



Stakeholder Interaction in Research Processes

A Guide for Researchers
and Research Groups

**GOTHENBURG CENTRE FOR
SUSTAINABLE DEVELOPMENT (GMV)**



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In many research projects, stakeholder interaction is ad hoc rather than strategic and systematic. This guide provides advice on good practice, strategies and tools for researchers and research groups interested in finding effective ways to involve stakeholders in their research and have an impact on society.

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About this guide

This guide has been written by Daniel Slunge (UGOT), Olof Drakenberg (UGOT), Anders Ekblom (UGOT), Maria Göthberg (UGOT), Åsa Knaggård (LU) and Ullrika Sahlin (LU). It was produced as part of the research project STAKE – Practices and Barriers to Stakeholder Interaction – Challenges for Research Projects, and forms part of the strategic research area BECC – Biodiversity and Ecosystem Services in a Changing Climate – a collaboration between Lund University (LU) and the University of Gothenburg (UGOT). It is an updated and revised version of the one published in 2017. We welcome any comments and suggestions that can help us further improve this guide. Comments can be sent to daniel.slunge@gu.se.

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Contents

1. Introduction	6
1.1 Why this guide?	7
1.2 Opportunities with stakeholder and policy interaction	7
1.3 Key features of this guide – who Should use it and how?	8
2. Why is research often not utilised?	10
2.1 The gap between research and policy-making	11
2.2 Policy-side constraints	11
2.3 Research-side constraints	12
2.4 Bridge the gap between research and policy-making – some solutions	13
3. Two models of stakeholder interaction	14
3.1 The transfer model	15
3.2 The interaction model	15
4. Roles and strategies for stakeholder interaction	18
4.1 The researcher	19
4.2 The researcher group	21
4.3 The research institution	23
5. Tools for stakeholder interaction and communication	26
5.1 Stakeholder interaction when defining research problems and questions	27
5.2 Stakeholder interaction when conducting research	28
5.3 Stakeholder interaction when final research results are available	29
5.4 Stakeholder communication throughout the research process	29
6. Planning for stakeholder interaction	32
6.1 Identify and analyse your stakeholders	33
6.2 Make a plan for stakeholder interaction and communication	35
6.3 Follow-up of stakeholder interaction activities	35
7. Evaluating Societal Impacts of Research	36
7.1 Framework to assess research impact	37
7.2 Methods to assess research impact	39
7.3 Experiences from national evaluation systems	42
7.4 Conclusions	43
Appendix	44
Tool 1: Explaining the essence of your research - The Message Box	45
Tool 2: Who are your stakeholders?	47
Tool 3: Graphical mapping of stakeholders	48
Tool 4: Analysing the authority and interest of stakeholders	49
Tool 5: A plan for stakeholder interaction	51
Tool 6: Monitoring matrix for stakeholder interaction activities	52
References	55

1. Introduction

1.1 Why this guide?

1.2 Opportunities with stakeholder and policy interaction

1.3 Key features of this guide – who Should use it and how?

1.1 Why this guide

There is an urgent need for scientifically grounded solutions to the challenges posed by climate change and ecosystem degradation. While many researchers and research groups put significant efforts into communicating their research findings, there is often scope for improvement in linking research with decision-making processes. In many research projects, stakeholder interaction is ad hoc rather than strategic and systematic. This guide provides advice on good practice, strategies and tools for researchers, research groups and research institutions interested in finding effective ways to involve stakeholders in their research and have an impact on society.

Box 1. What do we mean by stakeholder interaction?

Stakeholder interaction can be defined as the activity of involving and communicating with actors who are potentially interested in, or affected by, scientific studies and their results during the research process and in the communication of results.

For researchers interested in policy change, it may be useful to define a stakeholder as any person or group who has an interest in the research topic and/or who stands to gain or lose from a possible policy change that, directly or indirectly, might be influenced by the research findings.

1.2 Opportunities with stakeholder and policy interaction

A systematic and science-based approach to stakeholder and policy interaction can provide researchers and research groups with opportunities to:

- Improve the relevance of their research through identification of societal problems and new perspectives.
- Enhance the quality of research through improved access to data.
- Effectively communicate with stakeholders to enhance the possibilities that research results come into use and influence decision-making.
- Apply for funding from sources that require researchers to include stakeholders in research projects. (Box 2).

Box 2. Research funding and demands for stakeholder interaction

- Specific demands for stakeholder interaction are made by several research councils, such as the Swedish Research Council Formas and UK Research Councils. They may ask applicants to describe how stakeholders have been identified, to prepare a realistic plan for stakeholder involvement and to describe how the needs of stakeholders and/or end users have been taken into account in the design of a project¹.
- Research projects funded under the European programmes for research and innovation Horizon 2020 and the five so-called European Innovation Partnerships are subject to high expectations for stakeholder interaction.
- The World Bank, DFID, IRDC, SIDA and other development funders often demand an explicit account of stakeholder interaction and policy impact in the research projects they support.

¹ FORMAS supports excellence in research for sustainable development. See e.g. page 36 of Formas Handbook 2015 – for Applicants and Reviewers (Formas, 2015).

- Government agencies frequently call for research projects on specific topics where a structured and frequent stakeholder interaction often is a criteria for funding. The minimum demand is to have an interactive communication with the funding partner and with stakeholders identified by the funding partner.

1.3. Key features of this guide – who should use it and how?

- The aim of this guide is to support researchers, research groups and research institutions with practical advice on effective stakeholder interaction.
- It contains reflective questions about roles and strategies for stakeholder interaction.
- Rather than focusing solely on science communication, there is an emphasis in the guide on understanding the needs and priorities of stakeholders linked to a research project.
- The focus is on influencing policy-making, not on enterprise innovation and commercialisation.

Box 3. The knowledge base of this guide

This guide was produced as part of the research project Practices and Barriers to Stakeholder Interaction – Challenges for Research Projects (STAKE). STAKE was based on a literature review, a survey among environment and climate change-oriented researchers and round-table discussions with senior researchers. The guide also draws on the authors' practical experiences from providing science-based advice to organisations such as OECD, the World Bank, UNDP, national environmental agencies and development cooperation agencies (e.g. www.sidaenvironmenthelpdesk.se), and from supporting larger research programmes with strategies and tools for stakeholder and policy interaction (e.g. www.efdinitiative.org; www.fram.gu.se; www.slu.se/agrifose) as well as the teaching of the PhD course From Research to Policy for Sustainable Development.

Who should use the guide?

The guide can be used by individual researchers or research groups. The guide does not have to be read in chapter order.

In chapter 2, *Why is Research Often not Utilised?* we discuss constraints to effective interaction on the research side and the stakeholder side. This provides a background and rationale for a more systematic and proactive approach to stakeholder interaction.

In chapter 3, *Two Models of Stakeholder Interaction* we discuss the transfer model and the interaction model.

Chapter 4, *Roles and Strategies for Stakeholder Interaction*, reflects on the roles and strategies researchers may have in relation to stakeholder interaction over the course of a research career and within a research group. It also discusses

what research institutions can do to create an environment conducive to effective stakeholder interaction and contains questions for researchers, research groups and research institutions that can assist in developing desired roles and effective strategies.

Chapter 5, *Tools for Stakeholder Interaction and Communication*, gives examples of tools researchers can use when interacting with stakeholders during different stages of a research process.

Chapter 6, *Planning for Stakeholder Interaction*, discusses how to identify and analyse stakeholders, the importance of planning for effective stakeholder interaction and how the outcomes of stakeholder interaction activities can be monitored and evaluated.

The *Appendix* constitutes the toolbox of this guide.

Scientific papers as well as books, guides and other sources of information on the topic of this guide are found in *References*.

Other recommended guides related to stakeholder interaction and science communication are included in Box 4.

Box 4. Other guides on stakeholder interaction Web based

- We strongly recommend www.fasttrackimpact.com/ and the accompanying *Research Impact Handbook* written by Professor Mark Reed. Here you can find lots of good advice and useful templates and listen to a podcast.
- www.biodiversa.org/702 is a stakeholder engagement handbook produced by BiodivERsA – a network of national and regional funding organisations promoting pan-European research on biodiversity and ecosystem services.
- *Books*
- Badget, M.V. Lee. 2015. *The Public Professor – How to Use Your Research to Change the World*. New York University Press, New York.
- Baron, Nancy 2010. *Escape from the Ivory Tower – A Guide to Making Your Science Matter*. Island Press, Washington DC.

2. Why is Research Often not Utilised?

2.1 The gap between research and policy-making

2.2 Policy-side constraints

2.3 Research-side constraints

2.4 Bridge the gap between research and policy-making – some solutions

Introduction

Generally and historically, science has had profound impacts on world development, strategic decisions and policy-making. However, multiple findings show that a great deal of the policy-relevant research is under-utilised or not utilised at all in policy planning or implementation. The reasons for this can be structured into three domains: policy-side constraints, research-side constraints and a general gap between research and policy-making. In the chapter below, we explain and explore these three domains.

2.1 The gap between research and policy-making

Research on the interlinkages between research and policy-making shows that there tends to be a gap between the domains². Their relationship is typically weak and they rarely meet and interact substantially. Of course there are exemptions, but generally actors in both spheres talk about a ‘flawed relationship’ that works sub-optimally from a societal development point of view. The actors in the policy sphere are in dire need of new useful knowledge for their planning and decision-making, and researchers host substantial amounts of research or evidence-based knowledge that does not come to use in the policy sphere.

The cause of this gap has been identified as a ‘lack of fit’ between the two categories. That is, researchers are (generally) driven by objectivity, logic, integrity, independence, neutrality, long time horizons and specificity (narrow focus). They are also driven by intra-academic incentives for career development and job promotion, which do not promote stakeholder engagement. In contrast, actors in the policy sphere are driven by ideology, subjectivity, voters, the objective of maintaining/attaining power and being re-elected. A policy-maker needs to bargain, reconcile various interest and take many different aspects into account such as cost-effectiveness and social acceptance. This is quite different from the features of research and researchers, as they do not need to (or are not able to) take those aspects into account when making recommendations.

2.2 Policy-side constraints

In addition to the general gap between research and policy-making, there are specific policy-side constraints. They include timing, the policy cycle and the difficulty of linking researchers to the policy formation continuum. As the saying goes, it takes two to tango, so of course this is not only caused by (semi-)closed or ‘difficult-to-enter’ policy processes. It is also the result of researchers not understanding political processes or lacking knowledge or authority to influence them.

A frequently recurring policy-side constraint is that decision-makers and planners often use research not to inform decisions but rather to back up decisions already made (e.g. Amara et al., 2004). This means that research that supports the views of decision-makers is more likely to be drawn on, whereas research that goes against current policy beliefs will more likely be disregarded. Further, it is not uncommon that decision-makers and planners show no or only little interest in what researchers want to convey. There are several reasons for this, among them lack of time, that the research is unconnected to any prioritised issues and that it does not fit with a decision-maker’s policy beliefs. Other policy-side constraints

² There is an extensive literature on this subject. See e.g. Weiss, 1977; Stocking, 1995; Scott, 1999; Glover 2000; Stone et al., 2001; Sarewitz, 2004; Owens, 2005; Pielke, 2007; Brownson and Jones, 2009; Oliver et al., 2014; van der Arend, 2014; and Lidskog and Sundqvist, 2015

include unwillingness or inflexibility among planners to modify policy planning and implementation in view of new research. Difficult and complex problems that require radical changes (and involve considerable political uncertainty) in order to be resolved are often ignored or given less priority. Similarly key research findings may be ignored if they are highly politicised and require costly investments or major changes of existing policies. Early studies of climate change and ozone-layer depletion are good examples (see further Harremoes et al., 2001).

Policy-side constraints also include the fact that actors in the policy sphere typically do not understand researchers; instead they prefer to listen to, and are more influenced by, other actors. Policy-makers have few incentives to listen to or link up with researchers. Instead they are principally driven by ideology and political will, and generally lack the necessary capacity to interact effectively with the research community. In addition, they have inadequate budgetary resources, infrastructure, channels and strategies for research uptake. Frequently among stakeholders (e.g. planners and politicians), there are perceptions of insufficient cost-effectiveness of research interaction (i.e. it is not worth the effort) and they would rather give their attention to their immediate constituencies, non-scientific advisors, voters and other more efficient channels of information. Additionally, there is unwillingness due to the innate risk among planners and decision-makers to have their policies, plans and programmes challenged by research evidence and the authority of senior researchers, which may discourage them from interacting. There are, of course, exceptions to this general picture.

Common perceptions among planners and policy-makers regarding the operational usefulness of research findings are that they are inconclusive, ambiguous and frequently contradicted by other research findings, too limited in scope, or out of date. Thus there is a lack of fit between what decision-makers need or want to know and what research can tell them. From the policy side, problematic factors associated with research evidence and communication are: concreteness, specificity and timeliness ('too late'). Policy-makers frequently claim that researchers fail to produce 'useable knowledge' and/or to articulate their findings in a language that policy-makers find accessible (Owens, 2005).

Although several constraints to an instrumental or direct use of research for policy making exist, there is often a considerable indirect influence from research on policy making. Over time, research can slowly percolate into the minds of policy-makers and contribute to a reframing of how problems and solutions are perceived. Rather than viewing research findings as prescriptions that should be followed in detail when formulating policy, research can have an "enlightenment function" (Weiss, 1977).

2.3 Research-side constraints

On the research side, there are also some noticeable and significant constraints to stakeholder engagement and influence³. Studies show that researchers typically lack sufficient incentives to engage in stakeholder interaction. Factors constraining stakeholder interaction include the formal criteria for successful academic career development and scientific esteem, which focus more on research work, journal publications and intra-academic relations, and to some extent teaching,

³ see eg Weiss, 1977; Stocking, 1995; Scott, 1999; Glover 2000; Stone, et al 2001; Sarewitz, 2004; Owens, 2005; Pielke, 2007; Brownson and Jones, 2009; Oliver et al 2014; van der Arend, 2014; Lidskog and Sundqvist, 2015.

than on stakeholder interaction. In addition, researchers, typically in the natural sciences, generally have insufficient knowledge about the policy sphere and how to engage with it productively. Usually they have few contacts with and points of entry into the policy sphere. Moreover, they often lack the necessary tools, strategies and communication skills. Institutional cultures of not engaging with policy also pose barriers. When asked about it, many researchers express a fear of ‘policy capture’ and ‘research misuse’. In such cases it is safer to stay out and avoid the risk of being ‘hijacked’ in uncertain policy processes. Also, the format in which research is presented is usually not conducive to integration into policy-making. For example, researchers often refrain from stating why research results are relevant from a societal perspective and exactly how decision-makers and planners should use a particular finding. This leads to a lack of ‘usable knowledge’ as described earlier. Moreover, researchers can also have unrealistic expectations regarding the potential influence of their research results or advice on a policy process, as change and influence usually take more time than expected or is not even picked up and acted on. Such perceptions or experiences may lead researchers to refrain from further engagement.

2.4. Bridging the gap between research and policy-making – some solutions

Generally, this guide aims at strengthening researchers’ capacity to engage with stakeholders in general, and planners and decision-makers in particular. Below, we list some general solutions and paths forward for softening especially the research-side constraints of the gap between research and policy-making. Arguably, one way to strengthen the interface between the research sphere and the policy sphere would be to ‘move science upstream’, i.e. to formulate research problems more in dialogue with stakeholders and involve them in data collection, research design and as discussants on preliminary (and final) research findings. Other measures would be to increase researchers’ understanding of policy processes (the dynamics of strategic planning, policy-making and implementation), address researchers’ dissemination challenges and ensure that more researchers possess adequate tools and strategies for policy engagement and hence make research more accessible for policy actors. By creating more effective partnerships between research and policy, researchers can enhance their understanding of the stakeholder sphere and may develop tools, strategies and approaches to intensify and improve their stakeholder interactions.

3. Two Models of Stakeholder Interaction

3.1 The transfer model

3.2 The interaction model

Introduction

There are several views and understandings among academics of what stakeholder interaction means and can be. Some view stakeholder interaction as something taking place primarily after the research is done, when it is time to communicate or *transfer* the findings of the research to stakeholders. Other researchers want to be more proactive and *interact* with stakeholders throughout the research process. In this guide we call these two views of stakeholder interaction the transfer model and the interaction model, respectively. A recent study show that researcher have different models for stakeholder interaction also within the same environment (Knaggård et al. 2019). We discuss these in 3.1 and 3.2 below. Irrespective of whether your point of departure is more in line with the *transfer model* or the *interaction model*, there may be several ways of improving stakeholder interaction linked to your research. Chapter 4 contains practical advice.

3.1 The transfer model

The transfer model builds on an understanding of science as a neutral activity that needs to be sheltered from political interests. Therefore, it is important that scientific research as far as possible is conducted without interference from stakeholders. Stakeholder interaction is here understood as something happening primarily after research has been done, when researchers communicate or transfer their results to stakeholders; see Figure 1. Within this model, ways to improve interaction are focused on enhancing communication skills, timing and knowledge about whom to contact.

Figure 1. *Transfer model*

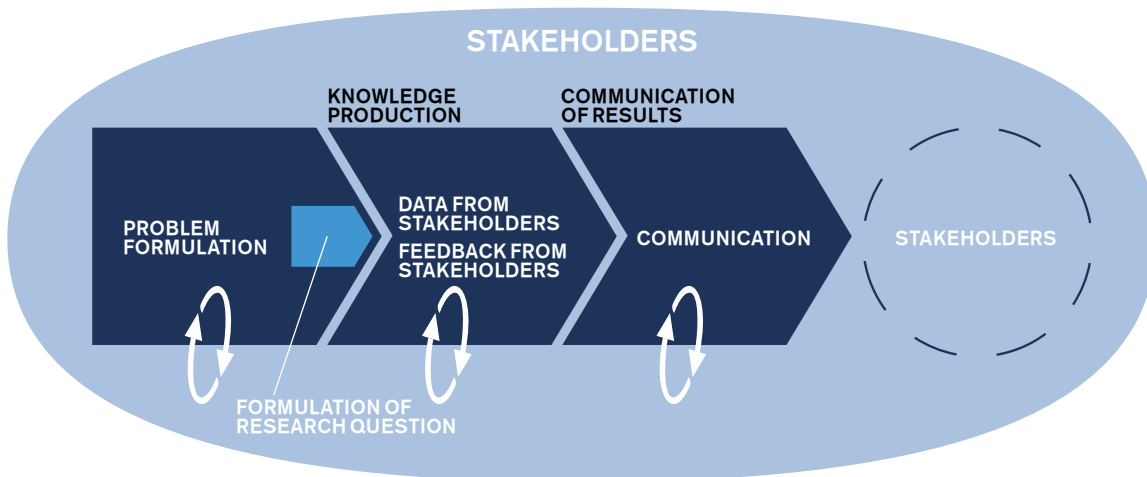


3.2 The interaction model

The interaction model builds on a very different understanding of the relation between science and society. Here, scientific research is not understood as an activity that can be separated from society. Instead it is seen as being connected to other actors and activities. The authority of science lies in its scientific and replicable methods, a systematic approach, rather than in being produced separate from society. With this model it becomes interesting to include stakeholders in different ways throughout the research process; see Figure 2. The reasons for this, is to gain broader access to data, get contextual information, communicating research findings and ultimately improve research. As the interaction between researchers

and stakeholders can improve the quality of knowledge, continuous stakeholder interaction is not seen as detrimental to good scientific quality. Thus, the focus on improving interaction is much broader than with the transfer model and covers issues such as how to engage with stakeholders in effective ways and the importance of building a network with stakeholders.

Figure 2. *The interaction model*





4. Roles and Strategies for Stakeholder Interaction

4.1 The researcher

4.2 The researcher group

4.3 The research institution

Introduction

This chapter reflects on the roles and strategies researchers may have in relation to stakeholder interaction over the course of a research career and within a research group. It also discusses what research institutions can do to create an environment conducive to effective stakeholder interaction and contains questions for researchers, research groups and research institutions that can assist in developing desired roles and effective strategies.

4.1 The researcher

When it comes to policy and stakeholder interaction, researchers can play several roles and pursue a range of different strategies. The choices made should be based on what they want to accomplish. What objectives do they want to attain? One determinant is the kind of research that a particular researcher pursues and the available opportunities to inform and influence in that particular research field. For example, the choices may depend on whether a researcher works with research questions close to policy-relevant issues or issues of more basic nature. The type and level of stakeholder interaction you have can change over time depending on the type of research questions you are dealing with, what type of interaction you or your colleagues have had in the past. You can actively search for new interactions. You can also decide to stop interacting.

A researcher of course has the option to play several roles and to choose among several different interaction strategies. Indeed, there are no right or wrong options; instead it is a matter of choice, individual preference and ‘research culture’ within the researcher’s group or institution. Attempting to structure the issue, Pielke (2007) suggests that researchers can assume one or (in combination) four different roles in stakeholder interaction: the pure scientist, the science arbiter, the honest broker and the issue advocate. As a *pure scientist* you focus on conducting research and getting published in peer-reviewed research publications. As a *science arbiter*, you answer specific questions, posed by planners, policy-makers or other stakeholders, within your field of expertise. As an *honest broker* (the role Pielke suggests researchers should strive for), you attempt to clarify and expand the choices available to planners and decision-makers; you integrate scientific knowledge with stakeholder concerns and place research within the context of a wide range of policy options. The *issue advocate* narrows down the range of possible decisions for decision-makers and planners by advancing specific choices.

If a researcher considers developing a strategy for policy and stakeholder interaction, he/she may want to assess and identify the *preferred* strategy for interaction. It can be for an entire research career or a shorter time horizon. Questions of interest include: What do you want to attain? How active would you like to be, now and in the future? What are the real possibilities to engage with stakeholders and policy-makers during your research career? As seen from practice, it is possible for a researcher to assume a certain role for stakeholder interaction at one point in the career and adjust it as experience is acquired and stakeholder networks are built. For example, it might be easier and more natural for a junior than a senior researcher to be more of a pure scientist and focus on building research experience. Yet this is not cast in stone; even a junior researcher may be very active in engaging with stakeholders.

For most researchers, it is useful to occasionally take a step back and reflect on what kind of stakeholder interaction he/she wants to pursue. The questions in Box 5 can be used when reflecting on these issues.

Box 5. Reflective questions on roles and strategies for stakeholder interaction for the individual researcher

- What kind of researcher would you like to be?
- What motivates you?
- Is stakeholder and policy interaction important to you? Why?
- What do you want to attain?
- What are the possibilities to engage with stakeholders at present and later in your research career?
- How active would you like to be, now and in the future regarding interaction?
- How do you get from where you are today to where you want to be later in your career?
- What could be some tangible next steps?

Hard work, good timing and personal skills and interests make many young researchers highly demanded in the policy sphere. As you grow more mature as a researcher usually you also develop your stakeholder interaction skills and stakeholder networks. Maybe you are called upon to answer specific questions within your field of expertise or to present findings at policy seminars, or perhaps you get involved in public investigations, scientific panels, advisory committees etc. As full or senior professor, it is more common to get involved in research donor committees or to be asked to provide advice on general public policy formulation issues within your field of research and expertise. However, there is nothing pre-determined or automatic in this development, but the more you interact, the more you are bound to learn. Interaction also makes you more visible to decision-makers and planners. Mostly the choice of trying to interact with stakeholders is yours as well as it is influenced by your research field, group or institution, but usually the expectations, invitations and opportunities to reach out increase as you become a more senior researcher.

In addition to the benefit of utilising research in planning, decision-making and society in general, policy engagement and stakeholder interaction can benefit the researchers. For example, they may benefit from access to more or other material and data to analyse, help in putting research issues in a broader and societally relevant context, generate new research ideas and more/new potential funding sources (see Box 6).

Box 6. Opportunities with stakeholder interaction

- Building and expanding networks with stakeholders
- Access to data and research materials
- New research ideas
- Presenting findings at policy and stakeholder workshops/seminars
- Invitations to advisory boards and government commissions

- Membership in research funding and/or research-policy committees
- Inquiries for independent research advice and ‘second opinions’
- Invitations to media events, debates and public hearings

However, there may also be a risk that the interaction with stakeholders can negatively impact research. One well-known example is research on cigarette smoking where the tobacco industry managed to delay the translation of research findings into public health policies (Oreskes and Conway, 2010). The way to deal with this risk differs between the transfer model and the interaction model. With the transfer model, the solution is to avoid contact with stakeholders during the research process to minimise the risk of capture and undue influence. With the interaction model, strategies used by researchers to handle this risk include declining project funding from sources that are seen as having hidden agendas, formulating research questions without external influence (but be open to influence on the broader research problem) and being very specific in communications with stakeholders whether one is speaking as a researcher or in some other role.

If poorly performed, stakeholder interaction can also risk to lower the quality of the research outcomes. For example, using experts’ judgments as “data” in research requires a structured approach and careful attention to cognitive biases and heuristics (O’Hagan et al, 2006). It takes time to learn how to conduct stakeholder interaction in a good way. For some researchers, it requires gaining new knowledge and an understanding of the scientific methodology in a different research discipline. It can for example be a chemist who starts to work with participatory processes for solving a particular environmental management problem. Stakeholder interaction may then require theories or methods from the social or cognitive sciences. A way forward can be to engage and collaborate with scientists in those disciplines.

4.2 The research group

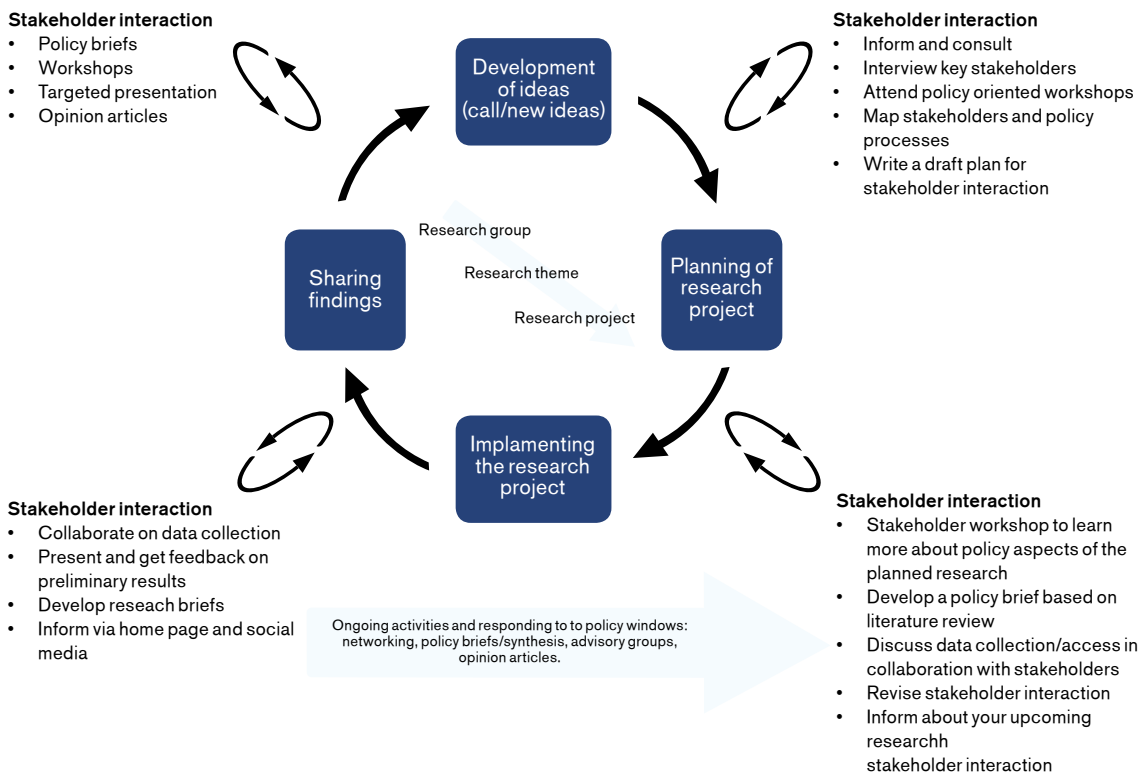
Besides engaging in stakeholder interaction at the level of the individual researcher, research teams often develop specific stakeholder interaction strategies for each of the different research projects they are involved in. To have a joint strategy within a research group can be beneficial both in terms of mutual learning and synergistic effects. The cumulative efforts, or collective findings, may be more interesting or relevant from a policy perspective than the outcome from a single study.

Many of the questions for the individual researcher in Box 5 also apply to the research group: As regards stakeholder interaction, what policy or stakeholder interaction objective does your research group want to attain? What role does your group want to play? Is there a strategy, and if so, what is it and what are the tactics to achieve it? Who does what? How is the group organised? Fundamental objectives for stakeholder interaction at the group level may be to: inform and influence strategic planning; contribute to policy formulation and decision-making; share research knowledge; enhance opportunities to attract research funding; and improve the quality of the research.

Given the group's objective(s), one may discuss and identify specific activities and actions that can be done. One group-level objective is to *create a culture* of stakeholder interaction. Through team work and (more or less explicit) division of labour, the group may develop its collective skills, strategy and tactics to engage with stakeholders. Within such a group, senior researchers with more experience can support junior colleagues who wish to develop networks and skills. A research group can also develop a supportive infrastructure for stakeholder interaction, for example by creating a joint website, a communication and social media strategy and newsletter, as well as shared on-the-job training opportunities (e.g. specialised short courses) and if possible employment/capacity development of communication staff.

It is often useful for a research group to develop a strategy for stakeholder interaction not only for specific research projects but also for broader research programmes. Figure 3 illustrates that at each stage of the research project cycle, there are a number of stakeholder interaction activities that can be undertaken. In addition to the life cycle of a specific research project or programmes, Figure 3 also highlights that there are activities that should be undertaken continuously. Examples include networking activities of individual research group members, participation in advisory groups, publication of opinion articles and responding to policy windows when they occur. These activities are not necessarily linked to the specific research project cycle.

Figure 3. Stakeholder interaction across research projects, research themes and research groups



Box 7 contains questions that can help research groups reflect on roles and strategies relating to stakeholder interaction. The research group should ensure an open discussion with active participation by all members around these questions. The outcomes will be very different depending on whether researchers see stakeholder engagement as an opportunity for knowledge exchange or as time away from research.

Box 7. Questions for a research group on roles and strategies relating to policy and stakeholder interaction

- What does our research group (and the individual researchers) hope to achieve with our research?
- How can better understanding of stakeholder needs, knowledge and involvement contribute to these aims?
- What are our objectives relating to stakeholder interaction?
- What strategies do we use to reach these objectives?
- What roles do we as individual members of the research group have? Is the division of labour adequate?
- What can we do to develop our capacity for and skills in effective stakeholder interaction?
- How do we monitor and evaluate the results of our interaction activities?

4.3. The research institution

The roles and strategies discussed in the previous chapters are also relevant for the entire research institution. However, non-permissive research institutions may, implicitly or explicitly, discourage stakeholder interaction. At this level the general question is whether, and to what extent, the research institution provides an *enabling environment* for stakeholder interaction. This may include incentives and opportunities for career advancement in relation to whether an individual or a group is active/inactive in stakeholder interaction. In an enabling environment, active stakeholder interaction should be promoted. Proactive research institutions may use positive *incentives* (salary, positions, promotions, awards etc.) to encourage stakeholder interaction. Support structures encompassing communication staff and specialists on stakeholder interaction can also be established.

To be able to build an enabling environment and effective support structures, it is important that research institutions are clear about what they mean when talking about stakeholder interaction, and that it should be encouraged. Stakeholder interaction models and roles researchers can play vary across individual researchers and research groups. This needs to be taken into consideration so that a research institution can enable and support different kinds of stakeholder interaction.

Research institutions may carry out reviews of current practices and formal procedures for promoting/discouraging stakeholder interaction, (formal and informal) opportunities available for career advancement in relation to stakeholder interaction, and incentives for stakeholder interaction. Based on the results, necessary reforms – such as on-the-job trainings, targeted initiatives, new recruitments or capacity development of stakeholder interaction resource persons and communication staff – may be identified and implemented. At present, many research

institutions are not optimally designed or managed to promote stakeholder interaction. Box 8 lists questions that can help research institutions reflect on objectives, strategies and incentives relating to stakeholder interaction.

Box 8. Questions on stakeholder interaction for a research institution

- What do we as a research institution mean by stakeholder interaction?
- What are our objective(s) related to stakeholder interaction?
- What strategies do we use, or need to use, to reach these objectives?
- What incentives/disincentives exist for stakeholder interaction?
 - Career advancement?
 - Funding?
 - Training opportunities?
 - Recruitment policies and plans?
 - Ways of recognising successful stakeholder interaction?
- What support functions for effective stakeholder engagement are in place?
- What can be done to develop an environment conducive to effective stakeholder interaction?
- How can we monitor and evaluate the research institution's strategy and achievements related to stakeholder interaction?



5. Tools for Stakeholder Interaction and Communication

5.1 Stakeholder interaction when defining research problems and questions

5.2 Stakeholder interaction when conducting research

5.3 Stakeholder interaction when final research results are available

5.4 Stakeholder communication throughout the research process

Introduction

There are many ways to communicate and interact with stakeholders during the three different research phases, i.e. problem formulation, knowledge production and communication of results. Some of them are only used in a certain phase, e.g. targeted presentations of the results in the final phase, whereas face-to-face meetings and social media can be used throughout the research cycle. There is plenty of guidance on communication and interaction with stakeholders available online, including practical advice on how to organise stakeholder workshops, set up advisory groups and communicate research results. This chapter provides some examples of useful tools and points the reader to sources of further information.

5.1. Stakeholder interaction when defining research problems and questions

Stakeholder interaction in the *early stage* of a research process can benefit both you as a researcher and the stakeholders. First, it can give you a better understanding of the practical context of your research and the issues facing those who work in that context. Second, stakeholders can become interested in your planned research project and therefore more willing to interact during the process. Third, cooperation with stakeholders at this early stage can strengthen the application of your research.

Examples of activities you can undertake include:

- Interview key stakeholders about their perspectives on your research problem and questions
- Attend policy-oriented conferences to get input and discuss your upcoming research project
- Write a policy-oriented briefing note based on your literature review
- Invite a range of stakeholders to present and discuss issues related to your research area
- Inform about your upcoming research project via social media and ask for input

Keep in mind that there are a number of activities that can be undertaken continuously. Examples include networking activities by individual members of a research group, participation in advisory groups, publication of opinion articles and responding to policy windows when they occur. These activities are not necessarily linked to the specific research project cycle. While funders may require media strategies for specific projects it may be useful to the research group to think of one for the research theme.

Box 9. Further guidance on stakeholder interaction early in the research process

To learn more, you can find ‘how-to guides’ in the [University of Edinburgh’s](#) knowledge exchange resources. Practical tips on how to create a social media strategy for your research can be found at [Fast Track Impact](#).

5.2. Stakeholder interaction when conducting research

Interacting with stakeholders *during* the research process provides a multitude of opportunities for accessing relevant data, getting feedback on your work and raising awareness of your research among relevant actors. Face-to-face meetings, networking and in some cases even a social media strategy can create opportunities for reaching out to multiple stakeholders and generating broad interest in your research project. By presenting what you are doing and your preliminary findings, you give other actors an opportunity to raise questions and give feedback. It can also be important for you to interact with your stakeholders at this stage in order to gain access to more data.

Examples of activities you can undertake include:

- Collaborate with public organisations or other stakeholders to gain access to data
- Involve citizens in collection of data
- Involve stakeholders in a systematic comparison of different alternatives through multi-criteria decision analysis
- Present preliminary results and get feedback on them from key stakeholders
- Create interest in the project through social media, as appropriate

In box 10 we list some of the many good existing guidance on how to interact with stakeholders during the research process.

Box 10. Further guidance on stakeholder interaction during the research process

For examples of how to involve citizens in data collection, see e.g. the [North American Breeding Bird Survey](#) or <https://www.zooniverse.org/>. See the [Mistra Urban Futures' manual for joint knowledge production](#) for advice on long-term collaboration with stakeholders.

For advice on how to write a research brief during the research project, see the following memo from the University of Edinburgh: http://www.edinburgh.ac.uk/files/atoms/files/how_to_write_a_research_briefing_oct2016.pdf

See the Biodiversa stakeholder engagement handbook on [how to organise a stakeholder workshop](#) and [how to conduct multi-criteria decision analysis](#).

A recent guidance to uncertainty analysis is currently being developed by the European Food Safety Agency (EFSA). A link to a draft of this comprehensive and state-of-the-art uncertainty guidance is available online at <https://www.efsa.europa.eu/en/topics/topic/uncertainty-assessment>.

A guidance to a scientific approach to multi criteria decision making and introduction to methods for hands-on stakeholder interaction for a structured decision making process is available at <http://www.structureddecisionmaking.org/> and in the seminal book by Gregory et al. 2012.

Using expert's judgments as "data" in research requires careful attention to

cognitive biases and heuristics and methods to elicit expert's knowledge. A structured approach for expert knowledge elicitation with introduction to the science behind it is provided in the book *Uncertain Judgements: Eliciting Expert Probabilities* by O'Hagan et al 2006 and software for expert elicitation such as The MATCH Uncertainty Elicitation Tool can be used for free and is available at <http://www.match.ac.uk/uncertainty/>.

5.3. Stakeholder interaction when final research results are available

At this stage, the research process has come to an end and you have results and conclusions to present. Interacting with stakeholders hopefully seems like a natural thing to do at this point. Now you have the possibility to reap the benefits from your previous interactions with stakeholders and hopefully they are eager to know the results of your research.

Examples of activities you can undertake include:

- Present your research results at academic and non-academic conferences and workshops
- Write policy briefs and research briefs
- Write opinion articles
- Make a short video in which you present your results
- Make presentations targeted to key stakeholders

See box 11 for further guidance on stakeholder communication.

5.4. Stakeholder communication throughout the research process

There are a few key capabilities for good communication that researchers typically could improve. The first is the ability to summarize the essence of the research, the second is the ability to use a language which is understandable and the third is the ability to understand the target audience, their context and their perspectives. Combined, these skills can improve the research process, the quality of the findings and the uptake of research. Also, do not forget to explore the research communication knowledge that already exists within your organisation. Is there a communication and press unit that can help you with effective communication?

Summarizing the essence of your research

Researchers know their topic well and are used to present their work in a logical flow. But this is not always the way communication happens, that you have time to go from A to B and to C. [Tool 1: Explaining the essence of your research -The Message Box](#), is a useful approach that prepares researchers to explain their work regardless of the angle from which the conversation starts. It is equally useful for communication with policy makers, farmer cooperatives, journalists or local governments.

Using understandable language

The use of technical jargon is efficient when researchers within a defined area of a defined discipline communicate with each other. However the use of jargon in any other circumstance creates a barrier between the researcher and their stakeholders. Knowledge exchange stops, messages are not understood. It takes dedicated effort to avoid technical jargon and to speak about research in an understandable

language. There are several useful websites that can help researchers to improve readability and avoid jargon. In addition there is also the oldest and probably best way of testing if your messages get across; talk to a friend from outside of your research discipline and ask him or her to repeat your core messages.

Understanding your audience

Researchers using the transfer or interaction model both benefit from careful attention to the target group they are communicating with. A reasonable understanding of their context, needs and interests creates greater opportunities for dialogue and knowledge exchange or simply in getting your key messages across. The extent to which you should adapt what and how you communicate with different target groups must be assessed on a case by case basis. The credibility of you as a researcher is your greatest asset and cannot be compromised.

Box 11. Further guidance on stakeholder communication

[The Message Box](#) is a very useful tool for helping researchers to summarize the essence of their research and prepare them to respond to questions from different angles. For help in using understandable language the following web sources are among the most useful: The [Up-goer six text editor](#) (colours words depending on how common they are), the [Plain English Campaign](#) (A to Z of alternative words) and [Gunning Fog Index](#) (counts the length of sentences and number of words with three or more syllables and determines a score for readability).

See also [Fast Track Impact's guide to write a policy brief for impact](#) and the [Science Communication Toolbox](#), which gives hands-on advice on how to present research in an engaging way.



6. Planning for Stakeholder Interaction?

6.1 Identify and analyse your stakeholders

6.2 Make a plan for stakeholder interaction and communication

6.3 Follow-up of stakeholder interaction activities

Introduction

Whether you use the transfer or the interaction model, good planning is key to ensuring that the interaction becomes more than an ad hoc activity with little connection to your overall aim. Being strategic and setting priorities are crucial in order to increase the value of the time and resources invested in this area. This type of planning should begin with identification of the aims that the researchers want to achieve with stakeholder interaction, as described in chapters 4.1 (individual researchers) and 4.2 (research groups).

The *interaction model* involves interaction with stakeholders in all three stages of the research cycle, i.e. problem formulation, knowledge generation and communication of results. If properly managed, it provides many opportunities to build trust and understanding between researchers and stakeholders, which can increase the likelihood of having both a more direct and a more sustainable influence on policy and/or practice.

The *transfer model* focuses on knowledge exchange activities and communication of results in the final stage of the research cycle. At its extreme, the researcher only communicates the research findings in various channels such as policy briefs, social media and presentations. More often, however, researchers also engage in knowledge exchange where different stakeholders can discuss the implications of findings for future research projects and actions. Getting the most leverage from these activities requires a good understanding of stakeholders' needs, priorities and preferred ways of interacting with researchers.

6.1. Identify and analyse your stakeholders

Having a good understanding of stakeholders' needs, priorities and knowledge brings many benefits to the research project. It is useful to think of the role of stakeholders in two different ways: as those who may influence the quality of the research per se and as those who have an interest in the findings. Stakeholders can contribute to strengthening the quality of your research in several ways, for example by providing access to data and by enhancing your understanding of the practical context of your research focus. A variety of public, private and civil society stakeholders may have an interest in your findings.

To assist in the identification and analysis of stakeholders linked to your research project, you may use [Tool 2: Who are your stakeholders?](#) in the Appendix. This tool helps you map national and international stakeholders from the public and private sectors, civil society and academia. It provides a simple structure for identifying who to engage with. Try to be as specific as possible. If the stakeholder is an organisation, you may want to specify a specific department or unit. If you have specific contacts within the organisation, you can even specify individual names.

It is often useful to map stakeholders in graphical form. [Tool 3: Graphical mapping of stakeholders](#) provides an example of how this can be done. With this tool, you can also map policy initiatives linked to your specific area of research. Policy initiatives can for example refer to plans for new legislation, major investment plans, tax proposals or upcoming negotiations on international climate agreements.

You may want to begin your stakeholder mapping by brainstorming together with colleagues in your research group. However, it is strongly recommended to complement this type of brainstorming with dialogues with people outside academia, especially people whose job it is to have a good view of the context in which your stakeholders are located. They may be found in government agencies, political parties, business associations, non-governmental organisations or the media sector.

In order to prioritise among potential stakeholders that you would like to influence, you should first analyse their current knowledge, interests and authority. Box 12 contains some guiding questions for the stakeholder analysis.

Box 12. Questions to guide the stakeholder analysis for a research project

- What is the stakeholder's level of knowledge of your research area/project?
- What in the research project may be new, interesting or important to the stakeholder?
- Will the research project affect the stakeholder negatively or positively in any way?
- Is there a risk that the stakeholder will negatively impact your research project? What could be the implications of such interference and what measures can be taken to reduce such risks?
- Can interaction with the stakeholder benefit your research project, e.g. by facilitating access to data?
- Does the stakeholder have the authority to delay or promote policy change suggested by your research?
- What type of interaction with the stakeholder would be possible and preferable?
- What contacts do you have with the stakeholder today? What would be a good way to enhance the contacts?
- Should any policy windows be considered, e.g. development of new legislation or proposals that may increase the demand for research input?

Based on your answers to the questions in Box 12, you can graphically map the stakeholders according to their anticipated interest in your research and their influence on policy processes linked to your research area. [Tool 4: Analysing the authority and interest of stakeholders](#) provides a simple matrix for this work. This categorisation of stakeholders can help you prioritise and define what type of collaboration you should aim for with different stakeholder groups. For example, stakeholders with both strong influence and strong interest in your research should normally be given high priority and would likely be willing to participate in workshops or receive continuous information about the research project. Stakeholders with strong influence but weak– or perhaps negative – interest in your research should also be given due attention. When and how should they be informed or involved?

You may also consider whether multiple interests are represented in an organisation that you have identified as a stakeholder. For example, one unit within the Ministry of Agriculture may be responsible for conservation agriculture whereas

other parts of the same ministry promote other technologies. In such instances, it may be relevant to map them as separate stakeholders.

Box 13. Further guidance on stakeholder analysis

For more guidance on stakeholder mapping, you may visit the section dedicated to this at the [Research to Action website](#), or specific chapters of the BiodivERsa [stakeholder engagement handbook](#). See also [Fast Track Impact guidance](#) on the topic.

6.2. Make a plan for stakeholder interaction and communication

Based on your motivations, the specifics of the research project and the initial mapping and analysis of stakeholders and their interests, you will need to decide how and when to interact with your prioritised stakeholders. You may use [Tool 5: A plan for stakeholder interaction](#) to document your plan. Make sure that sufficient resources, time and money are allocated to activities such as meetings with stakeholders, events/workshops, webpage development, social media contributions, travel and attendance at non-scientific conferences and production of briefs and other targeted material. Also consider how the action plan can incorporate and build on the individual strengths and interests of the members of your research group. Last but not least, be aware of the importance of coordinating your interaction with key policy windows.

6.3. Follow-up of stakeholder interaction activities

Research funding increasingly requires monitoring of impacts. However, impacts are not easily tracked and it is rare that one research programme or project alone directly impacts a specific policy and/or practice (see Chapter 7 for more information on this). More commonly, research has a slow and indirect influence on policy through an enlightenment function (see e.g. Weiss, 1977). Examples of such an influence include changes in how problems are perceived or framed and broadening of policy options available to policy-makers (Carden, 2009). Despite the obvious difficulties involved, the chances to track the impacts of your research increase if your plan for stakeholder interaction is accompanied with a monitoring and evaluation scheme. Such a scheme basically consists of a set of indicators and, importantly, a way to gather the necessary information. Besides activity and output indicators, it is important to also capture outcomes of stakeholder interaction activities. Quantitative output and outcome indicators may include numbers of website visits and citations in popular media or in documents generated by stakeholders.

Qualitative information generated through interviews, focus groups or surveys with stakeholders is often an important complement and critical to understanding the impact of your research and knowledge exchange activities. This information may concern how new knowledge has been applied or referred to in discussions at local or national level (Durham, 2014; Reed, 2016).

You may use [Tool 6: Monitoring matrix for stakeholder interaction activities](#) to plan the monitoring of your stakeholder interaction activities. It includes examples of indicators at the output and outcome levels.

7. Evaluating Societal Impacts of Research⁴

7.1 Framework to assess research impact

7.2 Methods to assess research impact

7.3 Experiences from national evaluation systems

7.4 Conclusions

⁴ This chapter builds to a large extent on a text written by Julia Runeson, intern at Gothenburg Center for sustainability, GMV at University of Gothenburg and Chalmers University of technology during Sept-Oct 2018

Introduction

In 2015 world leaders adopted the agenda 2030 and the 17 sustainable development goals, a blueprint on how to achieve a sustainable future for all. These goals address great societal challenges such as poverty, environmental degradation, inequality and climate change. Academia plays a crucial role in achieving these goals since they call for scientifically grounded solutions and innovations that are not yet in place. This line of reasoning is reflected in current research politics as well. It calls for universities to be more interactive with society at large. Universities should not solely develop new knowledge but be an active agent for societal change (Bornmann, 2013; Wiek, 2014).

Moreover, the Swedish government bill on research and higher education holds that “engagement and societal impact shall increase” (Govt. bill 2016/17:50, our translation). EU’s framework program for research funding Horizon 2020 presents a similar perspective. The framework has a challenge-based approach where research funding will focus on seven societal challenges such as climate action; smart, green transport or; health and wellbeing (European Commission, 2018). This new perception of research in society has led to increased demand on monitoring the societal effects of research. Researchers are asked by universities, research funders and in some cases governmental agencies to report and evaluate the societal impact of conducted research (Bornmann 2013; Wiek, 2014 Reed et al, 2018).

Yet, the relation between science and societal impact is complex. First, the effects of research vary widely and range from small effects such as discussions on social media to large effects such as implementations of policies and changed norms. Second, societal outcomes occur due to a complex web of events which makes it difficult to trace a societal impact to a specific research project (Cvitanovic et al. 2018; Hanson and Polk, 2017; de Joung et al, 2011; Swedish research council, 2018). Further, the traditional research evaluation system based on bibliometric indicators does not include the societal impact of research (Bornmann and Haunschild 2017; Rasmusen and Andersen, 2013). Researchers, then, are asked to report the societal impact of research but might not sufficient experiences on how to do it.

This chapter aims at increasing our understanding of research impact assessment in daily scientific work by presenting a framework on how researchers and research groups can understand and evaluate the societal impact of their research. Research impact is a vast research field of its own. Furthermore, evaluating societal impact of research may also be a normative action. However, this discussion is not elaborated in this guide.

7.1 Framework to assess research impact

The effects of research vary in depth and complexity. Research can be discussed in social media, it can be cited in implemented policies or contribute to real physical changes e.g reducing emissions from energy production. All these effects may be generated by research but their effect on society varies greatly. These different types of effects are rarely distinguished from each other. Even studies that aim to understand what facilitates research impact have a vague definition of the term and more commonly discuss presumed indicators of research impact (Cvitanovic

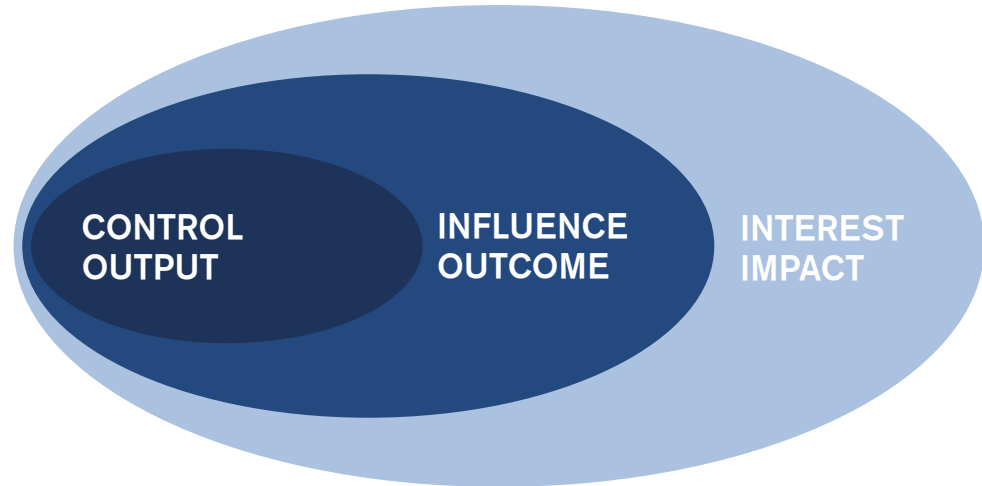
et al. 2018; Reeds et al. 2018, Jones, 2011). Still, some attempts have been made to create a framework that distinguishes the societal effect of research from each other.

Wiek et al (2014) categorizes research impact into *first order and second order effects*. The first order effects refer to the immediate effects of a research project that occur during the project process such as enhanced capacity, useable products, new networks or publications. The second order effects refer to impacts that take longer time to happen and occur (sometimes very long) after the project has ended. Examples include e.g implemented policies, changes in norms, behaviour and values, changes in organizations, institutions or other structural changes (ibid). While these categories do describe research impact, they are quite broad. None of the categories distinguishes between the effects that a researcher can influence and not. First order and second order effects depend to a large degree on factors that a research group cannot control.

Another, well establish evaluation framework is the payback framework which categorizes the effects of a project into outputs, outcomes and impact. These categories help researchers describe the process from research outputs to societal impact. The outputs are the immediate effects of the project and the outcomes are the actions that follow from the outputs. Impact refers to the societal effects or structural changes (Swedish Research Council, 2017). The Swedish research council argues that this view of research impact can be misleading since research impact is typically not generated through a linear process (Swedish Research Council, 2018). Walter et al (2007) even argue that impacts, such as behavioural changes of stakeholders, are the intermediate effects facilitating outcomes from outputs. Furthermore, societal impacts, such as changes in norms, can rarely be traced back to one actor or one research project (Swedish Research Council, 2018). Hence, the payback framework interpreted literally or in a mechanistic fashion arguably provides an overly simplistic picture and framework for identifying societal impact of research.

The International Development Research Centre (IDRC) in Canada presents a framework that structures the effects of research based on what the researchers can control and influence, rather than a linear process from output to impact as described above. Here, the researcher can control some outputs of the research project such as results, availability or policy proposals. The outcomes or the use of the research lies beyond the researchers' control, yet in their sphere of influence. The researchers cannot implement policies as such, but they can influence politicians by being available, take part in policy discussions and provide relevant research knowledge in policy planning processes. Finally, it can be in the researcher's interest that the research contributes to certain societal objectives or impacts such as poverty reduction, sustainable resource management etc. (Ofir & Schwandt, 2012). The different spheres of control, influence and interest are presented in figure 4.

Figure 4. *Sphere of Control, Influence and Interest in Output-Outcome-Impact Framework*



Source: Adapted from Ofir & Schwandt, 2012 p.10

While all frameworks might be useful when assessing research impact, this final framework is arguably the most suitable one to help researchers or research groups understand and evaluate the effects of their own research. This model acknowledges that research impact is not a linear process, that there are levels or layers to relate to (what is in my sphere of control? What can I influence and what is outside my control?), and that researchers rarely are in a position to generate societal impacts on their own.

7.2 Methods to assess research impact

This section discusses how researchers or research groups can assess the output and outcomes of a research project based on the framework presented above. As noted earlier, research groups may have an interest in contributing to societal change. Still, planning ex-ante or evaluating ex-post the societal impacts of research is a complex process and difficult task (Cvitanovic et al. 2018, de Jong et al 2011; Hanson & Polk, 2017). Research groups have a limited amount of time and resources to spend on assessing research impact. This makes it reasonable to focus on the effects that a research group can control or influence i.e. outputs and some immediate outcomes. While it is important to know and report what societal challenges a research project aims to contribute to, it is outside the scope of this guide to discuss methods to evaluate this final step of societal impact.

While many methods exist, there is no single evaluation method or approach that is best suited to evaluate research impact. All have different pros and cons. Generally, though, planning for evaluation at an early stage of the research process makes the evaluation easier and more useful. An established plan for evaluation makes it possible to collect relevant data throughout the research process, such as interviews, surveys or logs of publications. Furthermore, it makes it possible to assess whether the project is heading in the intended direction (Reeds, 2018; Reeds et al 2018).

Outputs

It is not possible to evaluate research impact by a set of standardized indicators, as discussed above. Still, a description of a research impact, such as a case study, must include sources that corroborate the impact. The outputs of a research project are the immediate contributions such as research results and publications, but also attempts to spread knowledge such as policy proposals, co-produced publications or work on advisory boards. The simplest way to evaluate the outputs are to register the type and quantity of different actions. While this might not say much about the quality of the output it is necessary and useful to report what has been done. Mark Reed (2018) highlights the importance of an easily accessible system, where members of a research group can register events and actions as they occur. This facilitates a comprehensive collection of outputs, and that nothing is forgotten when it is time to report or evaluate. There are many platforms that research groups can use to jointly register outputs such as Evernote, OneDrive or joint mailing-lists (ibid).

There is no guarantee that outputs lead to certain outcomes. Still it can be useful to review the outcomes of a research project in relation to certain outputs and their intended outcomes or impacts. The research programme Mistra Urban Futures (<https://www.mistraurbanfutures.org>) provides an example of this. Researchers at the organisation wrote a book on sustainable urban planning. They thought that practitioners in the field, among others, could find it useful. When the book was published it was only read by a few practitioners. The authors revisited and revised their output twice, first by reducing the content to a shorter report - but there were still only a few practitioners that read it. Finally, they produced a short document presenting the key findings of the book and now the practitioners showed interest. The document had to be reprinted and was even translated into another language (personal communication, Jan Riise, 2018-09-19).

Even well communicated and relevant research might not achieve the intended outcome due to factors beyond the control of the research group (as will be discussed in the next section) (Hanson and Polk, 2018). Evaluating outputs, then, is about reporting the research group's attempts to be accessible to stakeholders outside academia.

Outcomes

As for evaluating research impact in general, there is no single method that is best suited to evaluate research outcomes. The methods available range from simply logging how many tweets a publication got to qualitative studies of impact(s) carried out by external reviewers. A research group can focus on assessing only the intended outcome of a research project, or more broadly all of the unexpected outcomes. The scope of the assessment is determined by the time and means available in the research project.

Guides on research impact evaluation typically advice researchers to start by defining what type of impact they wish to evaluate and then trace what contribution the research project has made to this impact. This way it is possible to choose a suitable method depending on what impact you wish to assess (Reeds, 2018). Still, research has often unexpected outcomes as well and these will not be reported or discovered with such method. Research often includes other actors than the research groups.

This means that the research group cannot control the outcomes of a research project. Even well communicated and relevant research projects might fail to achieve the intended outcome due to factors they do not control (Hanson and Polk, 2018). For example, lack of scientific knowledge might not be the reason a specific policy is not implemented (Knaggård, 2014). Decision makers might cancel the implementation of a policy due to shifts in public opinion; a company might not launch a new product due to uncertainty on the market. Still, the research project might have had other unintended outcomes such as extended networks or learning new working methods. These are important to review and identify as well. Qualitative methods, such as interviews or focus groups, are useful when assessing these unexpected outcomes (Cvitanovic et al, 2018, King's College London and Digital Science 2015; Hanson and Polk, 2017; Swedish Research Council, 2017).

In-depth analysis of research outcomes has many advantages but there is not always enough time or means to do it. The simplest way to assess research use is to understand who and how many are using it, and how. Altmetric evaluation systems help researchers with such an assessment. These systems are based on traditional bibliometric systems, but they include other types of publications such as grey literature, media, social media, blogs, number of downloads as well as academic publications (Bornmann and Haunschild 2017; Rasmusen and Andersen 2013). Altmetrics give a hint of how the research is used in society and can help researchers discover new unexpected stakeholders that show interest in their research. Box 14 presents two altmetric tools available free of charge online.

Box 14. Altmetrics tools

Altmetric.com is an online tool that helps researchers keep track of the online activity of certain research contents. Altmetric logs where the research content is cited or discussed by collecting data from public policy documents, mainstream media, social media, blogs, multimedia platforms and online reference managers. This provides a picture of both bibliometrics and altmetrics in one overview. The tool also shows, to some extent, where in the world and what actors interact with the research content. This helps researchers discover new, perhaps unexpected stakeholders. Parts of the altmetric toolbox is available for free and can be downloaded to your browser.

Impactstory.org provides an online tool that tracks where and how often research content is cited, discussed or downloaded. Impactstory collects data from social media such as twitter and Facebook, but also from news outlets, blogs and ORCDI. The results are presented at the user page and provide an overview of the online activity. Impactstory is free of charge.

Even relevant, available, well communicated research might not have any significant outcomes due to factors beyond the control of the research group (Hanson and Polk, 2018). Researchers may have capacities to advice but not sufficient skills or incentives to influence. Still, is it reasonable to evaluate the quality of research based on outcomes when they are outside the researchers' sphere of control? The overarching aim of research evaluation is to assess and learn about researcher's interaction with, and influence on, (actors in and processes in) society. While evaluating the effects of research they might become more aware of and intere-

sted in such interactions. This is the experience of the British national evaluation system of research impact, which will be discussed in the following section (Kings College of London and Digital Science, 2015; Swedish Research Council, 2017)

7.3 Experiences from national evaluation systems

Assessing the societal impact of research is an international trend. Initiatives have been taken by a range of actors such as national agencies, universities, research funders and research projects (Bornmann, 2013). The Netherlands and the UK are often mentioned as forerunners regarding evaluation of the societal impacts of research (Bornmann, 2013; Swedish Research Council, 2017). The two countries have developed different systems and approaches, yet they have some similarities. Both systems aim to facilitate and increase collaboration between researchers and stakeholders outside academia. Researchers are asked to conduct case studies that reflect and assess the societal impact of their research themselves. These case studies are then evaluated and graded by expert panels. There is a risk that self-evaluations are biased, yet the overarching aim of these systems is to increase researchers' interaction with society and make researchers reflect on the societal impact of their research. Evaluations of the British system hold that the evaluation system has managed to generate just that (Swedish Research Council, 2017).

A distinctive feature of the British system is that the outcome of the assessment informs allocation of research funding. The reporting system is hence strict and clearly defined. Each university is responsible for reporting the societal impact of the research conducted at the faculties by assessing case studies. The number of required case studies are determined by number of full time employees. The cases studies are approximately four pages long and include a summary of the impact, a description of the underpinning research, references to the research, details of the impact, and sources to corroborate the impact. The reported impact should have occurred during the latest five years and the research activities leading up to the impact should have been carried out during the last 20 years (Swedish Research Council, 2017). All case studies are available online and could be reviewed before assessing a research project for inspiration⁵.

The evaluation system in the Netherlands does not have any economic implications. Evaluations of the system argue that this has facilitated collaboration between the universities in research impact assessment. The system also reflects a quite open perception of the term research impact. It acknowledges that researchers cannot fully control the outcomes of research they conduct, or research projects they are part of, but still it requires/encourages researchers to report potential future impacts, how this potential impact will be achieved and what stakeholders they (intend to) collaborate with (Swedish Research Council, 2017).

In 2018 the Swedish Research Council was assigned to develop and propose national indicators for the Swedish government's bill on research and higher education. One of the sub-goals of the bill holds that "*engagement and societal impact shall increase*". While the Swedish Research Council argues that it is insufficient to evaluate societal impact by standardized indicators, they still did. The two indicators they identified are 1) Share of the population with higher education and 2) number of publication accessible through open access.

⁵ <https://impact.ref.ac.uk/casestudies/>

There is arguably a difference between share of population with higher education, potential impact of a research project and assessing impacts of research carried out 20 years ago, yet all systems aim to evaluate the same thing. This vague or broad definition of research impact is quite representative for the overall field. Still, these systems ought to capture societal impacts from a variety of research fields. An evaluation study of the REF2014⁶ found 3709 unique pathways from research to impact among the conducted case studies (Kings College of London and Digital Science, 2015). This implies that it is not possible to evaluate the societal impact of research in one standardized way. Nevertheless the importance of the system itself has managed to increase researchers' interest in societal interaction (Kings College of London and Digital Science, 2015, Swedish research council, 2018)

7.4 Conclusions

Current societal challenges and the increased weight put on explaining, achieving, monitoring and evaluating research impact, call for increased focus and priority on impacts in research. Researchers are often expected to assess and explain the societal impact of their research by research funders, universities or national agencies. However, the term research impact is quite vague. The impacts of research vary in depth and complexity, and across time, and different types of impacts (or effects) are often discussed as if they were the same thing. In order to conduct a meaningful assessment these concepts must be structured in a coherent manner.

From a researcher's perspective it might be useful to evaluate the effects of research based on what you can control, influence and have an interest in contributing to. This control-influence-interest framework acknowledges that research impact is not a linear process, yet it helps researchers distinguish different levels of research effects and recognize that researchers typically cannot create societal impacts (of some magnitude) on their own. It is not impossible but it is very rare. Assessment of research impact is then about registration of outputs and evaluations of how these outputs come in use. Many outcomes of research projects might also be unintended and unexpected. This makes it difficult to evaluate the effects of research based on a standardised set of indicators. Evaluation methods are hence often qualitative and based on descriptions of the process from research to impact, such as *stories of change or impact case studies*.

Besides formal recording of research impacts, research impact assessments often aim at increasing researchers' interest in interacting with non-academic stakeholders. The process of evaluating research impact is not solely about assessing the effects of research but also an opportunity to review what contribution your research can make to society, and identify measure to achieve that?

⁶ REF (Research Excellence Framework) is the new system for assessing the quality of research in UK higher education institutions (<https://www.ref.ac.uk/2014/>)

Appendix

Tool 1: Explaining the essence of your research - The Message Box

Tool 2: Who are your stakeholders?

Tool 3: Graphical mapping of stakeholders

Tool 4: Analysing the authority and interest of stakeholders

Tool 5: A plan for stakeholder interaction

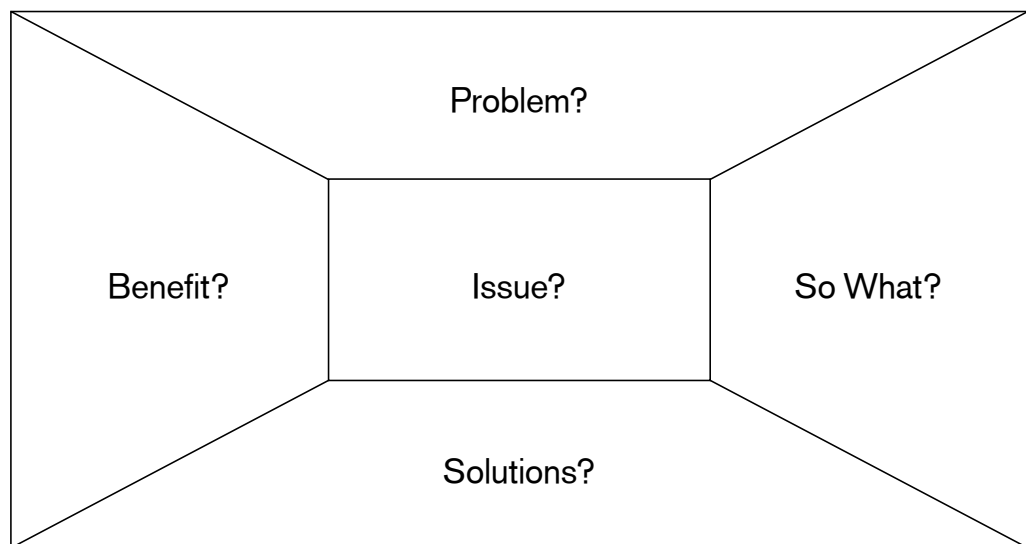
Tool 6: Monitoring matrix for stakeholder interaction activities

Tool 1: Explaining the essence of your research –The Message Box

The Message Box⁷, is a useful approach that prepares researchers to explain their work regardless of the angle from which the conversation starts. It is equally useful for communication with policy makers, farmer cooperatives, journalists or local governments.

The Message Box forces you to think through five questions that help you set your research in context.

- Issue: In broad terms, what is the overarching issue or topic?
- Problem: What is the specific problem or piece of the issue I am addressing?
- So What?: Why does this matter to my audience?
- Solutions: What are the potential solutions to the problem?
- Benefits: What are the potential benefits of resolving this problem?

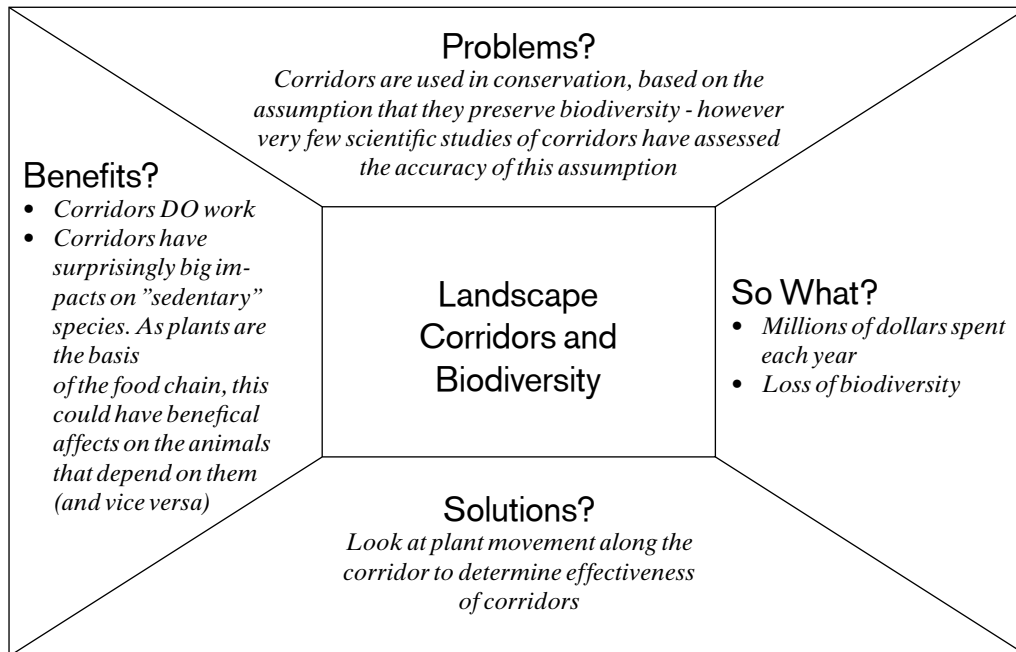


The Message Box is structured in a format that does not prescribe a certain order for communication. These questions should be answered in one or two sentences. This is not easy. Typically you need to try, refine, try again etc.

Example: Message box for “Corridors increase plant species richness at large scales”.

Ellen Damschen applied the Message box to a paper she had written with colleagues, Damschen et al. (2006) Corridors Increase Plant Species Richness at Large Scales. *Science*. Vol. 313. no. 5791, pp. 1284 – 1286. Below you can see the Message box she prepared for engaging with the media and the abstract of the paper.

⁷ Baron, Nancy, *Escape from the Ivory tower – a guide to making science matter* <http://www.escapefromtheivorytower.com/>



Source: http://leopoldleadership.stanford.edu/sites/default/files/MessageBoxExamples_Damschen&Brotz.ppt.pdf

Abstract

Habitat fragmentation is one of the largest threats to biodiversity. Landscape corridors, which are hypothesized to reduce the negative consequences of fragmentation, have become common features of ecological management plans worldwide. Despite their popularity, there is little evidence documenting the effectiveness of corridors in preserving biodiversity at large scales. Using a large-scale replicated experiment, we showed that habitat patches connected by corridors retain more native plant species than do isolated patches, that this difference increases over time, and that corridors do not promote invasion by exotic species. Our results support the use of corridors in biodiversity conservation

For more guidance see:

Baron, Nancy, *Escape from the Ivory tower – a guide to making science matter*
<http://www.escapefromtheivorytower.com/>

<http://images.nationalgeographic.com/wpf/media-content/file/OCEDMessage-Box-cb1325007760.pdf>

http://leopoldleadership.stanford.edu/sites/default/files/MessageBoxExamples_Damschen&Brotz.ppt.pdf

Tool 2: Who are your stakeholders?

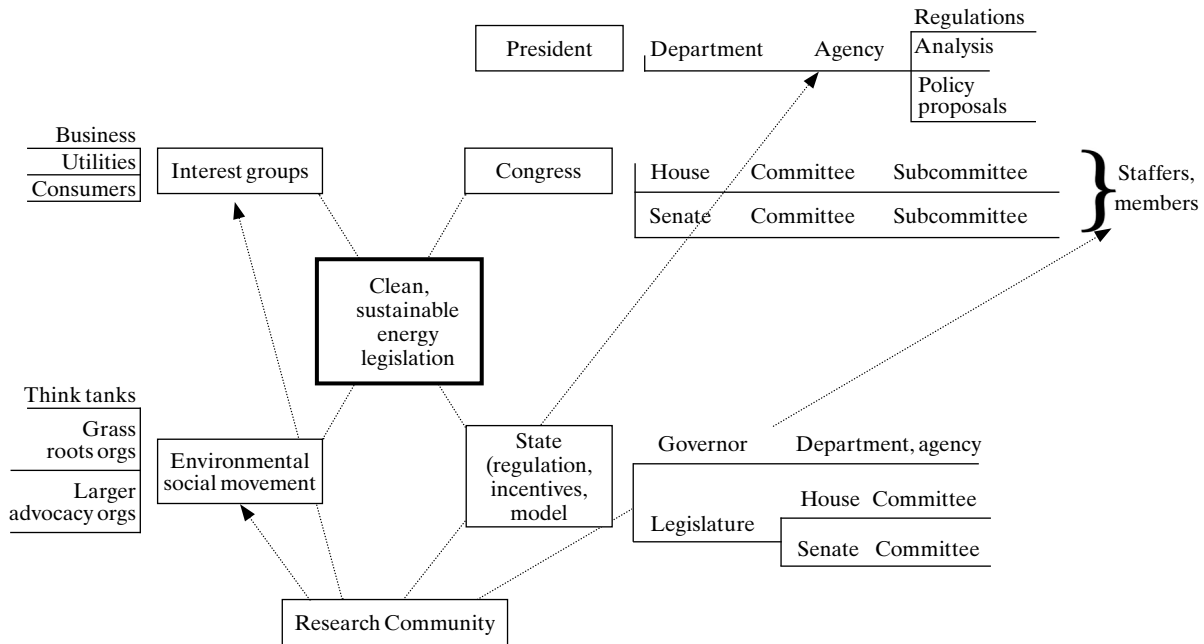
This tool helps you map national and international stakeholders from the public and private sectors, civil society and academia. It provides a simple structure for deciding who to engage with, why and how. It also includes a column in which you list current connections with the stakeholders or ideas on how to strengthen your contacts. Involve colleagues as well as people outside your research group in the compilation of a potential stakeholder list. Tools 1–2 are strongly related. Look at all of them and decide which ones make the most sense for your work. Start off with an open attitude and include many stakeholders rather than few. You will prioritise among the suggested stakeholders later on.

Stakeholder (name of organisation, group or individual)	Who?	Why and when interact? (Short description of why and when, e.g. problem formulation, knowledge production or communication of results)	Mode of interaction (What type of interaction could be relevant?)	Contacts (List existing contacts with the stakeholder or ways to make contact)
<i>Private sector</i> stakeholders: e.g. business associations, individual companies, farmers				
<i>Public sector</i> stakeholders: e.g. parliament and ministries, agencies, municipalities, regions, EU, UN				
<i>Civil society</i> stakeholders: e.g. non-governmental organisations, community based organisations, unions				
<i>Academia</i> stakeholders and think tanks: e.g. other research groups or research organisations, knowledge brokers, boundary organisations ⁸				

⁸ Knowledge brokers: actors that translate scientific knowledge into knowledge relevant for the stakeholder. Boundary organisation: an arena where researchers can meet with stakeholders with the purpose of increasing the relevance of and possibility for stakeholders to understand scientific knowledge.

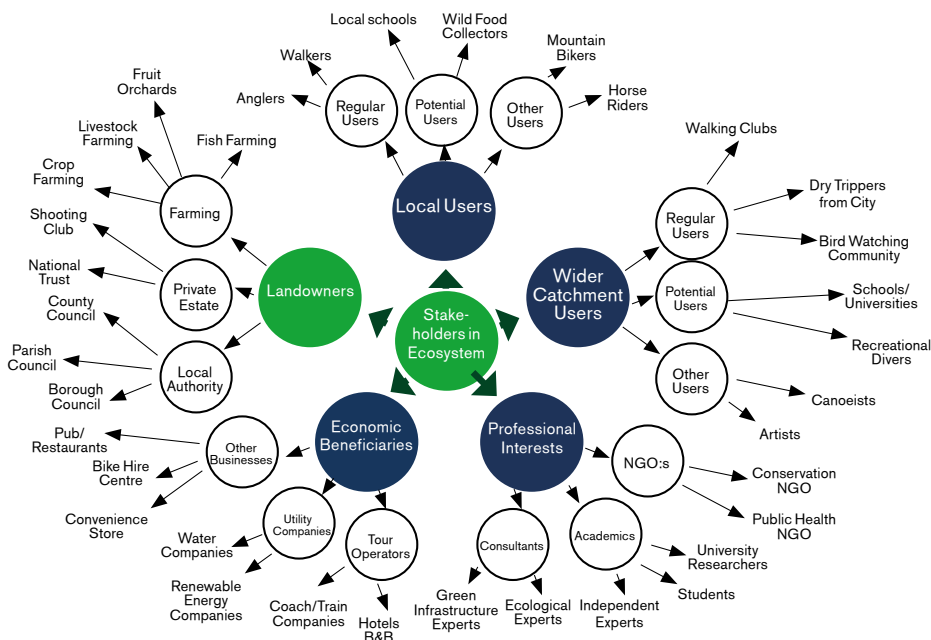
Tool 3: Graphical mapping of stakeholders

It is often useful to map stakeholders related to a research project in a graphical form. Below are two examples of how this can be done. The first example maps various stakeholders related to the US clean energy legislation and shows common links among them and with researchers. The mapping can be made with different focus levels, ranging from identifying relevant organisations to identifying key subgroups or even individuals.



Source: Badgett, 2015

The example below illustrates how a great number of stakeholders can be identified and categorised in relation to a particular ecosystem.



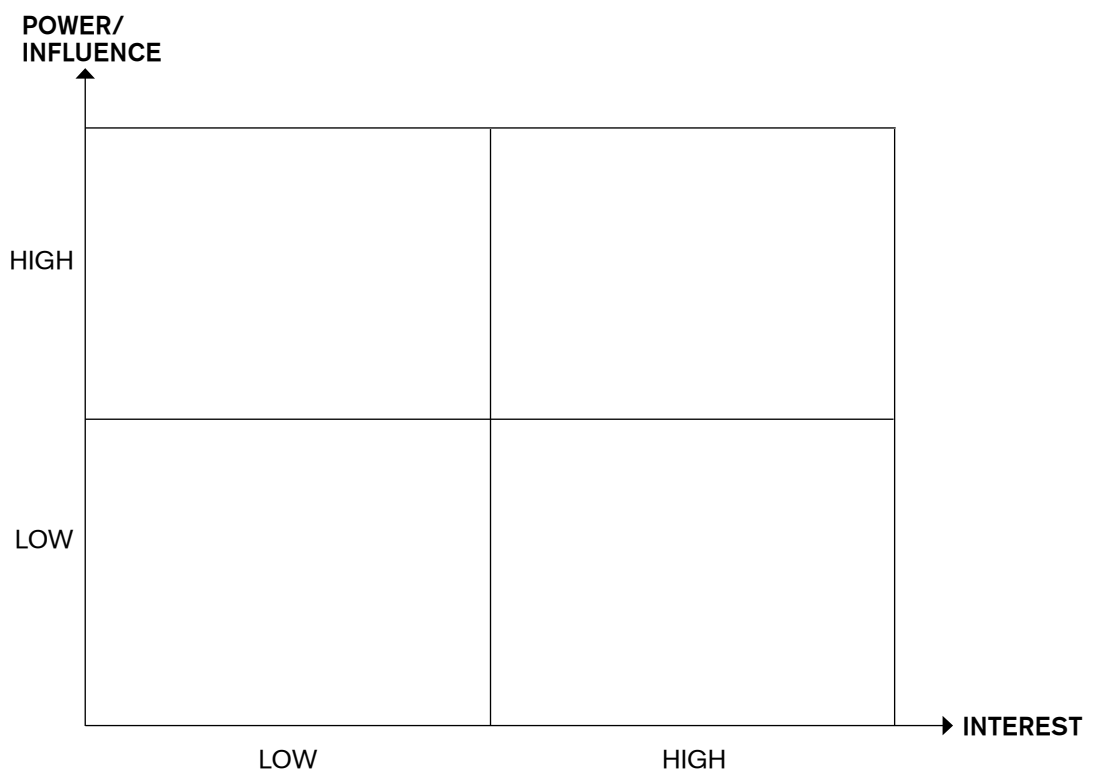
Source: Durham et al., 2014

Tool 4: Analysing the authority and interest of stakeholders

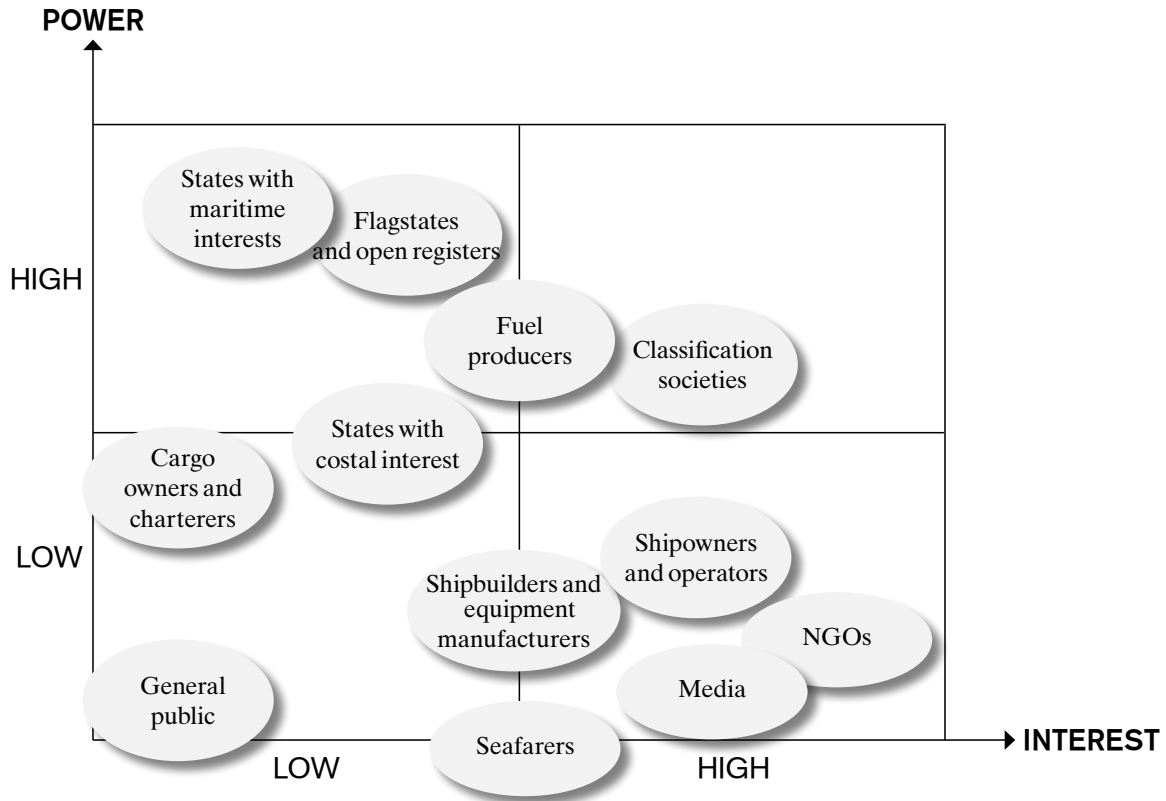
The tool proposed here is very basic and there are plenty of examples of more elaborate methods that can be used; see link further down. With input from previous steps, discussions with outsiders and possibly a policy map, try to insert your potential stakeholders into the grid below.

Focus on the 10–15 stakeholders that you consider to be most important. Stakeholders with ‘high’ interest typically have a strong professional interest in the topic or are likely to be substantially affected by any policy change. Stakeholders with ‘high’ authority have a substantial ability to promote or block a tentative policy change and therefore have an interest in using or not using new research on the issue/participate in the research process. In some cases, it may be relevant to specify whether you anticipate the stakeholder to be positive, negative or neutral to findings or proposals from your research. This can be done by adding +/-/0 before the name of the stakeholder.

Try to be as specific as possible; give names of government agencies, associations, interest groups, research groups inside and outside the country, or even individuals, companies, trade associations etc. It is common that certain groups within a ministry, government agency or business interest groups have a specific mandate or interest and may be more open to change.



See example below related to a research project on life-cycle assessment for future marine fuels.



Source: Source: Example of stakeholder analysis from PhD candidate Selma Bengtsson, Chalmers.

For an alternative template for stakeholder mapping and analysis, see [Fast Track Impact's Template for Stakeholder Analysis](#).

Tool 5: A plan for stakeholder interaction

Building on the previous steps you/your research group will now have to set priorities about who to engage with, when and how.

This should be based on the overall objectives of your research project and your ambitions concerning stakeholder interaction. If relevant, state one or two sub-objectives to help guide your plan for stakeholder interaction below.

A. Overall goal for stakeholder interaction within the research project:

B. Sub-objectives 1 and 2

Stage of research project	Stakeholder	Interaction activity	When	Issues to consider
Problem formulation				
Knowledge production				
Communication of results				
Ongoing activities throughout the research cycle (networking, responding to policy windows, briefs related to the theme, website etc.)				

Tool 6: Monitoring matrix for stakeholder interaction activities

With some examples of indicators.

Activity	Output		Outcomes/Impact	
	Indicator	Means of verification	Indicator	Means of verification
Website	No. visitors	Google Analytics		
Newsletter	No. of issues		Citations	Web search for citations in policy documents or other documents by stakeholders
Tweets	No.		Retweets	Twitter account
Press releases	No.		Citations	Web-search
Op-eds	No.		Citations	Web-search
Public seminars	No. of events No. of participants			
Workshop for government staff	No. of events No. of participants		Score on participants' evaluation	Survey
Science based advice to government agency	No. of meetings/ comments No. of policy oriented reports		Change in government policy Stories of change	References to research or policy reports E-mail survey interviews

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