

A framework for Responsible Innovation - under BIOTEK2021, IKTPLUSS, NANO2021 and SAMANSVAR

Version 1.0

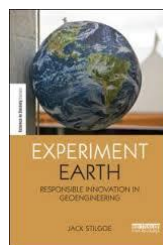
1. Societal responsibility and grand challenges

The new main strategy for the Research Council of Norway, *Research for Innovation and Sustainability* (2015–2020), clearly stresses the role of research in society and the societal mission of the Research Council. Societal responsibility is also emphasised in the current *Innovation Strategy for the Research Council of Norway*, which states that the Council will give priority to activities that are sustainable on three fronts: economic, environmental and social. The main strategy asserts that the Research Council must assume greater societal responsibility by promoting research and innovation activities that will yield benefits for society at large in the long term. This means ensuring that research is conducted in a societally responsible way, and that greater importance is attached to how research might contribute to solving the grand societal challenges.



2. Co-production and governance challenges

Research, technology development and innovation entail more than uncovering truth or charting out new and improved maps. These are activities that can potentially, and often directly, change the landscape in which we live. We are not only “reading” nature, more and more we are “writing” it as well. It is this trend – exemplified by e.g. synthetic biology or geoengineering¹ – that provides the background and motivation for our engagement in and for Responsible Research and Innovation (RRI). Research interacts and is interwoven with other social, cultural and historical factors. The intermingling, complexity and dynamics of this co-production means that governance schemes based on distance and clear task distribution between research, technology, innovation and policy are unproductive. It is in recognition of this systemic complexity and dynamics that the vision of Responsible Research and Innovation has emerged. RRI represents a new attempt to mitigate the asymmetry that Jerry Ravetz articulated as follows in 1975: “Science takes credit for penicillin, while Society takes the blame for the Bomb.”



¹ See, for example, Jack Stilgoe’s discussion of geoengineering as an “archetype of technology as social experiment” in Routledge: *Experiment Earth*, 2015. Link to Stilgoe’s Experiment Earth blog: <http://experimentearth.org/author/jackstilgoe/>.

3. Ambitions

Ambitions relating to RRI are formidable. As an expert group appointed by the European Commission states: “RRI seeks to connect research and innovation with the futures in which they play a part.” (Directorate-General for Research and Innovation (DG RTD), 2013). RRI has become an important concept in political narratives in recent years, particularly in Europe. RRI is a cross-cutting issue under Horizon 2020, and in November 2014 the Italian Presidency of the Council of the European Union presented *The Rome Declaration on Responsible Research and Innovation*. It is important to stress that RRI is a figuration; it is open, not “owned” by anyone and therefore invites and inspires experimentation, development activities and learning across established boundaries, sectors and disciplines. In this respect RRI is a means unto itself; in the words of René von Schomberg, a driving force behind early RRI efforts under the European Commission: “RRI is a transparent, interactive process by which societal actors and innovators become mutually responsive to each other...”. In October 2013, the UK’s Engineering and Physical Sciences Research Council (EPSRC) became the first European research council to draw up an RRI policy, creating a Framework for Responsible Innovation focusing on aspects that it expects will characterise RRI processes.

The logo for the Engineering and Physical Sciences Research Council (EPSRC) features the acronym 'EPSRC' in a bold, purple, sans-serif font. A thin green horizontal line is positioned above the letters 'P' and 'S', and another thin green horizontal line is positioned below the letters 'R' and 'C'.

Engineering and Physical Sciences
Research Council

[Framework for Responsible Innovation](#)

EPSRC is committed to develop and promote Responsible Innovation. This site reaffirms our own commitment and sets out our expectations for the researchers we fund and their research organisations.

4. RRI activities at the Research Council

International RRI efforts have inspired the Research Programme on Biotechnology for Innovation (BIOTEK2021), the Research Programme on Nanotechnology and Advanced Materials (NANO2021), the Initiative for ICT and digital innovation (IKTPLUS) and the Programme on Responsible Innovation and Corporate Social Responsibility (SAMANSVAR) to experiment together on several RRI-related activities.² The Research Council’s Programme on Ethical, Legal and Social Aspects of Biotechnology, Nanotechnology and Neurotechnology (ELSA) (2008–2014) was part of the overall international development.³ RRI projects under the large-scale technology programmes mentioned above are based on a paradigm shift in the fundamental understanding of the relationship between research and society; from linear models to interactive models that focus on interaction and networks across disciplines and societal sectors. The experimental activities show that further development of RRI will require building new knowledge, expertise, skills and capacity in the research and innovation system. At the same time, we see that the RRI dimensions identified by EPSRC have generic value. Parallels may also be drawn to needs for learning and development identified through long-term efforts in

² Relevant activities include: the joint funding announcement on RRI issued by the IKTPLUS initiative and SAMANSVAR programme with a deadline in February 2015; the NANO2021 programme’s RRI workshop for its research fellows in April 2015; the BIOTEK2021’s strategic initiative “Digital Life – Convergence for Innovation”; the learning platform for large-scale industry-relevant Researcher Projects; and the testing of the workshop method in autumn 2015.

³ See references to the Research Council’s work and programmes in: *Challenging Futures of Science in Society* (EC 2009); Owen et al. (Eds): *Responsible Innovation: Managing the Responsible Emergence of Science and Innovation in Society* (2013); “Responsible Research and Innovation” – report to ERIAB (March 2014).

Constructive Technology Assessment (CTA) in the Netherlands and Real-time Technology Assessment (RTTA) in the US.

5. Dimensions of RRI

The programmes referred to are seeking to advance efforts in and for RRI through learning and development activities in dialogue with the research environments they fund. In its RRI framework, EPSRC formulates new expectations not only for the research organisations receiving EPSRC funding but also for the organisation itself as a responsible societal actor. We will build further on an adapted version of the four dimensions of RRI identified by EPSRC. The expectation is that the *processes* in the research and innovation system will be increasingly characterised as:

1. **Anticipatory:** The Research Council has been repeatedly challenged when it comes to diagnostic and prospective competence and capacity. It has proven difficult to develop substantive diagnoses and correspondingly good prospects or figurations.⁴ Technologies may potentially have terrain-changing effects that are realised in complex, dynamic interplay with other societal forces. There is lack of knowledge and understanding concerning how to realise this potential in relation to desired societal development.
2. **Reflexive:** This involves employing expertise and capacity to better identify and discuss prerequisites for research and innovation activities, in the form of fundamental, often implicit, assumptions and frameworks of understanding, irreducible uncertainty and areas of ignorance. A greater degree of reflexivity is vital in order to provide directionality in research and innovation processes.
3. **Inclusive:** Societal dialogue has long been high on the agenda of the research and innovation system. The informative, explanatory monologue on the part of research was to be replaced by (societal) dialogue. After a period of seeking to develop various types of dialogue mechanisms, such as people's juries, lay public conferences, consensus conferences and focus groups, to "enable society to speak back to science," attention is now increasingly being directed towards the research environments themselves. What is being targeted are the skills needed to open up research and innovation processes, recognise the limits of one's own knowledge and competence, and the ability to ask for help in dealing with the potentially landscape-changing effects of these processes.
4. **Responsive:** Activities involving the first three dimensions are intended to provide continual input and substance to new governance practices. This entails the development of horizontal or distributed governance schemes that encourage collaboration with partners that may be affected by a research and innovation process. There is a need to open up different perspectives relating to dilemmas and irreducible uncertainty. This must take place via broad-based involvement, not only on the part of researchers from different disciplines, but also bringing on board policy actors, including research councils, trade and industry, interest organisations and society at large. The RRI method is a learning process with no fixed answers ("beyond rules and regulations").

⁴ See "A Good Council? Evaluation of the Research Council of Norway", Technopolis (2012); *Egenvurdering av satsingen på foresight og dialogbaserte arbeidsformer i Norges forskningsråd 2003–2005* (internal assessment of the Research Council's foresight initiative), Research Council of Norway (2006); *21-prosessenes samfunnsansvar* (societal responsibility in the "21" R&D strategy processes for the 21st century), Norwegian Board of Technology and Research Council of Norway (2015).

6. Promoting and monitoring RRI

RRI represents aspirations for development and learning in the research and innovation system broadly enough understood to encompass the research council level. RRI is motivated more by discontinuity than continuity in relation to tools/instruments that are becoming inadequate in the knowledge society. This applies not only to research ethics, but also to risk assessment and various regulatory mechanisms. RRI involves challenging exercises and assumes that the actors have something to learn from crossover collaborations.

In 2015, the European Commission published a new expert group report entitled *Indicators for promoting and monitoring Responsible Research and Innovation*.⁵ The report represents to a certain extent a Norwegian contribution to international RRI efforts, as the expert group was led by Professor Roger Strand of the University of Bergen. The report provides valuable input and inspiration for continued work with societal responsibility. For future RRI activities, the expert group contends that it is important to keep the following three issues in mind:

- The report *clarifies and discusses the knowledge base* in an exemplary fashion. The linear trajectory from basic research to applied research and then to development of products and services for the private and public sectors is rejected as a universal model. Given this framework of understanding, the report states that “RRI is ... a matter of the interface and interplay between R & I and the context in which it takes place...” (p. 5). This places new demands on the knowledge base, expertise, capacities and skills in the research and innovation system - both at an individual and institutional level.
- Based on an allotted mandate rooted in New Public Management, the expert group opens up RRI as a *learning and development project* for the research and innovation system, so broadly understood that it extends to the European Commission itself, along with other research funders. The discussion of the mandate concludes as follows: “the emphasis of impact evaluation is shifting from (end) product to process, and from verdicts/judgements to learning and improving” (pp. 12-13). The importance of productive interaction, also in the development of indicators, is emphasised: “From a network perspective, RRI is governed through the active participation of all relevant stakeholders in developing a monitoring policy and indicators.... These stakeholders should jointly decide what indicators best represent the kind of R & I that takes place in their particular network.” (p. 6)
- The expert group gives *governance* a key role in the realisation of RRI. At the same time, the understanding of governance changes as a result of the distribution of responsibility for governance: “The governance of science and innovation then becomes of central importance in this process. The question is, how does governance work in such dynamic and heterogeneous networks? ... Research and innovation is a complex system and **governance in complexity** is a wiser strategy than attempt at **governance of complexity**.” (p. 12). Here, the expert group points to the resources that have emerged from the work on CTA in the Netherlands, such as frameworks of responsible development, transition management and strategic niche management.

⁵ http://ec.europa.eu/research/swafs/pdf/pub_rri/ri_indicators_final_version.pdf

The RRI Poster

Look forward!

Think through!

Invite along!

Work together!

