

# Evidence-Based Politics: How Scientific Findings Influence the Political Decision-Making Process

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## **Abstract<sup>1</sup>**

*How do scientific findings influence political decision-making processes, and what specific tasks and challenges do scientists encounter when they meet policymakers in (international) political decision-making processes? This article shows that this process can be characterised by a number of ambiguities. Complex translation work is necessary to incorporate scientific findings into political decisions. Various modes and instruments can be used for this purpose. Scientists should be prepared for this and receive even better training in the necessary knowledge and skills as part of their education. The article makes suggestions on how the translation process can be designed and encourages greater integration of critical thinking approaches into the relevant degree programmes. This article examines the question of how scientific findings are incorporated into political decision-making processes. The role of scientists who are involved in such processes or who contribute to their success is that of active policy advisors. It is assumed that the tasks and components of this activity are relatively clear, for example in the preparation of specific decisions in coordination processes or in procedural consultations regarding longer-term projects, such as a bill based on scientific facts. Scientists contribute valid, fact-based knowledge; they evaluate political measures with regard to possible consequences against the backdrop of comprehensible, objective research findings. Whether scientists see themselves as advisors is open to question. However, it would also be possible to formulate their role somewhat more vaguely and say that although they work in scientific professions, they also influence the work of political decision-makers with their expertise. But what about the image we have of political decision-makers?*

## **Delimitation of Scope**

It is difficult to formulate a precise definition of a policy maker. But we need a clear understanding of this person and their role in the advisory and policy-making process if advice is to be successful, i.e. tailored to the target audience, comprehensible, goal-oriented and effective. Furthermore, the question of how roles and tasks are defined in international decision-making processes can be controversial, especially when the advice goes beyond a factual and relationship-relevant dimension (Watzlawick et al. 2011) and also has geopolitical or even security policy implications.

Further questions can be asked, such as how scientific findings are incorporated into policy. How do scientists proceed; through which channels do they succeed in exerting influence; which means are suitable for evidence-based policy advice? In the course of this, we can also ask how such influence is measured and whether there is such a thing as a benchmark for successful policy advice. The consequences of the possible answers are key benchmarks for the training and

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further education of researchers. It is not uncommon for scientists to be involved in international project work without being familiarised with the political options for action that arise from their work.

This article is intended as an introduction to the topic and will not be able to provide all the answers. The starting point for these considerations is, on the one hand, the results of a multi-year EU project on science diplomacy (“Using science for/in diplomacy for addressing global challenges”, S4D4C 2021). Another starting point is observations from a project for the United Nations Environment Programme (Müller et al., 2023, unpublished). This programme is currently preparing the comprehensive GEO 7 report (Global Environment Outlook, compare GEO 6), for which a large group of scientific authors will be actively involved in the editorial process. A significant part of the GEO is devoted to the question of how new scientific findings, which are already available in condensed form in climate and environmental reports, for example, can be incorporated into the future decisions of policymakers.

### Points of Departure

In principle, the political decision-making process should take scientific findings into account at all stages, including the formulation, implementation, evaluation and revision of political decisions. Of course, the reality of political decision-making is influenced by many other factors. Political decision-making is not linear, but rather resembles a ‘network’ in which various interest groups participate, including representatives of government, business, civil society and the media. Researchers play an important role in this process, as they provide scientific information for political strategy and opinion-forming.

The range of scientific knowledge has increased enormously. This poses a variety of challenges for policy-making and, in particular, for the contribution of scientists to policy advice: it is necessary to select context-appropriate information and evaluate its quality for political decision-makers. The legitimacy of using one source over another must be substantiated. Ambiguous or even contradictory scientific findings – despite correct procedures and compliance with all rules – must be assessed in terms of their significance and possible effects and presented in a comprehensible manner (cf. Sienkiewicz/Mair 2020; Sarewitz 2004). At the same time, science should not be (unilaterally) exploited by politicians to push through questionable interests of political decision-makers. Political preferences should not lead to overly simplistic or one-sided adoption of scientific findings. Successful scientific policy advice is a two-pronged process.

Various ambiguities can arise when scientific findings are incorporated into political decision-making processes. Renn (2020) distinguishes between interpretative and normative ambiguities: an “interpretative ambiguity” can arise due to a variability of legitimate interpretations based on otherwise identical observations or data evaluation results (Renn 2020, 96). Different interest groups may have very different perspectives on risk, depending on their value preferences or moral standards. As an example, he cites the different assessments that experts and laypeople sometimes make when group members are personally affected.

“Normative ambiguity” refers to divergent references to findings and is based on different perceptions of what is desirable or permissible, for example against the backdrop of different ethical

standards, assessments of quality of life or the social distribution of risks and benefits. Examples of this include the assessment of the health hazards of passive smoking or the subsidisation of means of transport in urban centres with already existing differences in air pollution (Renn 2020, 97).

One approach that helps to adequately model these ambiguities is the Multiple Streams Framework (MSF), originally developed by John Kingdon (1984). It serves to illustrate the complexity of the process by which basic assumptions and insights are incorporated into political decision-making. Kingdon argues against the assumption that actors always act rationally. He contends that there are many different solutions to every political problem and that the assumption that rational action is always possible actually reduces the efficiency of political decision-making processes (cf. Hoefer 2022, 2). The MSF establishes a connection between three streams: 1) the *problem stream* (a common perception of the problem among the various actors), 2) the *politics stream* (political decision-making processes and forces that come into play, among other things, in the competition for power within the structure of a party landscape, in coalitions, and before elections), and 3) the *policy stream* (positions of political communities and competition between political ideas or campaigning for acceptance of proposed solutions). These streams form a structure of influence, including when scientific findings are adopted.

The MSF can be understood as a complex system in which political agenda setting and political decision-making develop considerable momentum. The incorporation of scientific findings into political decision-making processes, opinion-forming processes, and existing or institutionalised systems must take the form of a translational effort. Factors that play a role in this dynamic must be taken into account. Some may have played little role until the findings were developed, such as normative-ethical evaluation standards, the significance of scientific findings for certain social interest groups, the thresholds of political acceptance in the discussion of politically sensitive issues, the topicality or explosiveness of certain topics in political discourse, and the configuration and preferences of a decision-making body. In addition, political processes are adaptive. They change with a different dynamic than the scientific knowledge process, and the varying fluidity of the systems can cause additional friction.

Translation is therefore an active, strategic process that requires careful planning. The following section will examine how this can be achieved. We will first consider the perspectives of two interlocutors in an interaction between a scientist and a policy maker, and then discuss practical approaches.

### **Approaches towards successful Policy Advice**

It may sound trivial, but shaping the transfer between science and politics is like a conversation between representatives of two worlds. However, these worlds are not completely separate; there are people in science who are also politically active and vice versa. In addition, representatives of both groups may share common beliefs. However, there are also stereotypical behavioural expectations associated with both worlds that can shape their interaction.

Scientists derive their credibility from the validity and traceability of their research. The validity of research results and theories is closely linked to Popper's principle of falsifiability.

Comprehensive and thorough empirical evidence, as well as standard peer review procedures, are important pillars for the significance of scientific findings. However, it is not the case that scientists always share their findings with all social groups with whom this would be theoretically possible with a certain amount of effort. This is often prevented by time constraints and competitive pressures. At the same time, it is also not the case that all people involved in policymaking are always equally interested in the latest scientific findings. Here, too, findings that support one's own political goals tend to be more advantageous than others.

While scientific work strives for value-free and objective knowledge gain, assessments in the political environment are an important starting point for decision-making. Political work can be strengthened and accelerated by scientific findings, for example by sensibly linking existing concepts with other concepts (to create synergies, lower participation thresholds, and mitigate any political controversy that may exist). One example of this is cooperation in the international fight against infectious diseases and pandemics.

Through beneficial side effects resulting from cooperation or political initiatives, measures can generate positive political resonance and develop new momentum in the longer term (such as the sustainable improvement of air quality through the switch to alternative renewable forms of energy). Political convictions are shaped by knowledge. However, political action often responds to acute needs. Brian Head has spoken in this regard of a necessary distinction between conceptual and instrumental knowledge (Head 2022).

When translating scientific findings for policy, a distinction can be made between "modes" of translation and "instruments" of translation. Modes include informing, advising, collaborating and educating (cf. Michaels 2009). The instruments include scientific evaluations and assessments, white papers, national science and technology reports, information sheets, briefing papers, talking points, expert consultations and presentations. International reports by multilateral associations that compile the results of scientific consultations and offer them for consideration in further political work are a good example of this. The aforementioned Global Environment Outlook (GEO), which is developed by the United Nations Environment Programme (UNEP), is based on the International Climate Report, but also on a large number of consultations with leading scientists around the world. It contains a comprehensive presentation of the state of the art on environmental issues and a detailed presentation of possible environmental policy conclusions and measures. Science diplomacy can play a useful role here by working closely with countries to initiate and finalise bilateral or multilateral strategies and agreements as well as specific projects, such as calls for proposals for funding measures.

With regard to the modes mentioned and their design, reference can first be made to two of the interpretative "turns" in recent social sciences: 1) the "iconic" turn and 2) the "narrative" turn. These have been documented in many places, conceptualised and made usable (Bachmann-Medick 2016).

Re 1): Scientists can use iconic elements to steer the mode and thus the effect of political texts, speeches and media content. One example is infographics, which allow for an appropriate level of complexity and information density and can be an important tool for evidence-based policymaking (see MicrobiomSupport 2020). In visually communicative politics, images are political

tools used to communicate messages, manipulate opinions and construct identities. The design of visual discourses can influence power relations, the framing of findings in terms of content, and the way in which meaning is constructed. This technique is already widely used, particularly in public campaigns, for example in the form of warnings on tobacco products.

Re 2): Narrative translation of scientific facts uses a narrative as a vehicle for scientific knowledge. It draws on the distinction between narrative rationality and scientific rationality (cf. Fisher 1987). A story generates its credibility through a coherent narrative style, through congruent references to the listeners' knowledge of the world, and through the convincing attitude of the narrator. By integrating the listeners as protagonists into the story, the narrative takes on an attractive form. Furthermore, descriptions of the context and other narrative stylistic details can motivate learning experiences and guide shared experiences. The Narrative Policy Framework describes four components that every narrative needs: setting, characters, plot and moral (Jones/Crow 2017). Stories can present problems and their solutions, name heroes and offer conclusions. Typical examples are narratives that, in the context of climate change, paint dystopian scenarios for the future that will be influenced by political decisions. Depictions of a world with 1.5 degrees or three degrees of warming and the associated "morally" correct decisions are designed as learning practices. Scientists- can draft these narratives and incorporate them into political discourse, for example in scientific information programmes, podcasts, videos or even petitions, policy briefs and more.

Finally, virtual or face-to-face forums can be created for encounters between scientists and policymakers. The instruments and modes mentioned above can be fully exploited there and, for example, follow their own communication plan – compare, for example, the communication services offered by the Centre on Knowledge Translation for Disability and Rehabilitation Research (KTDRR 2023). In this way, those affected can be addressed, involved and actively participated as an important stakeholder group. The co-creative process, a bottom-up approach, is another mode that can be usefully incorporated into the agenda process of political strategy formation and decision-making.

### **Balancing the Results: Need for further Educational Opportunities**

The political decision-making process is lengthy and complex. The role that researchers can play in this process, or rather the role that they must play to a greater extent due to the major challenges that exist, should be further developed with a view to improving effectiveness. Critical thinking should be a basic component of various educational programmes, both in the study of social sciences and natural sciences and in in-service training, and should be taught and practised as an important skill. Among other things, critical thinking forms a reference point for the construction of actor identities, for the identification of potential for improvement in goal-oriented development processes, and, in general, a fundamental methodological competence for reviewing the validity and reliability of common procedures and methods. This should also be used for the communication of scientific findings to policymakers.

Various pedagogical approaches can be used to promote critical thinking in the training of policy advisors. These include, for example, problem-based learning, international case studies, discussions, experiential learning, debates and collaborative learning activities. Such methods

encourage learners to think actively, analyse information, consider different perspectives and defend their own ideas. New methods based on visual and narrative paradigms, for example, can be further developed in a targeted manner – especially in those disciplines where science communication needs improvement. In addition to individual techniques such as visualisation and storytelling, the administration, design options and modes of science communication need to be fully developed and incorporated into training. Ultimately, this also includes looking at soft skills, for example in negotiation training or in raising awareness of political decision-making processes.

## Conclusion

This article introduced the role of scientists and policymakers who come together in (international) political decision-making processes. These two groups may speak different languages. The translation efforts required to bring the decision-making processes to a successful conclusion are demanding and the framework conditions are complex. Greater attention is therefore needed with regard to the roles played, the contexts of interaction and the scientific communication that needs to be carried out. The latter applies both to the design of communication and to the prerequisites necessary for this.

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## References

- Bachmann-Medick, D. (2016): Cultural Turns. New Directions in Cultural Studies. Hamburg.
- Fisher, W.R. (1987): Human communication as narration: toward a philosophy of reason, value, and action. Columbia.
- GEO 6 (2019): United Nations Environment Programme's (UNEP) sixth Global Environmental Outlook (GEO). URL: <https://www.unep.org/resources/global-environment-outlook-6>, accessed on 12 May 2023.
- Head, B.W. (2022): Wicked Problems in Public Policy. Cham.
- Herweg, N. (2017): Theoretical Approach to the Policy Process: The Multiple Streams Framework. In: European Union Policy-Making. International Series on Public Policy. Cham. URL: [https://link.springer.com/chapter/10.1007/978-3-319-49400-5\\_2](https://link.springer.com/chapter/10.1007/978-3-319-49400-5_2), accessed on 12 May 2023.
- Hoefer, R. (2022): The Multiple Streams Framework: Understanding and Applying the Problems, Policies, and Politics Approach. In: Journal of Policy Practice and Research (2022) 3, 1–5. URL: <https://doi.org/10.1007/s42972-022-00049-2>, accessed on 12 May 2023.
- Jones, D./Crow, D. (2017): How can we use the science of stories to produce persuasive scientific stories? In: Palgrave Communications (3) 53. URL: <https://www.nature.com/articles/s41599-017-0047-7#citeas>, accessed on 12 May 2023.
- KTDRR (2023): Centre on Knowledge Translation for Disability and Rehabilitation Research (KTDRR). Website. URL: <https://ktdr.org/>, accessed on 12 May 2023.
- Kingdon, J.W. (1984): Agendas, Alternatives, and Public Policies. Boston.

- Michaels, S. (2009): Matching knowledge brokering strategies to environmental policy problems and settings. In: *Environmental Science & Policy* 12(7), 994–1011. URL: <https://doi.org/10.1016/j.envsci.2009.05.002>, accessed on 12 May 2023.
- MicrobiomSupport (2020): Horizon 2020 project supporting the European Union’s “Food 2030” strategy. URL: <https://www.microbiomesupport.eu/infographics-new-format-and-additional-languages/>, accessed on 12 May 2023.
- Müller, A.P./Flink, T./Piaget, E./Rungius, C./Young, M./Josten, M./Meyer, N. (unpublished) (2023): From Science to Policy. Translating Scientific Knowledge into Policy-Making Processes for the Environment. Handbook for a UNEP Master’s module at universities. In collaboration with the Global Council for Science and the Environment. Script.
- Renn, O. (2020): Risk Governance: From Knowledge to Regulatory Action. In: Glückler, J./Herrigel, G./Handke, M. (Eds.): *Knowledge for Governance*. Cham. 93–112.
- S4D4C (2021): Using Science for/in Diplomacy for Addressing Global Challenges. Project under the European Union’s Horizon 2020 research and innovation programme. Grant agreement No 770342, 2018–2020. URL: <https://www.s4d4c.eu/>, accessed on 12 May 2023.
- Sarewitz, D. (2004): How Science Makes Environmental Controversies Worse. In: *Environmental Science & Policy* 7(5), 385–403.
- Sienkiewicz, M./Mair, D. (2020): Against the Science-Policy Binary Separation. In: Šucha, V./Sienkiewicz, M. (Eds.): *Science for Policy Handbook*. Amsterdam. 2–13.
- Watzlawick, P./Beavin, J.H./Jackson, D.D. (2011): *Pragmatics of Human Communication*. New York.