope that we have provided some direction to make that debate more productive or less of a barrier to effective policy research.

Chapter 2: Research Gaps on Stakeholder Participation in EIA, RIA and GEA

Jennifer Garard, Daniela Chodorowska, Claire Range and Nina Hagemann

Introduction

Since the first emergence of Environmental Impact Assessment (EIA) with the introduction of the National Environmental Policy Act (NEPA) in the USA in 1970, a whole family of assessment categories has emerged (Bond/Pope 2012). This article focuses on three of these types: EIA, which address project level assessments, Regulatory Impact Assessment (RIA), which address regulation on the national policy level, and Global Environmental Assessments (GEAs) which address issues related to global environmental changes. These assessments follow different rationales and may thus require different approaches of stakeholder participation, which makes them an interesting subject for comparative research.

One aspect that illustrates these differences is the stakeholder group involved in each type of assessment. There is however no consensus in the literature on the definition of the terms “stakeholders” and the “public”. Some authors use them interchangeably (Glucker et al. 2013, p. 109), others insist that they differ (Dietz and Stern 2008, p. 15; Reed 2008). Dietz and Stern (ibid.) only consider organised interest groups representing affected interests to be stakeholders. Others define every affected or interested person as a stakeholder (Petts 1999, p. 150). In this article, we distinguish between the public and stakeholders.

In EIAs, which deal with mostly local public or private investment projects, stakeholders are comparatively easy to determine: they are the people affected or interested in the project. In RIA, the identification is more difficult, since the potentially affected group is considerably bigger at national level. In GEAs, which in theory concern the entire world population, criteria beyond being interested or affected must be employed.

The context for an increasingly scientific approach to stakeholder participation with regard to the three different types of assessments can be found in the 1990s theoretical turn in EIA research which contributed to surmounting common technical, non-contextual thinking about impact assessment (Morgan 2012, p. 7). The application of Habermasian deliberative democracy ideals for the elaboration of good EIA practices resulted in a rise in ambitious expectations about the democratic quality of broad and substantial stakeholder participation in environmental decision-making (ibid.). A few years later, the new normative rationale for EIA stakeholder involvement found its counterpart in the political realm in terms of the 2003 Amendment of the European EIA Directive that integrated the Aarhus Convention principles for stakeholder participation (Hartley and Wood 2005).

Today, thinking about the rationale for EIA stakeholder participation has evolved towards a pragmatic approach of dealing with the science-policy dichotomy as a result of ever more practical experience and its increasing critical evaluation (Beierle 2002, Reed 2008, Morgan 2012).

While a relatively wide range of theoretical and empirical studies has been published on EIA stakeholder participation (Petts 1999; Bond et al. 2004; Palerm 2000; Portman 2009 O’Faircheallagh 2010; Elling 2011; Saddler et al. 2011), there still remain important research gaps to be addressed as described in the next section. Moreover, the other two assessment types are far less represented in academic publishing, although the relevance of participatory elements for RIA and for GEAs is indisputable (Adelle and Weiland 2012; Mitchell et al. 2006). For RIA expert knowledge is required to make well-informed decisions and increase the legitimacy of policies. In GEAs, stakeholder participation has been found to improve the legitimacy, credibility and policy relevance of the assessment (Andonova 2006; Selin 2006).

This chapter presents three selected case studies on stakeholder participation. The first study is an outcome of the PhD research by Daniela Chodorowska who focuses on Post-accession Compliance among the new European Member States. She examines the role of socialisation processes comparing the implementation of the European EIA Directive in compliance leader Lithuania and compliance laggard Poland. The second case study came out of the LIAISE project and focuses on Ukraine. It contributes to the already existing knowledge within LIAISE by presenting results from outside the EU. The work is done and presented by Nina Hagemann. The third case study focuses on Global Environmental Assessments (GEAs) that are currently being analysed in the context of a collaborative research initiative conducted jointly by the Mercator Research Institute on Global Commons and Climate Change (MCC) and the United Nations Environment Programme (UNEP). Jennifer Garard is addressing the research gaps regarding stakeholder participation as part of her PhD studies at MCC.

This paper is structured as follows. The next section introduces the three assessment types and elaborates on the role of stakeholder involvement with a focus on the identification of research gaps in the existing body of scientific literature. Then, this chapter explores selected case studies and attempts to make a contribution to closing these gaps. In the conclusion, we point to some questions for future research.

¹ Council Directive 85/337/EEC181 on the assessment of the effects of certain public and private projects on the environment as amended by Directives 97/11/EC182, 2003/35/EC183 and 2009/31/EC184 and codified by Directive 2011/92/EU.

Participatory approaches in EIA, RIA and GEA

Environmental Impact Assessment (EIA) is a means to assess the impacts for projects which are likely to have a significant effect on the environment, i.e. private or public projects such as urban development, waste disposal installations, highway construction or new power plants. In the European Union, EIA is regulated by the European EIA Directive¹

for its member states. This Directive introduced an integrated and procedure-oriented approach towards environmental assessments (European Commission 2009, p. 7). It departs from the assumption that environmental damage by projects can be prevented if all relevant and available detailed information is assembled and processed in a transparent manner. In a similar vein, it is assumed that a good procedure, i.e. the adherence to systematic evaluation principles and cross-sectoral assessment procedures that are regulated by law, will result in good environmental decisions (Börzel 2003, p. 100). With regard to EU environmental law in general, the EIA Directive can be distinguished as one of the first to have incorporated a precautionary problem-solving approach that aims at engaging stakeholders, “defined as those who are affected by or can affect a decision” (Reed 2008, p. 2418), at the earliest possible stages of environmental decision making (ibid.). The element of stakeholder participation became strengthened by the 2003 Amendment tying up the EIA Directive to the 1998 Aarhus Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters.

Art. 6 of the EIA Directive requires public authorities to give stakeholders “early and effective opportunities to (...) express comments and opinions (...) before the decision on the request for development consent is taken. (...). Reasonable time-frames for the different phases shall be provided (...)” (Council Directive 85/337/EEC181).

The emphasis on early stakeholder involvement aims at reducing conflicts that tend to occur if citizens are taken by surprise regarding, for example, local construction projects. It can help legitimise decisions of public administrators and strengthen public servants’ credibility. In general, stakeholder involvement means more information about the problem and possible solutions as stakeholders can help generate additional data and find alternative options. EIA stakeholder involvement can also increase environmental awareness and enhance civil engagement (Reed 2008).

In terms of practice, the implementation of the abovementioned requirements varies nationally. On the one hand, the European Commission as well as the UN Economic Commission for Europe (UNECE) that oversees the implementation of the Espoo Convention² on transboundary EIA have provided guidelines for authorities on how to arrange public participation procedures for national stakeholders as well as those of possibly affected countries, so that they have a realistic option for influencing the assessment processes. These best practice hints include early planning, adequate funding, straightforward and user-friendly informational policy, transparent and well-argued responses, detailed documentation, well-defined timelines, options for appeals, and equal treatment of all participants. On the other hand, however, the Directive itself provides only general instructions for stakeholder engagement, admitting significant administrative discretion. In general, EU member states that do not comply with the

² In 1997, the European Community joined the “Convention on Environmental Impact Assessment in Transboundary Context” which involves complex procedures of transnational stakeholder involvement.

EIA Directive are brought to justice in the form of EU infringement proceedings. As a result, compliance variance across the EU manifests itself in (potentially biased) data provided by the European Commission on the frequency and intensity of non-transposition or non-application of EU Treaty provisions.

One of the most comprehensive evaluations of national EIA implementation processes has also been edited by the European Commission (European Commission 2009). The authors of the study found, for example, that only few member states enable stakeholders to participate at the first stage of the process for development, consent issuance, i.e. during the so-called screening procedure, which clarifies whether an EIA is necessary (ibid., p. 10). Also the possibility to challenge EIA outcomes varies nationally in terms of review access arrangements³.

However, in sum, research on the differential compliance outcomes among EU member states regarding EIA stakeholder involvement remains in its beginnings. More specifically, especially literature on EIA stakeholder participation within Central Eastern Europe is scarce and limited to descriptive analysis, centring on legislative provisions and their applicability problems, but relating only non-systematically to the above-mentioned theoretical turn in Western EIA research (Cherp 2001). Moreover, literature on national EIA implementation tends to be written in the respective language, impeding pan-European scientific progress.

Drawing on preliminary empirical findings of a case study on EIA compliance laggard Poland, the first case study of this chapter constitutes an attempt to fill in the above gap by highlighting some of the main challenges for EIA stakeholder participation in the new EU member states and by hinting at possible factors and mechanisms that might have an impact on the outcomes of involving stakeholders in assessments across Central Eastern Europe.

Regulatory Impact Assessment (RIA) is a form of assessment (Adelle and Weiland 2012) that aims at ensuring better regulation. Since 1995 RIA is a tool taken up and prescribed by the OECD for its member states to enhance the quality of regulations and reduce their costs (OECD 1997). Jara and Schwarz (2012, p. 2) define RIA “as a systematic instrument and process of ex ante evaluation of regulation before it is proposed to legislators and ex post verification if the regulation has fulfilled its goals by comparing the actual impacts of regulation with its predicted counterparts”.

As such the approach aims to provide information beforehand and to “enhance the empirical basis of political decisions” (Radaelli 2004). In contrast to EIA with its focus on environmental impacts, the scope of RIA procedures has been widened in recent years covering the whole range of impacts including economic, environmental and social

³ For a recent example of EIA implementation failures by EU member states, cf. http://europa.eu/rapid/press-release_MEMO-13-907_en.htm

impacts of a policy and as such referring to sustainable development. Despite the well-acknowledged definitions of the RIA concept, the implementation of RIA differs between countries (Radaelli 2010). Concerning the methods that are applied, Radaelli (2004) observes that “RIA includes a range of methods (...) that can be used flexibly to measure ex ante the impact of proposed regulatory policies on social welfare or on selected target populations such as small businesses, companies, non-profit organisations and public administration”. Here, the approach will be transferred to the topic of environmental policy and more specific water management in Ukraine, and research gaps on this case will be identified.

As it is a device to facilitate better regulation, transparency and participation are important facets of RIA (Radaelli 2010). This is even more important since RIA includes the assessment of impacts of a regulation on all affected stakeholder groups that might otherwise not be heard. According to the OECD rule-making should be more open and participatory including the possibility for interest groups to participate early in the process: “For this reason, RIA is, in many countries, closely linked to processes of public consultation” (OECD 1997, p. 17).

However, participation is not an end in itself. Through participation, valuable information is contributed to the process because groups that are outside the policy making sphere can add information to the topic and, in particular, risks are put on the table and are discussed. Furthermore, stakeholder participation increases the legitimacy of public action (Radaelli 2010). Yet there is another aspect that is especially important in developing and transition countries: “RIA has become one of the methods through which societies speed up learning. Because it is an open and consultative technique, RIA stimulates social learning, in which various stakeholders involved in the issue gain a clearer sense of the options, and trade-offs, and the consequences of the solutions, than in the past.” (Jacobs 2007, p. 18). The aim of stakeholder integration is a key aspect of RIA but is also very ambitious and, if transferred into practice, results in a range of transaction costs. Furthermore, stakeholder integration is often limited to stakeholders that have the respective resources or have been involved in such processes before (Turnpenny et al. 2009). Two key research gaps can be identified here: What are factors of success for established RIA in East European transition countries that are not under the umbrella of the EU and, as such, have i) no pressure to implement RIA and ii) often not enough support for the development and implementation? There is another research gap regarding the incentives of civil society actors to engage not only in everyday political decision making, but especially in RIA processes. This is important for tailoring the respective processes and tools to be effective.

Global Environmental Assessments (GEAs) have emerged over the past three decades as a process to help satisfy the increasing demand for scientific knowledge to support decision making related to

global environmental changes. Some of the earliest GEAs conducted concerned ozone depletion, acid rain and climate change (Clark et al. 2006). GEAs differ from national, sub-national or project level assessments, as they often address environmental issues that are caused by or have implications for stakeholders across important political or jurisdictional boundaries. GEAs are generally mandated by intergovernmental panels consisting of representatives of some or all national governments, with many employing an integrated assessment methodology (Holman et al. 2008, see also UNEP/IISD 2009). The GEA process is often overseen by one or more boundary organisations, which can be broadly defined as institutions spanning “the interface between communities of experts and communities of decision makers [at multiple scales]” (Cash et al. 2003, p. 8096; see also Guston 2001; Miller 2001). Examples of boundary organisations of relevance to GEAs as discussed here include the United Nations Environment Programme (UNEP) and the Food and Agriculture Organization (FAO).

The product of a GEA, the assessment report, is clearly important as it can feed into international negotiations regarding environmental decision-making, raise awareness of environmental issues, serve as a teaching tool, and influence agenda setting in national political debates. However, the process as a whole can be seen as equally significant since GEAs are interdisciplinary by nature and often prioritise capacity building, involving stakeholders with expertise in diverse disciplines working together to produce a final report (Clark et al. 2006; Farrell et al. 2006). At the global level, these stakeholders most often include expert scientists and government representatives, but can also include representatives of non-governmental organisations (NGOs), business or industry interests.

Upon reviewing the literature, it appeared that there were multiple research gaps on the topic of engaging with stakeholders when conducting GEAs. These can be grouped into two fundamental concerns, namely who could be considered a stakeholder and how they could participate in the GEA process.

The first major research gap that emerges when examining stakeholder participation in GEAs is that there is no generally applicable and agreed-upon definition of who should be considered as a stakeholder. In this sense, the definition of the term ‘stakeholder’ can be seen as highly context-dependent, and distinct definitions have emerged in literature analysing stakeholders in different assessment contexts (for examples, see Eckley 2001; Andonova 2006; Reed 2008; Scoones 2009; Salter et al. 2010). This fundamental lack of a definition is observed not only in the literature, but also within assessment processes. Even in cases where stakeholder participation is mandated in a GEA, for example in the fifth Global Environment Outlook (GEO-5) and in the International Assessment of Agricultural Knowledge, Science and Technology for Development (IAASTD), no specific definition of what the term ‘stakeholder’ refers to has been provided in the mandate or scope.

Thus, a definition is by default left up to the discretion of assessment authors and producers once the process is already underway. This results in inconsistent definitions of stakeholders amongst different assessments, and even within the same assessment.

The second major gap in the existing research on stakeholder participation in GEAs concerns translating the theories produced on this topic into practice. Some empirical studies have demonstrated that engaging with stakeholders, and in particular with policy makers, can increase the overall success of the assessment process as measured by its legitimacy, salience and credibility (Andonova 2006; Mitchell et al. 2006; Selin 2006). Thus, despite the high costs associated with participatory approaches, stakeholder participation may be considered as a worthwhile exercise for assessment producers to undertake. However, research is lacking regarding what specific formats have been employed in the past to engage with stakeholders in GEAs and what lessons can be drawn to improve the selection or design of future formats. Previous studies on GEAs have shown that “more participation is not always better” (Jäger and Farrell 2006, p. 291) and have reviewed some options for participatory exercises at the global level (Andonova 2006). Other studies have analysed key aspects of different participatory methods in assessments at the national or sub-national level (Hisschemöller et al. 2001; Webler and Tuler 2006; Salter et al. 2010) and others still have explored methods for stakeholder participation in environmental management and decision-making at a global scale (Bäckstrand 2003; Reed 2008). However, no explicit comparison of formats for stakeholder participation in GEAs with the goal of learning lessons for the future has been attempted to date.

Case studies on stakeholder participation in different types of IA

This section presents three selected case studies on stakeholder participation in the different assessment types, introducing the specifics of the cases and the ways the research gaps are approached.

EIA in Poland

The research project presented here is inspired by comparative social science and social psychological studies. It seeks to understand the processes by which the knowledge on how to transpose European legal provisions on EIA stakeholder participation and on how to apply them domestically is transferred by individual agents of change, so-called socialisers. It is argued that socialisation processes have had differential effects in Poland and Lithuania, a fact that has been overlooked to date by EU compliance research.

For the purpose of this paper, Chodorowska argues that EIA has been carried out very differently across the EU Member states, including variations in stakeholder participation. These differences still need to be fully understood. Drawing on empirical findings about compliance

laggard Poland, based on anonymous interviews with regional as well as national Polish EIA officials during the years 2012 and 2013, the milestones of the evolution of EIA stakeholder participation in Central Eastern Europe shall be reconstructed as a first step necessary to deepen the understanding and to account for possible factors of EIA compliance variance across the European continent.

Ekologicheskaya Ekspertiza in Poland – Soviet-style EIA until 1989

During Soviet times, input to EIA exercises by societal groups was restricted, and public decisions were reserved for politicians and experts. Instances of environmental damage would not be made publicly known (Govorushko 1997). Accordingly, public participation was not an element of internal government procedures. In Poland, the nontransparent and content-driven so-called Ecological Expertise [Ekologicheskaya Ekspertiza] fixed the terms of conditions for proposed projects that could affect the natural equilibrium of the earth's surface. On the one hand, legislative provisions would define the conditions which had to be applied in the decision making procedure, on the other hand they would include the principles that would provide for the documentation of relevant environmental information.

While Western understanding would consider EIA documentation as a mere report that constitutes only one element of the participatory assessment procedures, the focus of the Ecological Expertise approach would be to identify EIA documentation as EIA itself (Deja and Kram 1993).

Along these lines, environmental assessments in Central Eastern Europe were based on the understanding that the authorities responsible for environmental assets would take care of the environment, an approach that manifested itself in manifold ways. For example, the documents on the environmental effects of the planned projects, which applicants under planning consent procedures would be asked to deliver, could only be prepared by experts that were listed by the authorities (Tchórzewski 2011).

Reforming environmental assessments in Central Eastern Europe

After the end of the communist era a vacuum had developed in Central and Eastern Europe that needed to be filled with new norms and institutions. Policy-makers and society looked westward for ideas on how to organise their young democracies and market economies. Since the early 1990s international organisations, such as Helcom, the ESPOO Convention or the Nordic Baltic Council, provided venues for mutual socialisation regarding EIA approaches. In this context, Central Eastern European actors learned about Western-style EIA that would consider systematic and transparent procedures for stakeholder involvement as crucial for good environmental decision-making by the authorities. The new expertise strengthened as well as legitimised

³ For a recent example of EIA implementation failures by EU member states, cf. http://europa.eu/rapid/press-release_MEMO-13-907_en.htm

the respective domestic positions of young, educated and eager newcomers to the field of EIA (Cherp 2003; Börzel and Risse 2003). As a result of an institutionalised international transfer of knowledge, supported by an additional differential empowerment of domestic actors via EU conditionality (Schimmelfennig and Sedelmeier 2005), Central Eastern European countries would radically reform their environmental assessment systems and would adjust to the provisions of the European EIA Directive in the context of EU accession preparations during the 1990s.

Public EIA participation in Poland

In contrast to the abovementioned young “norm entrepreneurs” (Finnemore and Sikkink 1998) that have been socialised within international EIA fora, public administrators in Poland that have been socialised during Soviet times adapted slowly to the Western ideals of stakeholder involvement. Not being used to sharing sensitive information with administrative outsiders, at first they perceived the processing of stakeholder inputs as unnecessarily time- and resource consuming as well as a stumbling block for economic development.⁴

A tangible result for the EIA evolution in Poland was the setup of an advisory EIA Commission right after the Polish Round Table talks in 1989. The independent commission of 50 stakeholders from administration, academia and NGOs became headed by a progressive green activist that had been socialised in the United States and Europe that opted for public discussions of investments that could entail harmful environmental effects the environment.⁵

After four years, however, new ministers and new laws led to a “De-Kassenbergization”, the commission began to meet behind closed doors and became politicised. Although, during its first years, the EIA Commission had been open to a wide range of stakeholders and acted in a very transparent manner, there had not been any provisions on stakeholder involvement in Polish EIA-related legislation. Only in 2008 did Poland amend its provisional EIA regulations by incorporating them into the new law on “Access to Information about the Environment and its Protection, Public Participation in Environmental Protection and Environmental Impact Assessments.”

⁴ Interview with Project Officer at Ekoconsult - EIA Project Office and Consultancy, Gdańsk, June 17, 2012.

⁵ Interview with Andrzej Kassenberg, Polish Institute for Sustainable Development, December 18, 2012.

⁶ Interview with Project Officer at Ekoconsult - EIA Project Office and Consultancy, Gdańsk, June 17, 2012.

While the transposition of the EIA Directive into Polish legislation has been achieved after some years of delay, specifically after having introduced wider access to judicial review procedures in 2008 after sustained complaints from the European Commission, the actual application of EIA legal provisions as well as the quality of EIA reports have become a major topic within the community. One interviewee holds that stakeholder involvement today varies according to its context: sometimes it is used as opposition against investments; in some places, stakeholders had a significant effect on the environmental decision, in others they did not take part at all.⁶ Regional officers complain about a

special characteristic of the Polish EIA system that allows stakeholders to appeal environmental decisions without having taken part in any of the pre-decision consultation stages (so-called lack of preclusion).⁷

Moreover, public officers overseeing counties with pronounced surfaces of environmental significance are unable to cope with the amount of workload, but also lack the criteria to evaluate the relevance of public comments, a fact that has not been addressed by research so far.⁸

In sum, after a short revolutionary period of advanced EIA stakeholder participation, Polish politicians became anxious not to scare off inflowing investors and development projects, essentials for the consolidation of the young Polish democracy and market economy. Today, the formal transposition of the EIA Directive into national legislation has been completed. On a legal basis, Poland adheres to the main principles of EIA stakeholder involvement (Polish legislation speaks of stakeholder “involvement at the earliest possible stage”). However, due to the evolutionary pathway, public officers misunderstand these principles as mere procedure, contributing to a gap between the transposition and the actual application of the EIA Directive. Often, the spirit of law is mistreated by using derogative language with regard to public participation (e.g. ‘threat of anarchy’, ‘eco-terrorists’) and reducing it to a formal bothersome routine. These findings are in line with other research that included warnings that international actors should not ignore the political and institutional contexts for the practical application of international EIA norms and rules (Cherp 2003; Falkner and Treib 2008).

RIA in the Ukraine

Regulatory Impact Assessment (RIA) is a key focus within the LIAISE research project where - among others - RIA activities in Eastern Europe were analysed (Adelle et al. 2011). For Ukraine, experts see a great need for improved policy making to advance, for example, water management (Khmelko 2012). Therefore a small project within LIAISE was proposed to analyse the potential of enhancing RIA in Ukraine to better tailor the policies to the requirements of improving water resource management across the state. Although RIA has been introduced as a general requirement for all regulatory acts by the Law on the Main Principles of State Policy in the Sphere of Economic Activity (No. 1160-IV, 11.09.2003) and the Law of the Cabinet of Ministers of Ukraine (№ 950, 18. 07. 2007), research on its uptake in specific areas is missing. The objective of the research is to evaluate the opportunities to further develop RIA as a procedural instrument to improve policy effectiveness in the field of water protection – which according to the IWRM approach demands interregional and international cooperation of diverse administrative units. We will analyse i) what RIA procedures are already applied, ii) what RIA procedures are required for this specific policy field and iii) how the RIA procedure be improved.

⁷ Interview with a representative from the Regional Environmental Directorate, Białystok, April 18, 2012.

⁸ Interview with former Environment Minister, Warsaw, December 19, 2012.

In Ukraine the political and institutional transition is a still ongoing

process. Compared to other East European countries that joined the EU in 2004, the Ukraine did not experience pressure to change its legislation in order to adopt it to European standards. As such, there was no 'window of opportunity' for a clear cut turnaround as it was described above for Poland. As a consequence, the current Ukrainian legal system still embodies parts of the Soviet style. Even though Ukraine is not an EU member state there is a tendency to prove the compliance of new Ukrainian legislation with EU legislation. For example all environmental legislation is supposed to be subject to a test determining if it conforms to EU law. But in practice it is seldom done. From this we can draw the conclusion that Ukraine will not directly take over EU regulations on RIA.

Impact assessment in the form of environmental impact assessment has a history in Ukraine as it was introduced in the former Soviet Union already in the 1980s (Cherp and Lee 1997). The need for RIA is made explicit by Parker and Kirkpatrick (2007, p. 174): "Investors, both foreign and domestic, are discouraged from investing when they believe that regulatory governance in a country is not transparent and is inconsistent and arbitrary and this is the case in too many of the low-income areas of the world." The process of policy making is indeed very non-transparent – in practice, the process differs from what legislation requires especially when it comes to stakeholder integration. One of the biggest research gaps when it comes to policy-making in Ukraine is how the political system really works because informal institutions dominate the political and also the private sphere.

Addressing the research gaps

RIA is a requirement for Ukrainian legislation and there are specific requirements in place that define what has to be done in terms of impact assessment. An example is the analysis of the risks that might result from new or amended policies. However, these are often seen as a "box ticking exercises" and methods for an assessment are seldom applied, even though they are known and available. Interviews⁹ that were conducted in Ukraine to analyse the process of RIA revealed that there is no interest from the government in the development of RIA processes and tools. The same was said for non-governmental organisations. Their interest in engagement is often limited due to their budget and personal capacities. But without such a commitment by these key actors RIA that meets international standards is impossible. Under these conditions, the question arises: What could incentivise the government to introduce an improved impact assessment? In the – at the moment – not very realistic case that actors would be in favour of an improved RIA the question is: How could it fruitfully be integrated into laws and regulations? What processes should be followed and are there tools to be used? Because of the political situation and unclear regulations these processes and tools have to be less complex and ambitious compared to other East European countries, because in the case of too much complexity it might be discarded as unnecessary,

⁹ In the second week of December 2013, 8 expert interviews with stakeholders that work on RIA in Ukraine were conducted. The interviews applied a questionnaire that was already used for other LIAISE country studies and was analysed qualitatively.

whereas in other East European countries there is a driving force – EU legislation. But how could these processes be designed in order to improve policy making without making it too complex and abstract?

In this respect stakeholder participation is a key factor: Stakeholders are integrated into decision making processes, to some extent, one example being the adoption of the “Drinking Water Programme of Ukraine for 2006-2020” where civil society groups were involved (UNECE 2007). But only the larger associations are heard and many smaller organisations do not have the capacities and resources to engage in such activities. The following research questions arise: Are actors integrated in RIA and how are they integrated? Often only the established and well-connected actor groups who are already regularly involved are integrated. The question of participation is crucial – yet in post-communist countries civil society engagement is low because the population is less actively involved in groups or organisations (Howard 2003). How much participation is required – in terms of numbers of involved actors – under such conditions and should it be pushed? Maybe increasing transparency would attract people’s interest since, at present, legislation is often not transparent and rules and regulations are not accessible.

Information that is made public would indeed increase awareness and possibly raise interest. But here another Ukrainian challenge becomes visible, namely that there is a language divide between the Eastern/Southern and the Western part of the country. Even though it seems to be of minor importance in everyday life, it plays a role and documents would have to be prepared in two languages producing additional costs.

The case of GEAs

The project presented here builds off of previous research into GEAs, most notably the GEA Project conducted at Harvard University¹⁰. While this research was comprehensive and provided a great deal of insight into the previously under-researched process of GEAs, research gaps regarding stakeholder participation remain nonetheless as outlined in the previous section.

The case studies to be examined for stakeholder participation approaches in the context of the MCC – UNEP collaborative project are the Global Environment Outlook (GEO) series produced by UNEP, the assessment reports of the Intergovernmental Panel on Climate Change (IPCC), and the International Assessment of Agricultural Knowledge, Science and Technology for Development (IAASTD) co-produced by the Food and Agriculture Organization (FAO), the Global Environment Facility (GEF), the United Nations Development Programme (UNDP), UNEP, the United Nations Educational, Scientific and Cultural Organization (UNESCO), the World Health Organization (WHO) and initiated by the World Bank. Since these GEAs are so lengthy and broad in scope, they will be divided according to the

10 The GEA Project began in 1995 as an attempt to bring together an international and interdisciplinary team of experts in order to better understand the impacts of large-scale environmental assessments on social responses to global environmental change, and how differences in assessment procedures could alter those impacts. The MCC-UNEP collaborative project proposes to go a step further by examining not only the impacts, but also their alignment with objectives and means, and the connection to the political context, in order to continue expanding our understanding of GEAs.

stages of assessment: scoping, content development and finalisation of the report.

Critical stages of a GEA with different meaning for stakeholder involvement

The elements of a GEA in which stakeholders can participate are as diverse as GEAs themselves. Three major stages have been identified in order to organise the case study analysis and be able to draw parallels between assessments. This is done because often the input required from stakeholders and indeed the selection of stakeholders themselves can be quite different depending on the stage of the assessment process. For example, engaging with individuals from the private sector and NGOs may be quite beneficial when developing the content of the report, since they may provide different perspectives on many environmental issues as compared to other groups of experts. However, engaging with these same members of the private sector and NGOs during the development of the Summary for Policy Makers (SPM) document may lead to conflict and unbalanced power relations, as occurred in the case of IAASTD (Scoones 2009). In addition, the objectives for engaging with stakeholders may change over the course of the assessment process. For example, the reason for engaging with policy makers at the earliest stages of the assessment may be to ascertain what they, as a target audience, expect or need out of the assessment. Conversely, when developing the SPM document, policy makers are often engaged so as to ensure government buy-in to the report. For these reasons, it makes sense to compare formats for stakeholder engagement at three distinct, major stages of the assessment: scoping, content development, and developing the SPM. The three stages at which stakeholders may participate in a GEA are detailed below.

In most cases, there is a mandating process for a GEA which consists of a panel or council of government representatives or policy makers who request that the assessment be conducted and specify the general topics to be addressed. There is also often a scoping meeting, at which point the more precise objectives, scope and outline for the assessment are formalised. The attendance at these meetings can be limited to assessment producers, for example the boundary organisation commissioning the assessment, or can be broader and involve policy makers, expert scientists, as well as representatives from NGOs, the business sector and industry. While some of the initial interviewees have argued for the broadest participation that resource constraints will allow, many conceded that this could raise the complexity of the meeting substantially and may not always be the best option.

Some GEAs, namely GEO and the IAASTD reports, involve a more in-depth consultative stage during the content development of their reports, called regional consultations. The regional consultations generally attempt to convene a broader group of stakeholders with

more localised knowledge, who will be able to provide a regional or sub-regional perspective within the global report. In the case of GEO, for example, the regional consultations entailed determining a list of regional priority environmental issues as well as accompanying internationally agreed goals whose achievement would improve the problems associated with these issues. This process has been criticised by some authors during interviews conducted to date for being insufficiently ambitious in its objectives given the resources required to convene the group of stakeholders. In both GEO and IAASTD, the regional consultations served as input into regionally disaggregated chapters in the final report.

All GEAs undergo some form of review process, often involving a round with government reviews and a second round that is open to a broader public. These review processes differ depending on the treatment of comments by authors and producers of the GEA, how transparent the review and commenting phase is, and which stakeholders have the opportunity to comment. Finally, at the very end of the assessment process, the Summary for Policy Makers (SPM) document is negotiated. In all three cases mentioned here, the SPM is negotiated line-by-line and must be agreed-upon by all governments involved. During preliminary interviews with assessment authors, this procedure has been criticised for being lengthy and for weakening some statements. However, the SPM is also considered one of the most important outputs from the GEA process since it directly addresses policy makers and is viewed by them as highly legitimate after governments have endorsed it.

Addressing the research gaps

In order to address the research gaps highlighted in section 2, interviews will be conducted with authors, producers and the target audience of the GEA case studies under review. The latter group is quite diverse, and will include interviews with NGOs, academics and policy makers at different levels with an emphasis on achieving a geographic balance of interviewees. In addition, workshops have been held with UNEP staff who have worked with GEO in the past, in Nairobi in August 2013, as well as with authors of GEO with extensive assessment experience, in Berlin in October 2013.

A crucial first step towards addressing the research gap concerning who should be considered a stakeholder will be to demonstrate the importance of defining this term. This can be accomplished using document analysis to show the inconsistent definitions of stakeholders within and between assessments, as well as using qualitative information from interviews and workshops. To further address this gap, it would be practical to develop a systematic typology of stakeholders in GEAs, which has not been attempted to date. This would involve classifying stakeholders into groups based on characteristics such as capacity to participate in the assessment process, contributions to the process, educational backgrounds and interests, and the stages of

the assessment during which different stakeholders have traditionally participated. Such a typology could help to develop a working definition of who has been considered as a stakeholder in past GEAs, but could also remain flexible enough to apply to different GEA contexts in the future. Creating a typology of stakeholders who could potentially be relevant to GEAs could have practical implications for GEAs in terms of reducing inconsistencies and helping to identify important stakeholders early in the assessment process.

The second major research gap regarding GEAs involves how to design stakeholder participation approaches. This can be addressed by making an explicit comparison between different formats for engaging with stakeholders, verifying whether the objectives of engagement have been aligned with the formats employed. Such a comparison will require an in-depth study of what formats have been employed in the past, what objectives they were satisfying, the resources required for different approaches, as well as a qualitative study of the implications of these formats. Collecting data for such an in-depth analysis may be difficult, especially given that there is relatively little data related to stakeholder participation at the global level and there are no easily identifiable 'success stories.' However, such an approach appears to be a necessary starting point in order to more fully understand the complexities of engaging with stakeholders at the global level and the options available in the design phase of GEAs. Details regarding the formats employed and resources required may be determined by analysing official assessment documents. Semi-structured interviews will be conducted with a large range of individuals involved in different GEAs, including authors, producers, reviewers, policy makers and others, in order to establish the implications of different stakeholder participation formats.

By increasing the body of knowledge concerning who constitutes a stakeholder and how they can participate in a GEA, the research gaps identified here will begin to be addressed. This research can also be beneficial to assessment producers and help to improve the design of future stakeholder engagement exercises in GEAs by providing information on what has worked, or not, in the past. Given the diversity in GEAs, both regarding who has been considered as a stakeholder and the different mandates to engage, attempting to produce a generally applicable set of best practices for stakeholder participation may not be a productive endeavour. Rather, presenting a summary table with different options for participation along with their implications and resource requirements will allow those designing GEAs to select the most appropriate format or combination of formats given the context. Furthermore, presenting the results in such a table will facilitate the alignment of objectives for engaging with stakeholders and the means employed to do so.

Conclusion

The participatory ideal for impact assessment has significantly evolved during the last three decades, yielding a specific normative perspective on the democracy-enhancing features of involving stakeholders systematically into environmental decision-making. Key rationales that have been determined for stakeholder participation are basically the same across our three different case study contexts. First and foremost, integrating individuals, societal groups and organisations into decision-making processes aims at improving the legitimacy of impact assessments. An assessment can be perceived as legitimate when potential users “believe that the information was produced by a process that took account of the concerns and insights of relevant stakeholders, and was deemed procedurally fair” (Clark et al. 2006). Secondly, the assessment systems’ results can become salient to stakeholders, if, and only if, they “believe that the information is relevant to their decision making” (ibid.).

Having reflected on the premises of participatory approaches during the LIAISEoffspring Workshop, we however came to the conclusion that a more critical stance on the normative rationale for participation should be assumed. This is due to the fact that the scientific community has not yet answered our research questions convincingly, specifically in relation to the hidden biases inherent to participatory solutions that are inspired by rationalist approaches. Especially, we would like to encourage future research to help specify the underlying power structures that might govern the selection of participants and of information in the respective assessment processes.

In this regard, our chapter aimed at making an inventory of the literature on stakeholder participation as well as our empirical data on involving citizens in the context of three different types of impact assessments. We have found that, in fact, stakeholder participation differs considerably among the assessment types and identified what we consider to be the most urgent research gaps. Our own research constitutes an attempt to fill in this void.

Concerning environmental impact assessments across the European Union, stakeholder participation is regulated by Art. 6 of the European EIA Directive. However, compliance of EU member states with the directive has not been researched extensively. In particular, there is very little research on public participation in EIA in CEE, especially on the evolution of EIA systems and their interaction with the political and institutional context. One important aspect for analysis is the scope conditions for persuasion processes: Do socialisation effects account for compliance variance within the new EU member states?

Regarding RIA and stakeholder participation in Ukraine, the political system needs to be studied further; it is so dominated by informal institutions that knowledge on how to install a RIA under these

conditions is a huge research gap. Other research gaps relate to incentives to improve the impact assessment system: What could be incentives for the government to reform the system? What role could stakeholder participation play in this process and how could a practical RIA look like?

Stakeholder participation on the global level is less researched than the other two types of assessment. Two urgent research gaps have been identified. Firstly, there is no generally applicable and agreed-upon definition of stakeholders, which is not only an academic problem but also leads to inconsistencies in GEA practice. The second important research gap concerns the translation of the existing theories on the subject into practice.

While we have seen that stakeholder participation has an important role in all three types of assessment, there are major differences concerning the existing research as well as the problems addressed in different types of assessment. For example, the major research gaps for stakeholder participation in GEAs, concerning who the major stakeholders are and what the best methods with which to engage them could be, have already been addressed for EIA and RIA (Reed 2008). For Ukraine, institutionalisation is a major issue which is not as problematic in the case of Poland where compliance has been promoted via EU legislative, enforceable prescriptions. In addition, specific institutional arrangements in Poland, such as the lack of preclusion, derive from specific actor constellations and path-dependent choices that may not be existent in other countries and types of IAs.

Thus, concluding, we hold that different contexts and requirements of IA stakeholder participation result in weak transferability of lessons learned for each individual assessment type.

Chapter 3: Research Gaps in IA modelling

Ayla Alkan, Daan Kolkman, Jaap Rozema, Luisa Sievers, and Pauline Riousset

Introduction

This chapter of the innovation report focuses on mathematical models as tools for policy formulation and in particular for impact assessment (IA). A dominant perspective on mathematical modelling in the chapter focuses on computer-based and simulation models, which are simplifications of reality through equations and aim to reduce complex natural and social phenomena, ultimately to better understand socio-ecological processes. This perspective is pivotal for addressing research gaps in modelling, as one particular method in IA amongst other quantitative, qualitative and mixed methods. In the context of IA, modelling helps assess the impacts on society, environment and economy both by looking at concrete model results but also by integrating modellers as experts into the policy process.

Models belong to the categories of advanced tools or sophisticated tools which can be used in policy appraisal (Nilsson et al. 2008). They are of particular interest precisely because, they are designed as tools to support decision-making processes in policy realms (Podhora et al. 2013), yet they are rarely used in the daily practices of policy-makers (Latour 2001; Nilsson et al. 2008; de Ridder et al. 2007; Hertin et al. 2007; Jacob et al. 2008; Bäcklund 2009). Some reasons have been discussed in the scientific literature to explain the lack of use of advanced tools by policy-makers, such as the risk-averseness of policy-makers who prefer to use tools which have a good track record of use (Thiel 2009). Plausibly this can be explained inter alia by turning to the absence of technical expertise of policy-makers in running complex tools (Turnpenny et al. 2009), or more generally organisational routines and standard practices (Nilsson et al. 2008).

If the deployment of models in policy-making depends on the modellers' ability to meet certain expectations, ensuring a high degree of generality and scientific credibility is for them critical. Yet, this challenge has been neglected in the literature, in tandem with the question under which conditions models succeed in providing essential decision-support. In this innovation report we therefore argue for a better understanding of the contexts of use of models so to provide modellers with one exemplary analysis of the many potential interfaces existing between models and policy-making.

This section is the result of the discussions of an interdisciplinary group comprising three social scientists analysing the use, applicability and normative aspirations of models in policy processes (Daan Kolkman, Jaap Rozema, Pauline Riousset) and two modellers involved in developing and applying models to analyse different policy strategies. Ayla Alkan works on developing a model which determines optimal combination of several agricultural practices to mitigate national

greenhouse gas (GHG) emissions in Turkey. Luisa Sievers works on integrated assessment of German national long-term strategies in energy and transport policy.

In this chapter, we present three major research gaps: a typology of contexts, the history of successful models and the epistemology of the model-policy interface. After the introduction, the chapter proceeds by discussing the importance of the contexts in which models for IA are used or could be used and the lack of research about them. Subsequently, we discuss the epistemology of the model-policy interface. Then, we discuss the need for more empirical research on the conditions under which models succeed in being used in the policy process. Finally, we present the perspective of a young modeller, Luisa Sievers, on the science policy interface of the ASTRA model. This particular model can be considered exemplary in multiple facets, including its wide applicability in the policy domain and broader normative concerns. We finish the chapter with some concluding remarks. Altogether the chapter results from a concerted effort undertaken by modellers and social scientists working on modelling and science-policy as well as science-model interfaces.

The contexts in which models are (potentially) used

Nilsson et al. (2008) argue that during the twentieth century the issues facing policy-makers have become increasingly complex. In addition, they suggest that dealing with such “wicked” problems requires policy to be grounded in a strong evidence base. Such an evidence base can be collected in several ways. Modelling is one of these ways. In a first section, a young modeller, Ayla Alkan, presents her own perspective on the science-policy interface based on her experience with modelling, which largely reflects technical considerations. After that we step back to reflect on the important dimensions a model could take into account to benefit several contexts of use.

Technical considerations

Before starting the analysis of a particular issue, policy-makers have to decide which analytical approach they want to take. There may be several steps of searching and evaluating before deciding which institute, university or firm to work with and before selecting an appropriate method. Understanding the aim of end-users helps modellers decide which types of data to include in models. It may be thought that policy-makers decide about data, but this decision is generally made by modellers. Understanding the aim of the analysis thus helps understand the data requirements but complexity is the really important issue. Quite obviously, modellers want their model to reflect real world as much as possible. At this point, modellers confront commonly known trade-offs between complexity, time and resources.

Decomposition is used to handle the problem more easily. A good decomposition helps decreasing the time and resources needed, and gives a solution closer to optimal solution. There is not a general procedure for decomposition. Different problems require different

ways of decomposition. Then, modellers ask whether a problem could be solved in polynomial time or not. If the problem cannot be solved in polynomial time, they leave it aside and look for a solution in other techniques than mathematical modelling. If it can be solved, they investigate whether they can obtain an exact solution or not. This consideration leads modellers to decide what type of algorithm they should choose, an exact algorithm, or a meta-heuristic or heuristic algorithm.

In addition, as the operation capacity of computers has improved over the last decades, complex models can now be solved fast and effectively. This development allows for making fewer assumptions, solving for more than one objective, transition from partial solutions to general solutions, and from deterministic input to stochastic input.

As mentioned before, modellers try to reflect real world as much as possible. Reflecting the real world more closely means an increase of the data size requirements. Availability, convenience and correctness are important topics in relation to data. Correctness of data can be managed by taking data from trustworthy sources. Convenience of data is some more difficult problem. Finding own data for all aspects of a case is not usually possible for big cases. For some aspects, modellers may have to use external data. Modellers should carefully search for convenient data and make some corrections on data before using it. When correct data could not be found, or there is data but it differs too much from the structure of the modellers' case, modellers have to gather data by themselves.

Another topic relates to multi-objective models. As we mentioned before, in policy making, multi-objective models are usually applied. Being careful about catching a balance between objective functions is very important. If one objective function includes all aspects and the other does not, this leads to biases in the results.

Towards a typology of contexts

Ayla Alkan introduced several considerations surrounding the decision to use modelling as a tool in policy making. As Ayla's experience shows, the development of a model is highly dependent on the expectations and constraints of both modellers and researchers. These expectations and constraints are only one concern in the science policy interface issue.

In addition to this challenge, the boundary between science and policy can be difficult to deal with for simple reasons. Modellers in impact assessment and policy appraisal traditionally work with the ideal of value-free science and objective knowledge (Owens et al. 2004). However, in order for information to be effective, it has to be salient, credible and legitimate (Farrell & Jäger 2006). Major trade-offs and tensions appear between these three requirements (e.g. Sarkki et al. 2013; Cash et al. 2002), for instance between the need for information to be salient (i.e. considered relevant by the target groups) and the

need for scientific credibility. If a model is built in close interactions with policy-makers, and the modellers adopt their views and their priorities, they run the risk to be critiqued for not being scientifically credible. On the other hand, if the model is built without any contact to the policy process, it may end up not being relevant to policy makers and therefore useless. This is why models tend not always to take fully into account the contexts for their application, or tie in with the prevailing norms in specific user environments (Van der Sluijs 2002). A context of use of a model can be characterized by various dimensions such as the institutional culture, the policy domain or sector (e.g. energy, agriculture, health), the backgrounds and experiences of the policy officers employing models and their results, their capacity to use more or less complex tools with or without a Graphic User Interface or visualization tools (e.g. GIS software).

Our assessment of the scientific literature leads us to call for more research on typologies of contexts based on their most critical dimensions and on the extent to which the dimensions of a context are or not taken into account by modellers during the development phase of a model. In particular, the following research questions are worth being investigated:

Who decides what aspects of a system are included in a model?

We believe that what is included in a model, particular dynamics of characteristics, determines its functionality and thereby the options for its use. Up to now, it remains unclear whether the end-users possess the relevant technical knowledge to decide how a particular system should be modelled; the modellers however might not have enough domain specific knowledge and information about the important dimensions of a context of use to be considered. Further research on this question would contribute to our understanding of the interplay between modellers and model users.

Which elements of a context of use should models take into account in order to be policy relevant and, conversely, which aspects should be let aside to maintain credibility?

The adoption of a model depends on more than just the capabilities of the model itself. Little is known about what influences model adoption and use and how model use can be facilitated to the policy maker. A typology of contexts, starting from dimensions such as the ones described above, would help to analyse what kinds of tools can be used, in which contexts and therefore would help to better match models to the policy context in which they could be the most useful.

Who exactly are “policy-makers”, “policy officers” and “end-users”?

Within our group, we find that there is a divergence of views and terminology pertaining to those who use models in policy making.

Further investigation could focus on determining who actually uses models and what their role in the policy making process entails. A typology of end-users/policy-makers/policy officers would help modellers to better know how to target contexts of use.

How does the use of models fit in the daily practices of policy officers?

Models can be perceived as tools that are intended to support policy makers in their daily practices. In order for models to be effectively instrumentally used, we have to develop an understanding of why particular policy officers use models for specific tasks and not others and how their development is supported on the long-term. Following from the previous question, it is to be expected that models are used for several purposes. The differing purposes of models are tied up with their use in different contexts: what are the links between the purposes of a model and their contexts of use?

Can models be transferred from one context to the next?

If we accept that model use is context dependent, this implies that transferring a model from one context to another might be problematic. From a business perspective, transferring or adapting a single model to different contexts might be economically attractive. Further investigation could uncover the situations in which the transfer of models is, or is not, viable. It is important to assess whether models are context-specific or whether their truth claims can be generalized and made universal. In particular, research on scientists' positions regarding main paradigms and framing of problems to be assessed is highly needed. They can relate to concepts such as 'green growth' or consumption policies as a means to reduce climate change or not, and whether certain actors do not consider these a viable option (e.g. Audsley et al. 2010). A problem is usually framed very differently depending on the communities they are framed by, their perception of the political economy, power of different actor groups and need for redistribution of benefits (Jacob et al. 2013). Empirical research on the premises and assumptions on which models rely is therefore highly needed.

The epistemology of the model-policy interface

At the boundary between policy relevance and scientific credibility it is pertinent that questions be raised about who supports the use of a model and the transposition of modelled outcomes into policy. Organizations that are active on the boundary of science and policy are examples where the interests of the modeller and policy-maker converge (Guston, 2001). Yet the professional interest of the external specialist organizations, without any political or partisan connotation, sits uncomfortably in a field where policy decisions are made. These questions are epistemological inasmuch as the contingent ways in which models and their outcomes are used for influencing policy decisions are mediated by something beyond the professional remit of

modellers (see for instance Hulme and Mahony 2010 on the case of the IPCC). As it is unlikely that modellers work in isolation from their policy clients, or that they are prescient of the demand for policy or public relevance of their work, they make constant considerations as regards the relevance/credibility dichotomy.

It is important to assess whether models are context-specific or whether their truth claims can be generalized and made universal. Empirical research on the premises and assumptions on which models rely is needed. In line with this, general inquiry into every related aspect to the practice and empirical realities of models, modelling and modellers is necessary. There has been little empirical investigation into the actual use of models in non-academic contexts. This is problematic considering that model use is considered to be a context-dependent practice. In addition, models are used to underpin decisions that involve millions of Euros of spending.

However, potentially more problematic is the conventional way in which models tend to deal with uncertainty. Uncertainty management is a thorny issue in the use of modelled outcomes in impact assessment, not least because blind spots in the assessment show that reality is invariably more complex than its representation. To be defined as “any deviation from the unachievable ideal of completely deterministic knowledge of the relevant system” (Walker et al. 2003: 5), a systematic appraisal of uncertainty helps shed light on the various forms of uncertainty in impact assessment. Besides, modellers will find different ways to circumvent outcomes that are weakened by uncertainty. ‘Bayesian’ probability estimates and likelihood functions may be necessary when the model is used in an inductive research strategy (McKeown 1999; see Hacking 1975 for a treatise on the subject). This means that reality is construed based on what empirical data reveal.

Following all that is said above, the authors have identified a number of questions that go to the heart of the matter. The questions deal with the epistemological ‘content’ of models in that, in some cases at least, modelling practices in IA are normatively appraised as superior to other methods (cf. Cashmore et al. 2010). Strategic or political motivations may well underlie the production and manifestation of evidence, particularly when the ‘cold authority’ of science is called upon. Of course, this does not necessarily question the integrity of modellers but rather demonstrates the machinery of the model-policy interface which may come to surface in IA. The following questions put this intellectual inquiry centre-stage:

Is the model constructed in such a way that it creates bias?

A model may be used for political-strategic reasons and it may favour certain characteristics – possibly at the expense of others. Modelling practices may induce outcomes subsequent to established interests. This point has been prominently manifested by Richardson (2005,

p.354), who investigated an environmental impact assessment (EIA) for infrastructure development and concluded that the model supported only a “narrow range of infrastructure based policy options”. Yet the technical considerations made in the development of models might not necessarily be consciously aligned to achieving particular ends.

When, exactly, is a model authoritative?

According to Cashmore (2004, p. 411), “modelling techniques should be employed to quantify, wherever possible, the characteristics of impacts”, subsequently attributing this objective to the ability of models to make authority claims in impact prediction. Yet when, if at all, do models speak truth to power? It is important to conduct research on the claims of models which exert scientific authority, which are renowned and largely used in the scientific community and beyond. Yet the model cannot speak for itself; it has to be supported by people. That is, people have to believe in the truth claims exerted by models for them to become authoritative. This beckons inquiry into those who support a particular model, potentially at the expense of rival models. What are the conditions under which a model gains in scientific authority within and across communities?

What are the financing structures of models?

Those with a vested interest in research outcomes will more likely fund some models at the expense of others (which may lead to ‘unknown unknowns’, as an expression of normative uncertainty, see Biermann, 2007). How are research funds allocated to models? What are the criteria for quality research? How do research funding organizations, research institutions and policy consumers of research interact around the development of models?

What do policy-makers want with regard to models?

Policy-makers have little time and may not have the required resources (expertise and time) to assess a model rigorously to identify the suitability of the model for their purposes. It is therefore pertinent to look at how they deal with models. Policy-makers are numerous and very different; they work in different policy contexts and on different topics. This opens up to interesting investigation, not least dealing with what kinds of supporting evidences and/or tools (e.g. particular software) to elicit meaningful information from uncertainty are necessary. In which cases do policy makers want to use a model themselves and when is it more convenient for them to have developers also apply the model for their purposes?

How can modelling be combined with other evidence sources?

As stated earlier, modelling is but one method in IA and other domains policy relevant decision-making. Hertin et al. (2009) have made explicit

the need to reconcile modelled outcomes preferably with qualitative methods to support the evidence base of regulatory impact assessment (RIA), which is a specific type of impact assessment. Arguably, this provides further impetus to the rejection of linearity in the model/policy interface. If several forms of evidence are used in the policy process, what kinds of evidence in concert with their meaningful real-world contexts play a role in the decision making process and how do they combine with each other? How does evidence from models combine with other sources of evidence.

History of successful (and less successful) models

Many modellers are frustrated to see their models and research not used in policy processes, not used enough or not used in the ways they had imagined (cf. McIntosh et al 2007). While there has been some research on the subject of model use, some scientists argue that research on the use of models is still at its infancy (e.g. McIntosh et al. 2007) and that this research field has failed to progress over the last decades (Syme et al. 2011). Despite the large amount of research funding available for IA tool development, for instance in the European Union (Podhora et al. 2013), only some models have been used profusely in policy-making arenas (Nilsson et al. 2008, Thiel 2009), among them the CAPRI model in the agricultural sector or the PRIMES model in the energy sector at the European level; the others remain RANAs (not applicable applied research or in French “recherche appliquée non applicable”) (Latour 2001). Next to rare analysis on the conditions under which computer-based support tools are used (McIntosh et al. 2007), only the scientific and political history of the GAINS model on the mitigation of air pollution has been analysed thoroughly (Hordijk 1991). This is why we urgently need analysis of the conditions under which computer-based models are successful in being used in policy-making arenas (see e.g. Brugnach et al. 2007). For that, research is needed on both models that have failed to match the expectations regarding their use by decision makers, despite a strong investment in the science policy interface, as well as on successful models.

Successful models can be found in various kinds of settings, for instance:

- The IMAGE model in the Netherlands – used for United Nations Framework Convention on Climate Change negotiations/ Intergovernmental Panel on Climate Change, accepted tool for the Netherlands National Institute for Public Health and the Environment (RIVM)’s main national products. The model was developed by the Netherlands Environmental Assessment Agency (PBL) as a scientific project and specific tools, more targeted, with a reduced run time and less detail, were derived to serve specific policy purposes.
- The ASTRA model (see section 5).
- (Simple) tools used to support participatory foresight exercises. For example the ClimaTerre used by the Centre for Studies and Strategic Foresight, of the French Ministry of agriculture in the foresight “Agriculture Energy 2030”.

Analysing successful and less successful models would help to understand the dimensions of the science policy interface, what we call a context of use, which are critical to the use of a model. In particular, our analysis of the scientific literature finds that the following research questions have been neglected and would be worth investigating to enhance the usability and possibly the use of models in policy-making arenas:

What kinds of impacts have models had on policy formulation and adoption?

Analysis on whether a model has been used and to what extent it has influenced the policy making process in a particular setting is required. Evidence about this question would allow us to better understand the role and impact of a model within policy making and what can be realistically expected from different types of models.

Which factors led to the successful application (analysis of their rise to the top) or lack of application of a model?

By determining what factors contributed to the success or the failure of a particular model, we can deepen our understanding of the elements which aid the use of models.

How do modellers reconcile the need for scientific credibility and policy relevance?

Cash et al. (2002) propose that there is a tension between scientific credibility and policy relevance. Analysing these trade-offs in the case of modelling would provide insight into the possibility of balancing different competing needs regarding model use.

For successful models: how did the modellers keep track of policy evolutions and stay relevant to policy audiences?

This question could provide insight into how modellers manage to “sell” their model to a relevant audience and keep that audience interested in this particular model. Furthermore, it would advance our knowledge of what factors determine the success of models in maintaining use in the longer run.

Which role do boundary organizations play in supporting and influencing the model if any?

This question focuses on the role of different organizations in supporting the adoption of a particular model. It could help to shed light on how the model development process can be organized to maximize the odds of the model being adopted.

On which resources have the modellers relied for the maintenance

and adaptation to the policy context?

In policy making contexts, resources are scarce. We suggest that in order for a model to be maintained the modellers have to secure such scarce resources. This question aims at looking into the kinds of resources (time, money, expertise) modellers need and the strategies they use to secure them.

Perspective of an early career modeller

The following perspective is one of a young researcher, Luisa Sievers, who is working on the development of ASTRA and who applies it in the context of long term strategies in transport, climate and energy policy. It contributes with practical experience to the research gaps described above.

The ASTRA model (Schade 2005; Hartwig et al. 2012; see also www.astra-model.eu) is an integrated assessment model, which has been applied for more than 10 years for strategic policy assessments in the transport and energy fields. The model is based on the System Dynamic Approach and runs until 2050. It covers the 27 countries of the European Union, as well as Norway and Switzerland, and integrates nine modules linked together in manifold ways: a vehicle fleet model, transport model, emission and accident models, population model, foreign trade and economic model with input-output tables, government, employment and investment models. A strong feature of ASTRA is the ability to simulate and test integrated policy packages and to provide indicators for the indirect effects of transport on the economic system. ASTRA is developed and maintained by Fraunhofer Institute Systems and Innovation Research (ISI) and TRT Trasporti e Territorio Srl.

Within the ASSIST project (www.assist-project.eu) a dedicated version has been developed for the European Commission including a graphic interface for application of the model and visualisation of the results. Before that, the model had already been used in many European research projects (DG Energy and Transport, DG Research and Innovation). There is also a German version of the ASTRA model (Hartwig et al. 2012) to assess national policies, in particular of the Federal Ministry of the Environment.

Political institutions (e.g. German Federal Ministry of the Environment, European Commission) finance the greatest part of research projects which involve the ASTRA model. Most of the application and development is based within those projects. Strategic (e.g. self-financed) development of the model should hence consider future application needs.

Due to time and budget constraints in research projects within a political context, the modellers partly have to work with pragmatic solutions which may be questionable from a scientific perspective. But not only constraints might force them to do this. There might be a

political need on the one hand (e.g. to integrate all new Member States into a European model) and a lack of data to do this properly on the other hand. Sometimes political institutions demand to establish the coherency of certain model variables with the results of other research projects or with a politically agreed development path which might be contradictory to the inherent structure of the ASTRA model. Further examples could be added.

The multidisciplinary team of modellers is based at Fraunhofer Institute for System and Innovation research ISI, an institution conducting applied research. Thus, each researcher has an interest and need to produce scientific output (peer reviewed papers, PhD theses). The challenge of writing the proposal for a PhD thesis is to have an overlap with an existing research project within a political context on the one hand, and on the other hand to further develop and apply the model in a strategically sensible, personally fulfilling way while addressing a scientific research gap. Especially with external supervisors of the thesis, pragmatic solutions are not so easily acceptable, and PhD students might therefore take an important role in increasing the scientific quality of a model.

At the same time, PhD students with a funding additional to the project play a major role in strategic development of the model. However, at the beginning of their career they mostly lack experience in project work and knowledge about the policy process. Knowing more about the political context of modelling could help in this process of defining a scientifically interesting and policy relevant research question. It could also increase the motivation of young researchers if the relevance of their work is increased.

Final remarks

As modelling becomes more widespread in evidence-based policy making, we need to develop a more thorough understanding of how models are used to inform policy and how policy deals with this information. In this chapter we argue that the adoption and use of models are highly context dependent. In order to make progress, we need a typology of the different contexts that are thought to be of importance to the use of models in policy.

Furthermore, we believe that further investigation into the epistemological status of models in policy is needed to make them 'fit' into policy relevant contexts. For instance, Jaap Rozema has privileged attention to the role of models in the policy-science interface and how purported evidence bases in project development impact upon the legitimacy of modelled outcomes. He has aimed to understand how models make claims exerting to scientific authority and expertise by their embedding in the project context, amongst others in dealing with questions on uncertainty. Pauline Rioussset has empirically analysed computer-based mathematical models for the assessment of prospective policies, which expectations pertaining their use in policy

arenas have not been fully met. In her research, she explores and discusses obstacles to their use and potential improvement pathways. Such understanding could be substantively aided by investigation into models that have previously been successful. Following these lines, Daan Kolkman focuses on the development and use of computational models to inform policy makers. He investigates the application of models in policy settings and aims to identify those characteristics of computational models and their development process that facilitate their use. His work involves following several policy informing models from their inception through development and use in practice.

Luisa Sievers develops and applies a model for integrated assessment of long term strategies in energy and transport policy. She believes that having a better understanding of the role of models in the policy context could especially help young modellers in making their models more relevant to policy-making and increase their motivation. An interdisciplinary discussion is needed and helpful and she therefore attaches importance to sharing her experience in this report. In the same vein, Ayla Alkan researches on developing a model to mitigate total Green House Gas emissions of Turkey by using agricultural methods. She aims to analyse the future actions of the government in socio-economic perspective because the government planned these actions according to physical analysis only. There are very few studies taking social and economic life into account. She plans to make policy recommendations according to the results of the model.

Summary and Outlook

Daniela Chodorowska, Pauline Rioussset and Johanna Ferretti

This Innovation Report assembles the fresh perspectives of early stage researchers from the LIAISEoffspring network, a group of young interdisciplinary graduates, whose research projects are related to the topic of contexts and methods for evidence-based policy making. In order to entangle the premises, gaps in knowledge and verified wisdoms inherent in public policy research, the network members addressed key research themes from the topics of Science-Policy Interfaces, Participation in Assessments, and Modelling as an Important Tool of Policy Impact Assessments.

An overriding aim of the LIAISEoffspring network is to support young researchers analysing evidence-based policy making, science-policy interfaces and policy impact assessment tools and methods, facilitating their academic engagement with one another and encouraging them to confront and compare the contexts in which their research takes place. In this context, the LIAISEoffspring kick-off workshop has shown to the participants quite clearly that different scientific backgrounds and theoretical lenses channel our attention towards distinct units and levels of analysis. As a result, studies on the diverse processes of evidence-based policy-making seem to suffer from not being able to speak to each other directly due to a lack of common language and shared analytical tools among IA academics as well as between IA researchers and practitioners.

The chapter on science-policy interfaces took stock of the different perspectives on the complex interplay between scientific evidence and effective and legitimate policy-making. Further, it identified existing research gaps to be tackled for an enhanced understanding of contemporary challenges for public policy making processes.

Specifically, the chapter's authors argued that contemporary SPI research is lacking in-depth analyses of interactions among SPI actors and structures, and that general frameworks or concepts regarding how contexts could be systematically considered in the design of SIA processes (for any given case) are still missing. Only by diving deeper into actual SPI arrangements can researchers hope to shed light on the influence of different contexts on the specific designs, processes and outcomes of different SPIs.

Following up on the SPI chapter's call for more in-depth analyses, the authors of the second chapter dealt with three different types of assessments (i.e. EIA, RIA and GEA) from the perspective of stakeholder participation. Based on the latest empirical data they have gathered for the purposes of their social science dissertations, they found that the challenges of integrating individuals, organisations and societal groups into the different decision-making processes can

vary significantly according to the respective assessment levels and contexts, a fact that has not been addressed by the under-theorised research on stakeholder engagement. Moreover, the authors identified research gaps that seem to be thematically related despite the contextual differences across their research, such as the gaps between formal transposition and practical application of assessment provisions on the local, national or global level, and the lack of critically-inspired studies on stakeholder participation.

Last but not least, chapter 3 focused on IA modelling, an important tool for running policy impact assessments under the norms of evidence-based policy-making. The authors discussed research gaps surrounding model-policy interfaces and provided some ideas for the academic community to fill in these gaps. First, there is a need for deeper investigation of the contexts in which models are (potentially) used and especially for empirical research on successful and unsuccessful models. Such research would help us understand under which conditions models actually become what they are supposed to be: decision support tools. Second, they also emphasised the importance of analysing the epistemology of the model-policy interface, in particular, the accuracy, authority and transferability of established IA models in different contexts of use. Finally, two young modelers of the author group offered their perception of the interface with policy officers, the target audience of their models and model results, as they have experienced it so far.

To sum up, the Innovation Report, the main output of the first workshop of the LIAISEoffspring network, shows clearly that a more systematic comparison of the contexts under which evidence penetrates the policy process is needed to better understand how science-policy-stakeholder interfaces work and how they could be improved to facilitate 'better' decisions and policies.

In this regard, the LIAISEoffspring network offers an interdisciplinary forum for early stage researchers to take a step back and to consider the bigger picture. It encourages reflecting on existing perspectives and theories as well as on versatile definitions of SPIs and IA. It facilitates positioning one's research within the field and analysing its policy relevance. At the same time, it encourages critical examination of the added value of other vantage points for research and acknowledging the biases of specific theoretical approaches.

Communicating with other early stage researchers who have similar research interests has helped us to understand the complexity of the field, just as the engagement of SPI actors with one another helps them manage the complexity of a given policy issue. Consequently, we conclude that rather than letting frustration with a chaotic field become a barrier, early stage researchers should feel encouraged to explore and utilise the aspects of SPI research that are useful to them. As such, the lessons uncovered in research are also lessons for research.

Our journey has just started and more fresh perspectives are most welcome! As the LIAISEoffspring network is designed to be a long-term venue, we would like to invite you to join us! Will we see you at our next Annual Meeting?

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Biographical information of the authors

Ayla Alkan got a bachelor's degree from Industrial Engineering Department, Yıldız Technical University in 2004. She worked as Business Development and Project Sales Specialist in a private company for three years after graduation. She got a master's degree from Industrial Engineering Program, Institute of Science, Galatasaray University in 2010. She has been studying in PhD Program in Economics, Institute of Social Sciences, İzmir University of Economics since 2010. She is working as a research assistant in the same university. Research fields of her are project management, engineering economics, econometrics, optimization, agricultural economics, and climate change.

Ayla Alkan, Economics Department, İzmir University of Economics, ayla.alkan@ieu.edu.tr

After finalising her MSc. in Urban Development Planning at UCL (London), **Wanda van Enst** started her PhD on 'SPIs and the Wadden Sea' at Utrecht University. The aim of her research is to create a better understanding of when, where and how SPIs within the environmental policy debate enrich decision-making processes, by means of increasing the level of credibility, legitimacy and/or salience of the used (scientific) knowledge. Her empirical research is focused on the Wadden Sea area – an Unesco heritage area where ecological and economic interests are in constant tension with each other, leading to the strategic use and production of (scientific) knowledge.

Wanda van Enst, Copernicus Institute of Sustainable Development, Section of Environmental Governance, Utrecht University, w.i.vanenst@uu.nl

After having received a Diploma in Political Science at the Freie Universität Berlin in 2010, **Daniela Chodorowska** continues to pursue her Compliance studies as a PhD candidate at the Center for European Integration (Freie Universität Berlin). She was trained at diverse institutions, including the German and the Polish Ministries of Environment, the Stiftung Wissenschaft und Politik as well as the Polish Institute for International Affairs. She has been a German delegation member to the COP15 in Copenhagen.

Daniela Chodorowska, Center for European Integration, Freie Universität Berlin, daniela.chodorowska@fu-berlin.de

Next to her PhD **Johanna Ferretti** works as a research fellow at the Environmental Policy Research Centre at Freie Universität

Berlin, mainly on policy IA projects and methods for IA. Prior to that she worked at the Technische Universität Berlin (TUB), on a project developing a GIS-based environmental assessment framework for strategic environmental assessments. She has a MSc in environmental planning (focus on environmental assessments) from TUB.

Johanna Ferretti, Environmental Policy Research Centre, Freie Universität Berlin, jferretti@zedat.fu-berlin.de

Jennifer Garard is a researcher and doctoral student since May 2013 with the working group Assessments and Scientific Policy Advice at the Mercator Research Institute on Global Commons and Climate Change (MCC). She completed a diploma in health sciences in 2005 followed by a Bachelor's degree in environmental sciences from McGill University in 2008, where she specialised in biodiversity and conservation. She continued with her studies in environmental impact assessment at Concordia University, receiving her Master's degree in 2013. Jennifer also served as an intern with the Secretariat of the Convention on Biological Diversity in 2012, working with the Health and Biodiversity Cross-Cutting Initiative.

Jennifer Garard, Mercator Research Institute on Global Commons and Climate Change (MCC), garard@mcc-berlin.net

Anna Gayer and **Dominika Mucha** both are PhD candidates working as professor's assistants at the Faculty of Environmental Engineering in Warsaw University of Technology. Both are members of scientific team working on air pollution influence on human health and took part in national grant titled: Analysis and evaluation of the effects of traffic on the health of urban residents. Anna Gayer gained professional experience taking part in an international project as an intern in CREAL –Centre for Research in Environmental Epidemiology in Barcelona, Dominika Mucha is an Environmental Specialist in Astri Polska (space sector company).

Anna Gayer; Dominika Mucha, Warsaw University of Technology – Faculty of Environmental Engineering, anna.gayer@gmail.com, d.mucha.pw@gmail.com

Anna-Lena Guske holds a diploma in political science from Philipps-Universität Marburg. Besides, she studies East European Studies at Freie Universität Berlin. She joined the Environmental Policy Research Centre (FFU) as student fellow in 2010. Since November 2011 she is research fellow at the FFU and worked on several projects related to policy impact assessment and

sustainability science.

Anna-Lena Guske, Environmental Policy Research Centre, Freie Universität Berlin, anna-lena.guske@fu-berlin.de

Nina Hagemann holds an M.A. degree in political science from the University of Hamburg. In 2008, she joined the Helmholtz Centre for Environmental Research – UFZ in Leipzig, Germany. She works on different projects related to regulatory impact assessment, but also water resources management and governance of the bio-economy. Her current PhD research project is entitled “Understanding institutional persistence in Ukrainian water service provision”. Besides she teaches various courses on topics of sustainable resource management.

Nina Hagemann, Helmholtz Centre for Environmental Research - UFZ, Department of Economics, nina.hagemann@ufz.de

Daan Kolkman is a PhD candidate at the University of Surrey. His main research interests are spatial systems and the application of scientific knowledge to real world public- and private sector policy making. Daan got his undergraduate degree in human geography and planning at the University of Utrecht. He obtained his masters’ degree at the University of Utrecht and the University of Groningen. His specialties include regional economies, transportation systems, business location strategies and real estate. His current research focusses on how, and for what purpose policy makers use computational models.

Daan Kolkman, Centre for Research in Social Simulation, Department of Sociology, University of Surrey, d.kolkman@surrey.ac.uk

Since 2008 **Eva Kunseler** works as a policy researcher at the Netherlands Environmental Assessment Agency on environmental health policy analysis studies. She has a MSc in environmental health sciences from Maastricht University. Previously she worked in WHO coordinated projects developing a European information system on environment and health. Working at the science-policy interface also triggered her academic research interests. Since 2011 she is an external PhD candidate at the Institute for Environmental Studies at VU University Amsterdam. Her PhD research contributes empirical insights on the value and use, risks and challenges of participatory and deliberative forms of knowledge production in an institutionalised science-policy setting.

Eva Kunseler, Netherlands Environmental Assessment Agency, eva.kunseler@pbl.nl

Lisa Pettibone is a PhD candidate at the Freie Universität Berlin's Environmental Policy Research Centre. Her dissertation is focused on the role of three factors – comprehensive plans, sustainability indicators, and sustainability-minded institutions – in defining and promoting sustainability in local political decision-making in six U.S. and German cities. Lisa's research is funded by the Deutsche Bundesstiftung Umwelt (German Environmental Foundation). In addition to her research on urban sustainability, Lisa works for the nonprofit Citizens For Europe e.V. as co-editor of the journal Open Citizenship. She holds a master's degree in public administration from the George Washington University and a bachelor's of fine arts from New York University.

Lisa Pettibone, Environmental Policy Research Centre, Freie Universität Berlin, lisa.pettibone@posteo.de

Claire Range has studied Political Science (MA) at the Free University of Berlin, Ruhr University Bochum and Universitat Autònoma de Barcelona. Her thesis was on Impact Assessment in Germany and the United Kingdom. Before her university education she attained a Diploma as a "Foreign Language Correspondent". Claire passed several internships and has worked as student assistant at Ruhr-University for the Chair "German Political System" for three years. Since June 2012 she has worked as student assistant at the Environmental Policy Research Centre of the Free University where she is employed as research assistant.

Claire Range, Environmental Policy Research Centre, Freie Universität Berlin, claire.range@fu-berlin.de

Jaap Rozema is a doctoral candidate at the School of Environmental Sciences, University of East Anglia in Norwich, United Kingdom (graduation year: 2014). Using his academic background in the political sciences, international development studies and environmental sciences, he focuses on the mutual influence of institutional design and political culture on civic engagement with environmental policy, principally in the context of political and scientific authority. He has taken a key interest in the relational fields between states, civil society and policy trajectories, thereby marrying the political sciences with the burgeoning literature on policy innovation and sustainability transitions.

Jaap Rozema, Science, Society and Sustainability Research Group (3S), School of Environmental Sciences, University of East Anglia, j.rozema@uea.ac.uk, and Department of Development and Planning, Aalborg University, ja@plan.aau.dk

Garrett Richards is an interdisciplinary PhD student at the University of Victoria (in British Columbia, Canada), belonging to both the department of environmental studies and the department of political science. His research interests include climate change and climate science, deliberative democracy, environmental policy-making, and information and epistemology. Previously, he completed a master's thesis at the University of Saskatchewan entitled "Complexity as a Cause of Environmental Inaction: Case Studies of Large-Scale Wind Energy Development in Saskatchewan". His current PhD research project is entitled "Institutional Bridges between Climate Science and Policy in Canada" and entails interviews with climate scientists and climate policy-makers.

Garrett Richards, School of Environmental Studies, University of Victoria, gwr@uvic.ca

Pauline Rioussel is a doctoral student at the Free University Berlin and research fellow at the Mercator Research Institute on Global Commons and Climate Change. Her research interests include science-policy interfaces, policy assessments and the impact of global environmental assessments in policy cycles and beyond. In 2011, Pauline obtained a master's degree from Sciences Po Paris and Université Pierre et Marie Curie (UPMC) in environmental sciences and policy, as well as a specialization in agro-ecology from the French Agronomical Research Institute (AgroParisTech). As part of her bachelor's degree (also from Sciences Po Paris and UPMC), she spent a year at the Faculty of Agricultural and Environmental Sciences of McGill University, Montreal (2008-2009).

Pauline Rioussel, Environmental Policy Research Centre, Freie Universität Berlin, and Mercator Research Institute on Global Commons and Climate Change (MCC), pauline.rioussel@fu-berlin.de

Luisa Sievers works as a scientific researcher and PhD student at Fraunhofer Institute for Innovation and System Research ISI since 2010. Her focus is on integrated, system-based assessment of transport and environmental policies and the further development of corresponding models. She currently contributes to the project ImpRES which deals with distributional effects of renewable energy policies including regional aspects. Her further interest is in analyzing the macro economic rebound effect of renewable energy systems. Luisa Sievers studied physics and economics in Berlin and Heidelberg and obtained her diploma in 2009.

Luisa Sievers, Competence Center Sustainability and

Infrastructure, Fraunhofer Institute for Systems and Innovation Research ISI, luisa.sievers@isi.fraunhofer.de

Pita Spruijt is a PhD candidate at Utrecht University in collaboration with the Dutch National Institute for Public Health and the Environment (RIVM). Her work focuses on complex environmental health risks. Her research interests include dealing with risks and uncertainties in environmental policymaking and advice and, in particular, the role of experts in these processes. Previously, she studied sociology at the University of Amsterdam and at Utrecht University.

Pita Spruijt MSc, Institute for Risk Assessment Sciences Utrecht University & National Institute for Public Health and the Environment (RIVM), pita.spruijt@rivm.nl

