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# Global challenges, Dutch solutions? The shape of responsibility in Dutch science and technology policies

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**ABSTRACT**

The Netherlands has a well-established tradition of gearing science and technology to economic interests as well as societal and ethical concerns. This article outlines how national dynamics in the Netherlands have not only contributed to the adoption of Responsible Research and Innovation (RRI) frameworks but also to a distinctly Dutch meaning and institutionalization of responsibility. It identifies three core features of the Dutch context that have shaped this meaning and institutionalization: 1) a strong focus on the societal and economic relevance of research and innovation, 2) a political culture that emphasizes inclusive deliberation and collaboration, and 3) a focus on integration and synergy with respect to RRI. The integration of RRI in a collaborative system of companies, government and universities is embraced as contributing to a global leadership of the Netherlands in response to grand challenges. However, this integrative approach also limits the potential of Dutch RRI to function as a disruptive concept that challenges the status of interactions between science, technology, and society.

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## Introduction

The brochure Global Challenges, Dutch Solutions by the Dutch Ministries of Economic Affairs and Education, Culture and Science (MEA and MECS 2014) confidently introduces the Netherlands as a global leader in socially responsible innovation. Dutch innovation is not only characterized as internationally competitive but also as unique in its integrative approach that brings together all societal actors. For example, the Dutch 'Top Sectors' policy is simultaneously introduced as an instrument for stimulating core sectors of the Dutch economy and as a contribution to solving global challenges including sustainable agriculture, climate change, food and mobility. All segments of Dutch society are supposed to contribute to this jointly economic and social enterprise (MEA and MECS 2014).

The Top Sectors policy is part of a broader, well-established tradition in the Netherlands of gearing science and technology to economic interests as well as societal and

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ethical concerns. For instance, in recent decades a lively academic culture has emerged that is concerned with technology assessment, science and technology studies and the ethics of emerging technologies. Furthermore, societal and ethical issues are emphasized not only in academic discourse but also in Dutch governance and in the funding of science and innovation. Examples include the Rathenau institute, which is the national technology assessment organization that gives advice to Dutch politics and policy, and the society-oriented funding schemes of the national science funding organization NWO (the Netherlands Organization for Scientific Research).

Given these traditions of Dutch engagement with wider impacts of science and technology, it is hardly surprising that the Netherlands has been an early adopter of ELSA (research on Ethical, Legal and Social Aspects) and RRI (Responsible Research and Innovation) in academic debates and in the governance of research and innovation. This includes the incorporation of ELSA in large-scale genomics research, for instance in the Centre for Society and Genomics and the Netherlands Genomics Initiative, and the implementation of RRI in NWO's Responsible Innovation (MVI) research funding program. These initiatives share a focus on interaction, coproduction, and anticipation in addressing the ethical and societal aspects of new and emerging science and technology (Zwart and Nelis 2009; Chadwick and Zwart 2013).

There is already a substantial body of Dutch RRI literature, but the relation between RRI and the broader political culture in the Netherlands has received little attention. This article aims to contribute to filling this gap, by outlining how national dynamics in the Netherlands have not only contributed to the adoption of RRI but also to a distinctly Dutch meaning and institutionalization of responsibility. It is empirically informed by 9 interviews and a workshop on RRI in the Netherlands with experts and policy-makers, and a content analysis of 35 reports and documents on Dutch science and innovation polices published over the last 5 years or so. Based on these materials, it identifies three core features of the Dutch context that have contributed to distinct meanings and institutionalizations of RRI in the Netherlands. While these features contribute to Dutch self-confidence as a 'global leader' in RRI and science and innovation more generally, they also run the risk of obscuring tensions between various economic and societal interests. In this sense, Dutch RRI in its current form has only limited potential as a disruptive concept that challenges the status quo of science and technology policy.

## Three core Elements of Dutch RRI

### *Science and innovation for the public good*

Current Dutch science and innovation policies are highly ambitious. The 2025 Vision for Science, in which the Ministry of Education, Culture and Science outlines the national science policy, aims to further strengthen the 'worldwide significance' of Dutch science in terms of its quality and productivity (MECS 2014, 11). The national enterprise policy, of which the Top Sectors innovation policy is a part, has the ambition for the Netherlands to be 'among the world's top-five most enterprising and competitive economies' (MEA 2016, 6). A central idea in these policies is that research and innovation are important keys to sustaining high levels of welfare and well-being, and that they should be governed towards this aim.

In recent years, the discourse about the societal and economic importance of science and innovation in the Netherlands has shifted. In interaction with international developments such as the Sustainable Development Goals of the United Nations and the Societal Challenges of the European Horizon 2020 program, solving societal challenges has become a main objective in Dutch science and innovation policies, including the Top Sectors policy (Kennis- en Innovatieagenda 2017).

The idea that science and innovation should serve the public good is also reflected in a pervasive emphasis on producing societal impact and economic value. A key concept that is used in this respect is 'valorization'. For instance, the 2025 Vision for Science mentions valorization as an important objective of scientific research that encompasses 'economic utilization of knowledge', 'using knowledge for solving societal problems', and 'contributing to societal debates' (MECS 2014, 40). The emphasis on impact can also be observed in the funding and evaluation of Dutch research. For instance, the Netherlands Organization for Scientific Research demands 'knowledge utilization sections' in applications for research funding, and the national Standard Evaluation Protocol for scientific research includes 'relevance to society' as one of the key assessment criteria (VSNU, NWO, and KNAW 2014).

### *Trust in inclusive deliberation and collaboration*

The Netherlands can be characterized as a high-trust society with a consensus- and collaboration-oriented political culture, in which inclusive deliberation between policymakers, experts and representatives of societal organizations plays a key role (Van Dijck and van Saarloos 2017). Moreover, the Netherlands has a 'history of public engagement in decisions affecting science and technology', for instance concerning energy and GM food (Hagendijk and Irwin 2006, 179). Current initiatives in science and innovation policy reflect this deliberative tradition, and also indicate that the emphasis on inclusion and collaboration has further increased in recent years.

This is exemplified by the National Science Agenda that was published by a broad coalition of organizations representing industry, academia, applied research, and science funding. This agenda aims to identify priority themes for Dutch scientific research through public engagement and collaboration. Its realization involved a public consultation that yielded 12,000 research questions, which were clustered into 140 main questions, and which were subsequently elaborated into 25 research themes by teams of researchers and representatives of NGOs and industry (Portfolio for Research and Innovation 2016). The third Rutte cabinet, which was sworn into office in October 2017, has adopted the National Science Agenda and the Top Sectors as the main frameworks for increasing and prioritizing research funding in the coming years (VVD et al. 2017).

This emphasis on collaboration and partnerships in research and innovation is also clearly present in the Top Sectors and the research and innovation system more generally. For instance, one of the interviewees argued: 'The interactive element in the Dutch knowledge and innovation domain, among the different parties, knowledge institutes and industries, is of a uniquely high level. […] That also makes the Dutch knowledge and innovation system very effective'. In a similar vein, Van Dijck and van Saarloos (2017) argue in their essay 'The Dutch Polder Model in Science and Research' that tight-knit networks,

cooperation, consultation and trust are vital features of the Dutch science system that have allowed it to 'punch above its weight'.

### *Responsibility as an integrated feature of research and innovation*

There are funding schemes and research programs in the Netherlands that explicitly focus on RRI; nevertheless, our materials indicate that responsibility is also a multiform, dispersed and integrated feature of Dutch research and innovation that is usually operationalized through other terms and concepts. Many of our interviewees had never heard of RRI, and both the interviews and the document analysis indicate that the Dutch translations of 'responsible' and 'responsibility' are not the preferred terms to designate societal and ethical aspects of research and innovation. However, it is clear that many aspects and dimensions of RRI, including public engagement, inclusive deliberation, diversity, ethical reflection, and openness and transparency, are well-integrated in Dutch policies and discourses on research and innovation. For instance, one of the respondents called responsibility 'a matter of course in how we work with each other'; another argued that RRI 'is kind of in the DNA of everything that we do, but we don't emphasize it that clearly'.

Responsibility, in the Dutch incarnation described above, is often perceived as complementary to, or synergetic with, other objectives and interests concerning research and innovation (see also section 2.1). For instance, some of the respondents argued that societal challenges can also be seen as a 'revenue model' or as 'markets of tomorrow'. Another respondent argued that societal challenges and scientific freedom need not be mutually exclusive: 'innovation and progress on big societal themes requires programs with extensive collaborations'; at the same time, such programs may provide ample space for scientists to 'follow their noses' and 'explore new ideas'. The integration of the MVI program and the themes of the National Science Agenda into the Top Sectors policy also exemplifies how RRI, societal challenges, public engagement, and industrial policy are seen as complementary in the Dutch context. Another example is the NanoNextNL program, which integrates risk assessment and technology assessment in nanotechnology R&D.

## Solidifying or challenging the status quo?

The articles of this special section indicate that RRI remains a contested concept with heterogeneous international meanings and forms of institutionalization. Our discussion of the Dutch context has outlined three features that are constitutive of RRI in the Netherlands. There can be little doubt that these features have contributed to a system that has been successful in many regards: the Netherlands has internationally one of the most active research communities on RRI and emphasis of global challenges has become ubiquitous in Dutch research and innovation.

In our interviews, the integration of RRI in a collaborative system of companies, government and universities was commonly embraced as contributing to a 'global leadership' of the Netherlands in responses to grand challenges. However, this integrative approach also limits the potential of Dutch RRI to function as a disruptive concept that challenges the status of interactions between science, technology, and society. For example, the ubiquitous talk about 'knowledge utilization' and 'valorization' in the Netherlands tends to treat economic and societal concerns as constituting a harmonious whole in which the

pursuit of Dutch economic interests and the creation of socially desirable futures are largely treated as interchangeable. Insofar as this imperative of integrating economic and societal impacts has become part of RRI in the Netherlands, it runs the risk of marginalizing substantial conflicts about the societal roles of science and technology.

For example, consider recent controversies about the commodification of Dutch academia that have been articulated in Halffman and Radder's (2015) 'Academic Manifesto' and led to novel forms of academic activism such as the Platform for the Reform of Dutch Universities. In direct contrast to the narrative of Dutch leadership in RRI, Halffman and Radder declare that 'we wanted a university more involved with society – exit the ivory tower through the science shop – but we got a university that has reduced 'society' to 'business' […] The gambit of the Netherlands as a knowledge society has failed and has now turned against us' (2015, 175). Halffman and Radder's blistering critique of managerial obsession with 'measurement, increased competition, efficiency, 'excellence', and misconceived economic salvation' (2015, 165) of Dutch universities constitutes a challenge that can easily become marginalized in a Dutch framing of RRI in which 'companies, institutions and the government work together on the solutions' (MEA and MECS 2014, 4) and where 'societal challenges form key growth markets for the business community' (MEA and MECS 2014, 7). This tension is also reflected in the widely praised MVI program that provides public funding for RRI under the condition of matching private funding. While this program has been crucial in building a Dutch RRI community, it excludes all projects that cannot prove harmonious integration of economic and societal interests through simultaneous acquisition of public and private funding.

While some of the tensions reflect unique characteristics of the Dutch context, they can also contribute to a more general understanding of national negotiations and institutionalizations of RRI. On the one hand, the Netherlands constitutes a success story that illustrates how RRI can become widely endorsed and jointly pursued by different societal actors. On the other hand, this integrative adoption also indicates that RRI can become tool for solidifying rather than challenging the status quo of interactions between science, technology, and society. In this sense, the Dutch context may illustrate a more general trade-off between national policy support for RRI and its ability to function as a disruptive concept that reconfigures national practices of negotiating societal concerns in science and technology.

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