



# Royal Netherlands Academy of Arts and Sciences (KNAW) KONINKLIJKE NEDERLANDSE AKADEMIE VAN WETENSCHAPPEN

## Joint evaluation for joint governance of challenge-oriented research

van Drooge, L.; Deuten, J.

2016

### **document version**

Early version, also known as pre-print

[Link to publication in KNAW Research Portal](#)

### **citation for published version (APA)**

van Drooge, L., & Deuten, J. (2016). *Joint evaluation for joint governance of challenge-oriented research: (formerly known as: Evaluation and governance - and why the twain shall meet)*.

### **General rights**

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the KNAW public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain.
- You may freely distribute the URL identifying the publication in the KNAW public portal.

### **Take down policy**

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

### **E-mail address:**

[pure@knaw.nl](mailto:pure@knaw.nl)

## **Joint evaluation for joint governance of challenge-oriented research**

Leonie van Drooge and Jasper Deuten

Rathenau Institute, Anna van Saksenlaan 51, 2593 HW The Hague, the Netherlands

Corresponding author:

Leonie van Drooge

[l.vandrooge@rathenau.nl](mailto:l.vandrooge@rathenau.nl)

+31648199823

### **Summary**

We propose a novel way to understand evaluation of challenge-oriented research. We argue that challenge-oriented research requires specific modes of governance and research evaluation. Challenge-oriented research goes beyond conventional thematic or mission-oriented research programming. It concerns broader transformations in society, for instance the transitions towards sustainable energy systems or sustainable agriculture. It necessarily involves a broad range of stakeholders who may have different views on what the problem is and how it should be approached. Challenge-oriented research is part of a complex, non-linear, long-term, open-ended and contested transformation journey. This should be reflected in the governance and evaluation of this mode of research. We argue that 'joint' and 'in itinere' evaluation is crucial to learn how and what research contributes to broader, systemic transformations in society. It is also a necessary ingredient in building trust between various research funders, multiple research performers, users and other stakeholders that research helps society to move forward a step in the (open-ended) transformation journey.

For this type of research, traditional ways of research evaluation do not suffice. New evaluation methods and practices have been developed over the last years. But so far, the experience with these methods for the evaluation of challenge-oriented research is limited. We argue that understanding evaluation as a joint governance process is key. We present a number of projects concerning evaluation of challenge-oriented research and the lessons learnt.

### **Introduction**

Science is increasingly called upon to contribute to finding and developing solutions for grand societal challenges. Scientific research is perceived as an integral part of innovation journeys (Van de Ven et al, 2008) towards innovative solutions. It has become more important for scientists to demonstrate how they help shape such innovation journeys towards finding solutions for societal challenges and problems.

Typically, societal challenges require broader transformations in society, for instance transitions towards sustainable energy systems or sustainable agriculture. Individual research projects and programmes need to contribute to such broader transitions. Moreover, researchers need to show the quality and relevance of their research to a broad range of stakeholders who may have different views on what the problem is and how it should be approached.

New modes of scientific research have emerged that allow for a challenge-oriented approach and a more effective incorporation and engagement of society (Gibbons et al. 1994, Nowotny et al. 2001). Science is becoming more 'open' for the involvement of other academic disciplines, research institutes, businesses and societal organisations. Challenge-oriented research is typically transdisciplinary and based upon collaboration and co-creation by various actors. This differs from

mission oriented research, such as the Man on the Moon or the Manhattan projects. It refers to wicked problems, such as poverty in the ghetto. According to Nelson (1977), putting a man on the moon was a 'simple' problem: there was general agreement on the problem, there was a single owner of the problem, and there was a single technological solution. The ghetto is a wicked problem: every stakeholder has its own visions and perceptions of the problem, there is no clear owner of the problem, and there are no clear solutions nor can solutions easily be translated from one ghetto to the next. Challenge-oriented research is part of a complex, non-linear, long-term, open-ended and contested transformation process.

As part of these new modes of research, new governance arrangements have been developed to guide and steer research towards societal needs. For example when a broader and more diverse range of stakeholders is involved in agenda and priority setting. The Dutch National Research Agenda (2016) is an interesting example, where citizens were asked to contribute research questions as well. Medical charities in the Netherlands have developed practices to include end-users (patients, doctors, carers) in agenda setting and project selection. Funding and spending arrangements increasingly include a more heterogeneous mix of parties. This includes co-funding by various public and private sector actors as well as allocation to multi-party (public-private) consortia with complementary research and innovation actors. Finally, new arrangements for knowledge sharing and intellectual property have been developed (open access, open data), that still have to find a balance between protection and sharing.

New governance arrangements for challenge-oriented scientific research require new methods to evaluate the quality and impact of research. Conventional evaluation methods that primarily focus on scientific excellence and that are based on peer-review and scientometrics (e.g. journal impact factors, citation impact analysis), do not suffice. Scientific excellence is in most, if not all, cases only one element, or one type of activity, or one quality of the research.

### **Challenge oriented research requires a new evaluation approach**

Evaluation of challenge-oriented research relates to both the knowledge produced and its subsequent use, as well as the process of knowledge co-creation. It takes into account how, and to what extent, research contributes to shaping promising and/or effective innovation journeys that further societal transformations. In other words, challenge-oriented research requires a sophisticated theory of change.

Over the years research evaluation methods and systems have been designed and implemented that include stakeholders and that acknowledge the contribution of research to societal challenges (Donovan 2011, Bornmann 2013). Examples in practice vary and refer to ex ante as well as ex post evaluations. From ex ante evaluation of broader impacts in the US (National Science Foundation (NSF) proposals), pathways to impact in the UK (Research Councils UK (RCUK) proposals) and knowledge utilization in the Netherlands (research council NWO proposals), to ex post evaluations of social impact in the UK (Research Excellence Framework (REF) 2014) and relevance to society in the Netherlands (Standard Evaluation Protocol (SEP) 2015-2021).

In general, broader impact of research has become one of the key evaluation criteria in research evaluation by research funding agencies. In most of these cases the research is not driven by a specific challenge. It is up to the researcher to formulate a challenge or impact. At best, the funder has indicated the types of impacts, processes or stakeholders that are within the limits of what the funder has defined as impact. This is in line with the key condition of academic freedom. For challenge oriented research, however, the stakeholders involved are engaged in a joint innovation

journey. The impact they aim for, is jointly decided and relates to the challenge. A theory of change relating to this impact can play a central role in evaluation.

### **The close relation between evaluation and governance: theory of change**

At present, the question of what impact to evaluate, is often answered by proposing indicators that are available and quantifiable, such as patents or spin-offs. The challenge is to ensure that a realistic perspective on impact forms the basis of an evaluation. This is a joint effort, that includes the challenge that drives the funder(s). A related challenge is the development of adequate evaluation criteria, evaluation questions, indicators and methods. Again, this is a joint effort. A final challenge is to organise the involvement and engagement of multiple stakeholders in evaluation. This goes well beyond extended peer review. The consequence is that one has to take into account the variety of interests, possibly conflicting, of all included.

So the picture becomes even bigger. From evaluation of research excellence alone – that can be done through peer review – through evaluation of societal impacts – with the inclusion of stakeholders – to evaluation as a joint process with all involved – including the funder – and with a central focus on the challenge. Evaluation thus relates to far more than research alone.

Looking at evaluation this way, evaluation and governance are very similar. That might sound uninviting to some, but Hill and Lynn (2005) propose a non-hierarchical form of network-governance when they state that “governance as an organizing concept for public management reform reflects a widespread, though not universal, belief that the focus of administrative practice is shifting from hierarchical government toward greater reliance on horizontal, hybridized, and associational forms of governance”. Kuhlmann and Rip (2014) call for a tentative concept of governance for challenge oriented research, that is preliminary (temporarily limited). They argue that learning processes are key. A theory of change can support this form of governance.

A theory of change (Rogers, 2014) explains how an impact is understood to come about. It is a shared narrative concerning the causal relation between inputs, activities, outputs and impact. It is a joint understanding of the innovation journey and is best developed by all involved and affected. This includes research funders, research performers, intermediate and end users of research results. Note that research funders have a stake regarding the challenge that they have addressed in their funding instrument. They can be regarded as spokesperson for the challenge addressed.

Developing and using a theory of change can be regarded as a horizontal form of governance. From the theory of change, a number of evaluation or monitoring questions can be identified (Spaapen and Van Drooge, in preparation). These can relate to elements of the theory of change for which there is no evidence yet (Rogers, 2014). Activities or outputs, when understood as part of the theory of change or of the innovation journey, can serve as indicators in itinere, or on the way. They can be used to monitor the progress and route in the course of the project. In case the results differ from what was expected the theory of change can support learning. As a consequence of the learning, the theory of change can be adjusted. Douthwaite (2016) provides an example of an adjustments of a theory of change.

### **Examples of evaluation and governance**

One approach that seems particularly suited for the evaluation of challenge-oriented research is Participatory Impact Pathways Analysis (PIPA). Theory of change is the central element in PIPA. It was developed from earlier ideas in programme theory and pioneered within the Consultative Group on International Agricultural Research (CGIAR) Challenge Programme on Water and Food

(Douthwaite et al. 2007a; Douthwaite et al. 2007b from WorldFish). PIPA has been applied in a number of different contexts, originally to plan and monitor the impact of research for development projects, but also for other types of challenge-oriented research. Not all experiences with PIPA were entirely satisfactory, see for instance Spaapen and Van Drooge (2015) and Triomphe et al, (2015). We have used the lessons from these experiences in two projects that we have been involved in.

We developed an evaluation protocol for the monitoring and evaluation of a number of applied research organisations in the Netherlands. The development of the protocol involved extensive discussions with the ministries involved (funders) as well as with the research organisations. In the previous protocol, the ministries were at a great distance of the evaluation. In this protocol, the ministries are still not directly involved in the evaluation itself, but the process is designed in such a way that their goals and challenges play a crucial role during evaluation (Deuten et al, 2015).

Medical charities in the Netherlands feel a growing pressure from sponsors and patients to show how their activities have an impact. They have developed practices to improve the focus in research projects and programs on societal impact, especially in the phase of agenda setting and project selection. However, they still experience that once a project is approved, many of the researchers are more focussed on academic excellence than on societal impact. Some charities have indicated the need to redefine their role in the phase of research. We have developed a joint workshop for research managers of the charities and researchers in order to develop new forms of governance, specifically new evaluation and monitoring approaches, for the challenge oriented research projects of the charities.

A final experience that we will reflect upon is an effort that we haven't been involved in directly. It illustrates how governance and evaluation go hand in hand. A major mission oriented research organisation in the Netherlands has changed the way research and researchers are evaluated. (Benedictus and Miedema, 2016) The mission of the organisation is central to the evaluation. Research excellence is still an important criterion, but contrary to before, it is by far not the only criterion. The development of this new approach included discussions and inclusion of researchers, as well as major stakeholders, users as well as funders.

## References

Benedictus, Rinze and Frank Miedema (2016) Redefine excellence: Fix incentives to fix science. *Nature* Volume 538, 435-455

Bornmann, L. (2013): "What is societal impact of research and how can it be assessed? a literature survey" *Journal of the American Society for Information Science and Technology* Volume 64 (2), 217–233

Deuten, Jasper, Lionne Koens, Patricia Faasse and Barend van der Meulen (2015): *Protocol voor de monitoring en evaluatie van de Toegepast Onderzoeksorganisaties in Nederland* Den Haag: Rathenau Instituut

Donovan, Claire (2011): "State of the art in assessing research impact: introduction to a special issue" *Research Evaluation* 20 (3): 175-179

Douthwaite, B. et al (2007a): 'Participatory Impact Pathways Analysis: A Practical Application of Program Theory in Research-for- Development', *Canadian Journal of Program Evaluation* 22 (2) 127-159

Douthwaite, B., Schulz, S., Adetunji, S. O., and Ellis-Jones, J. (2007b): "Impact pathway evaluation of an integrated *Striga hermonthica* control project in Northern Nigeria" *Agricultural Systems* 92: 201-222

Douthwaite, B. (2016) *THEORY OF CHANGE | Using theory of change and impact pathways to leverage results*. <https://www.youtube.com/watch?v=YcyhrlZxo7Y>, assessed 19 October 2016

Drooge, L. van, Jong, S. de et al (2013) *Twenty years of research evaluation (Facts & Figures 9)* Den Haag: Rathenau Instituut

Dutch National Research Agenda (2016)

<http://www.wetenschapsagenda.nl/national-science-agenda/?lang=en>

Gibbons, m., C. Limoges, H. Nowotny, S. Schwartzman, P. Scott and M. Trow (1994): *The New Production of Knowledge: The Dynamics of Science and Research in Contemporary Societies*. London, Sage

Hill, Carolyn J., and Laurence E. Hill (2005): "Is Hierarchical Governance in Decline? Evidence from Empirical Research" *Journal of Public Administration Research and Theory* Vol. 15, no. 2

Edwin Horlings, Stans van Egmond, Rosalie Belder, Leonie van Drooge (2015) *Ontwikkeling van een visie op de rol van de Samenwerkende GezondheidsFondsen in het wetenschaps- en innovatiebeleid*. Den Haag: Rathenau Instituut.

Kuhlmann, S. & Rip, A. (2015): The challenge of addressing Grand Challenges. In: von Schomberg, R. (ed.): *The Future of Research and Innovation*. European Commission (in press)

Nelson, R. R. (1977). *The moon and the ghetto*. New York: Norton

Nowotny, Helga, Peter Scott and Michael T. Gibbons (2001): *Re-Thinking Science: Knowledge and the Public in an Age of Uncertainty*. London, Wiley

Rogers, P. (2014). *Theory of Change, Methodological Briefs: Impact Evaluation 2*. UNICEF Office of Research, Florence.

Spaapen, J. B. and L. van Drooge (2015): "Towards a network approach of research evaluation" in INRA: *Impacts of agricultural research - an approach of societal values*. Paris, Nov 2015

Triomphe B. (2015): "Towards a generic, comprehensive and participatory approach for assessing the impact of agricultural research in developing countries" at INRA: : *Impacts of agricultural research - an approach of societal values*. Paris, Nov 2015

Van de Ven, Andrew, Douglas Polley, Raghu Garud, Sankaran Venkataraman (2008): *The Innovation Journey* Oxford: Oxford University Press