

Discussion Paper on Public Engagement

Introduction

The approach to Public Engagement adopted in this discussion paper primarily seeks to encourage an increased utilisation of sciences in addressing social, economic, and ecological challenges confronting humanity in the 21st Century. The discussion paper also recognises the imperative of redressing perceptions of a deficit in trust between the multiplicity of publics and the enterprise of sciences through re-establishing and expanding confidence in scientific practices (albeit, more in some disciplines than in others)¹. As elucidated in a recent editorial in *Nature*: “(t)hat means that any attempt to use a *Pugwash*²-style approach to address today’s pressures should be strengthened by recent understanding of the importance of inclusivity — with a meaningful role for public engagement — and a place at the table for researchers from diverse backgrounds and from across disciplines, not only science and engineering” (*Nature*, 2019: 153)³.

The discussion paper focuses on two main issues, namely:

- a) The role and motivation of public funding agencies in mediating existing and potential tensions between science and society (its publics) in the context of broad and intricate complexities confronting the peoples of the world; and
- b) Reflections on expectations, approaches and good practices for public engagement that support the utilisation of public engagement as a strategy and mechanism by research councils to better enable a seamless interaction between the sciences and society (its publics) and thereby to bridge the gap between them.

This discussion paper is composed of four sections. Following this introduction, critical aspects of the contemporary conjuncture are elucidated and linked to the work of research councils. The third section defines public engagement in the context of Responsible Research and Innovation. The fourth and concluding section draws together the discussion paper and formulates a set of questions for further interrogation in regional consultations.

The Contemporary Conjuncture: Complex Interconnectedness in Times of Accelerated Change

¹ Heidi Ledford draws upon a recent Pew Survey (2 August 2019) to assert that “confidence in researchers might be on the rise but concerns about misconduct and potential conflicts of interest remain” (Ledford, H. 2019. US trust in scientists is now on par with the military, *Nature News*, 6 August). Ledford summarises that “survey participants who had more knowledge about science had greater confidence that researchers act in the public interest. And people reported that providing open access to data, as well as conducting independent reviews of research findings, would boost their confidence in the results” (ibid.).

² Cf. The Pugwash Conferences on Science and World Affairs which drew upon the Russell-Einstein Manifesto of 1955 to engage critically about the existential threats posed by nuclear weapons to life on earth. Pugwash has just completed its 12th Quinquennium in 2018. More details are available at: <https://pugwash.org/>.

³ Editorial. 2019. Scientists must rise above politics — and restate their value to society, *Nature* 572(7768): 153.

The human population is unevenly distributed across the regions of the world. Notwithstanding individual and social location, all the peoples of the world are increasingly being confronted by accelerated changes in their bio-physical environments (IBES, 2019)⁴. As noted by the Stockholm Resilience Centre, the changes in the environment have a relationship with the type and form of socio-economic and political development being pursued by all the countries of the world (Steffen et al., 2018)⁵. In approaching the third decade of the 21st Century, urgent attention is required to redress the unevenness in the quality of life experienced by the peoples of the world, and also to improve the quality of outcomes and impacts generated by scientific enquiry. The UN's Conference on Sustainable Development sought to reconcile the challenges of human and social development within planetary boundaries through the publication of a non-binding statement entitled 'The Future We Want,' and which was endorsed by 192 participating governments in 2012⁶. The latter mentioned process also gave rise to the formulation of seventeen sustainable development goals (SDGs)⁷ for the world system.

SDGs require good quality data and the availability of research capacities, scientific capabilities and innovative competences in the various National Systems of Innovation (NSIs). Research Councils that fund science for the public good are central to the provision of objectively verifiable evidence and the generation of scientific and technological capabilities in their respective NSIs and also for the global knowledge commons. Counterfactually, the rapid emergence and accelerated diffusion of alternative 'facts' and the emergence of 'post-truth'⁸ have served to negatively impact on the public's levels of trust in the enterprise of science. Research councils are often the agencies through which the tensions between the sciences and society (its publics) are possibly mediated whilst further advancing improved accountability for the investment of public resources and increasing the legitimacy of scientific praxis with society (its publics). Research councils not only have a role to directly mediate these relationships but also to ensure that a system is established where this mediation becomes intrinsic to the research process.

Efforts that seek to legitimise scientific praxis are also advancing though remaining imbued with ambiguities and differing definitions derived from national experiences and global circumstances. The realm of the public engagement in the sciences is, therefore, also not excluded from present disagreements, dissonances, and incoherencies in world systems. Vincent's analysis of 'public engagement' in the sciences recognises the concept as a buzzword which forms linguistic technologies, and which specifically "generate matters of concern and play an important role in trying to build consensus; ... set attractive goals and agendas; [and] ... create unstable collectives through noise" (2014)⁹. Motala defines 'socially engaged or public scholarship' as that which is "... derived from the co-construction of knowledge out of meaningful engagements between academics and the 'communities' and 'publics' of the university – especially such

⁴ IBES. 2019. Global Assessment on Biodiversity and Ecosystem Services: Summary for Policymakers, Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services, Bonn.

⁵ Steffen, Will; Johan Rockström; Katherine Richardson; Timothy M. Lenton; Carl Folk; Diana Liverman; Colin P. Summerhayes; Anthony D. Barnosky; Sarah E. Cornell; Michel Crucifix; Jonathan F. Donges; Ingo Fetzer; Steven J. Lade; Marten Scheffer; Ricarda Winkelmann; and Hans Joachim Schellnhuber. 2018. Trajectories of the Earth System in the Anthropocene, PNAS 115(33): 8252–8259.

⁶ UN. 2012. The World that We Want, Outcome Document of the United Nations Conference on Sustainable Development, Rio de Janeiro.

⁷ UNGA. 2015. The 2030 Agenda for Sustainable Development, Resolution 70/1, United Nations General Assembly, New York.

⁸ The Oxford English Dictionary recognised 'post-truth' as its 'Word of the Year' and defined it as 'relating to or denoting circumstances in which objective facts are less influential in shaping public opinion than appeals to emotion and personal belief' in 2016 (cf. NACI, 2017; amongst others).

⁹ Vincent, Bernadette Bensaude. 2014. The Politics of Buzzwords at the Interface of Technoscience, Market and Society: The Case of 'Public Engagement in Science,' Public Understanding of Science 23(3): 238–253.

communities that are ‘outside’ the university but reliant on the useful roles that can be played by critically thinking intellectuals in institutions of higher learning” (2014: 1)¹⁰. Some research councils are already invoking ‘citizen science’ as potentially linking earlier attempts at broadening the participation and access by society and the sciences such as the People’s Science movements and initiatives such as Science for the People, the Union of Concerned Scientists, Scientists for Global Responsibility, Science and Democracy World Forum, Citizen Science Foundation, and the BurGERSchaffen WISSen (GEWISS), amongst others. Research councils are considering various forms of public engagement in the ex-ante and ex-post evaluation phases, and in fulfilling additional mandates. In doing so, research councils increasingly need to ensure that the boundaries of sciences are clearly demarcated and the interface with society stabilised through their practice of establishing common sets of principles and good-practice guidelines.

Research Councils and Public Engagement

According to Dai et al., funding agencies and researchers have historically constituted the role of leading actors in defining research priorities and setting science agendas (2018: 10)¹¹. Dai and colleagues, however, note that “(t)hese processes have been criticised as having insufficient public engagement although there has been a growing trend of involvement of a diverse range of actors, especially in research sectors such as health, environment and urban planning” (ibid.). The previously mentioned working paper of the Organisation for Economic Co-operation and Development (OECD) drew on a study conducted by Mitton et al., funded by the Canadian Institutes of Health Research, which found that “(t)here is a very substantial body of literature from the past quarter-century exploring questions of public participation in priority setting and resource allocation. Much of this is conceptual, theoretical, or advocacy-oriented, but an increasing number of empirical case studies have been published” (2009: 226)¹².

A more recent study of 17 science granting councils¹³ in sub-Saharan Africa found that Research Councils “are essential actors in national systems of innovation” and “perform a number of crucial functions that contribute to the effective and efficient functioning of [national systems of innovation] such as: disbursing funds for R&D, building research capacity through appropriate scholarships and bursaries, setting and monitoring research agendas and priorities, advising on science, technology and innovation policies, managing bilateral and multilateral S&T agreements, assessing the communication, uptake and impact of publicly funded research and many more” (Mouton et al., 2014: 8)¹⁴. The study also found that “(s)uch councils ideally act as fair and disinterested agents of government whilst at the same time representing the interests of the scientific community nationally as well as regionally and internationally” and that “(t)hey are crucial “intermediaries” in the flow of international funding and technical support to R&D

¹⁰ Motala, Enver. 2014. Public Scholarship, Democracy and Scholarly Engagement, Education Policy Consortium, Department of Higher Education and Training, Tshwane.

¹¹ Dai, Qian; Eunjung Shin and Carthage Smith. 2018. Open and Inclusive Collaboration in Science: A Framework, OECD Science, Technology and Industry Working Papers 2018/07, Organisation for Economic Co-operation and Development, Paris.

¹² Mitton, Craig; Neale Smith, Stuart Peacock, Brian Evoy and Julia Abelson. 2009. Public Participation in Health Care Priority Setting: A Scoping Review, Health Policy 91: 219–228.

¹³ Research Councils include variations in nomenclature such as: science granting councils; national commissions for science and technology; national sciences councils; and national academies of science (Mouton et al., 2014). This Discussion Paper treats them all with equivalence.

¹⁴ Mouton, Johann; Jacques Gaillard; and Milandr  van Lill. 2014. Final Report: Study on Strategic Priorities, Objectives and Practices of Science Granting Councils in Seventeen Countries in Sub-Saharan Africa, Centre for Research on Evaluation, Science and Technology, Stellenbosch University, Stellenbosch.

performing institutions in a country” (op cite.). Table 1 lists the twelve areas in which Research Councils typically operate.

Table 1: Typical Functional Areas of Research Councils

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- 1) Disbursement of research grants (various categories);
 - 2) Disbursements of scholarships and loans (mostly Master’s and Doctoral students);
 - 3) Funding support for infrastructure development;
 - 4) Valorisation of results (dissemination and uptake of research reports and findings);
 - 5) Supporting scientific publishing/scientific journals;
 - 6) Advocacy to the STI;
 - 7) Collect data and statistics on S&T and R&D;
 - 8) Capacity-building/training of researchers;
 - 9) Policy advice;
 - 10) Setting research agenda/research priorities;
 - 11) Management of scientific collaborations and agreements; and
 - 12) Coordination of the [National System of Innovation].
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Source: Mouton et al., 2014: 10

Whilst the first three mentioned functional areas essentially fulfil traditional science funding responsibilities, the other eight functional areas broaden and widen the mandates of the research councils. Thus, in many contexts, the criticality of the research councils in ensuring the functioning of their respective NSIs are neither insignificant nor trivial. It is therefore imperative that the research councils in their role as intermediaries between the society in general and the science and technology practitioners in particular pay closer attention to enabling public engagement. The demand for such functionality is buttressed by various global, regional, and domestic surveys that reiterate a significant reduction in the levels of trust amongst people and the domains of the sciences.

Many research councils have already embarked on advancing public engagement. As noted by Venni Krishna, “(e)very Asia-Pacific country embraced and introduced policies relating to innovation in varying forms. Consultancy and collaborative links with industry being traditional forms of engagement, new policy, and institutional measures in technology transfer and innovation to engage with society and business enterprises are gaining prominence” (2019: 11)¹⁵. Australia sought “to develop the relationship between science and society, and thus enable the sciences to achieve greater value by creating ‘a scientifically engaged Australia’. By this we mean a society that is inspired by and values scientific endeavour, that attracts increasing national and international interest in its science, that critically engages with key scientific issues and that encourages young people to pursue scientific studies and careers” (Australia, 2010: 2-3)¹⁶. South Africa also declared that “(t)o fully realise the social, economic, and environmental benefits of the significant investment in science, research, and innovation, [...] a country must communicate and engage the wider community more fully in science and in an understanding of the knowledge economy to which [it] aspires” (NRF, 2012)¹⁷. These statements resonate well with the definition of public engagement as “intentional, meaningful interactions that provide opportunities for

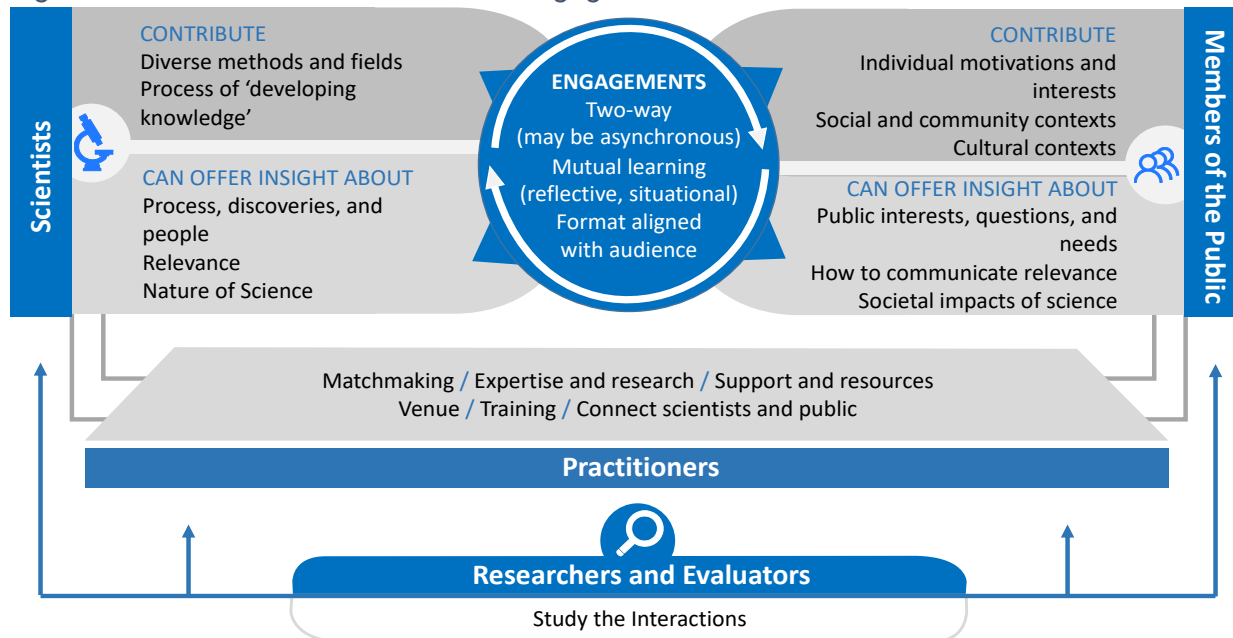
¹⁵ Krishna, Venni V. 2019. Universities in the National Innovation Systems: Emerging Innovation Landscapes in Asia-Pacific, *Journal of Open Innovation: Technology, Market, and Complexity* 5(43): 1-21.

¹⁶ Australia. 2010. *Inspiring Australia: A National Strategy for Engagement with the Sciences*, Department of Innovation, Industry, Science and Research, Commonwealth of Australia, Canberra.

¹⁷ NRF. 2012. *Science Engagement*, National Research Foundation, Tshwane and also: RSA. 2015. *Science Engagement Framework*, Department of Science and Technology, Tshwane.

mutual learning between scientists and members of the public” (CPEST, 2019)¹⁸. The importance of learning as a cooperative venture that enables both the public and the community of scientists and technologists to realise mutuality and co-dependency. Figure 1 provides a visual model to illustrate public engagement:

Figure 1. AAAS Visual Model of Public Engagement with Science



Source: CPEST, 2019

In Figure 1, the participants in the public engagement are scientists and the public (scientists are also members of the public). In some NSIs, a range of ‘practitioners’ who have specialist capabilities in facilitating learning, networking, and generally connecting sciences with society operate between scientists and the public. Such intermediaries are important and necessary stakeholders but may, however, be insufficient for the complexities of our combined, uneven, yet common global conjuncture. It may therefore be necessary to prescribe the core publics as scientific communities, civil society and the policy apparatuses of government (CAISE, 2009)¹⁹.

The eminent innovation scholar, Mariana Mazzucato, has argued that “... even though the nature of missions requires that they be selected at the political level, the selection process must have a strong element of public involvement. This is both because innovation benefits from multiple and diverse influences, and also because without civic engagement, the risk of alienation from the broader public and a purely technocratic approach is too high. A mission will not inspire people unless they are part of it. A rigorous process of evaluation is needed to ensure continuing relevance and commitment and to prevent selection being captured by either passing fashion or vested interests” (2018: 21)²⁰.

Research councils also fulfil a custodial function with respect to the provision of public goods and services in the sciences which are often specified in their legislated mandates which ostensibly

¹⁸ CPEST. 2019. Many Approaches to Public Engagement, Center for Public Engagement with Science and Technology, American Association for the Advancement of Science, Washington DC.

¹⁹ CAISE. 2009. Many Experts, Many Audiences: Public Engagement with Science and Informal Science Education. A CAISE Inquiry Group Report,

²⁰ Mazzucato, Mariana. 2018 Mission-orientated Research & Innovation in the European Union- A Problem-solving Approach to Fuel Innovation-led Growth, European Commission, Brussels.

seek to promote and sustain scientific enquiry. It is incumbent upon them to also prescribe guiding principles and good practices to facilitate and encourage wider and deeper engagements with sciences. Processes of public engagement convened and coordinated by research councils should be sufficiently broad-based and not captured by specific corporate interests such that no ‘publics’ are excluded from processes. Each ‘public’ may require that the research council utilise specific strategies that best serve the needs and requirements of that ‘public’. Research councils constitute the main intermediary between the nexus of the sciences, policies, and the publics. Many research councils have already embraced thus far an increased focus on science education, science awareness, and science communication activities whilst also examining their explicit expectations for evaluation of public engagement during ex-ante evaluation processes of research projects. Research councils are, therefore, inextricably bound to facilitate public engagements as a means towards improving their performance as well as improving the functionality of their NSIs. Table 2 shows a logic model for public engagements with science as developed by the American Association for the Advancement of Science (2016)²¹:

Table 2. AAAS Logic Model for Public Engagement with Science

Inputs	Participants & Activities	Short-term Outcomes	Medium-term Outcomes	Long-term Outcomes	Vision
<ul style="list-style-type: none"> ▪ Research ▪ Evaluation ▪ Practitioners ▪ Leadership programmes ▪ Support to scientists ▪ Communication and engagement training ▪ Institutional support for scientists and publics ▪ Funding (incl. broader impact and other funding requirements) ▪ Strategy of communication 	<ul style="list-style-type: none"> ▪ Scientists ▪ Publics ▪ Practitioners ▪ Public dialogue approaches ▪ Policy deliberation approaches ▪ Knowledge co-production approaches ▪ University-led cooperative engagements approaches ▪ Everyday engagements 	Scientists humanized/ public individualized	Build trust between publics and scientists	Build trust between publics and scientists	<ul style="list-style-type: none"> Sound, evidence-informed public decision-making on science-related issues Dialogue on critical science-society issues embedded in public discourse Influence individual and collective action and behavior Influence policy Influence research agenda Research that is responsive to societal/ needs and interests Resilient STEAM workforce Science embedded in daily life
		Positive effect	Longer-term positive effect about science	Long-term positive effect	
		Increased sense of public engagement identity	Shared appreciation of public engagement Do more and better engagement (more able and comfortable) Build relationships to continue public engagement with science	Engagement is part of work and life (protocols, plans) in strategic and reflective ways Institutional change	
		Intention to act or engage again Increased skill/ ability to engage critically Increased self-efficiency	Act on something from engagement Be ready to advocate/ amplify Increased preparations to engage between science and society	Shared scientific or social content and understanding with networks	
		Increased interest and motivation around topic	Increased willingness to consider science-society intersections	Improve goals or focus of research Hear/understand others' views about science	

²¹ AAAS. 2016. Theory of Change for Public Engagement with Science, American Association for the Advancement of Science, Washington DC.

Inputs	Participants & Activities	Short-term Outcomes	Medium-term Outcomes	Long-term Outcomes	Vision
		Increased understanding of the process of science and social institutions	Increased ability to discuss science-society intersections	Frame science to be relevant to publics Framing knowledge outcomes for use by scientists and decision-makers	

Source: Adapted from AAAS, 2016.

As noted by PERFORM, “(e)ffective science communication to the academic community, the larger public and to policy makers has become an important aspect of research. While research institutions across the world demand greater output and impact, the support for achieving this goal is often left to individual researchers with little guidance, training and support” (2018)²². Research councils increasingly perform outcomes-based assessments which seek to measure the realisation of impacts arising from their investments in research and development. As depicted in Table 2, various inputs from the sciences are transformed through the activities of participants into outcomes that are stratified according to time. The AAAS’s logic model suggests that successful and meaningful public engagements improve that performance of NSIs through enabling increased participation, redressing systemic and institutional exclusion, and ensuring alignment with relevant and quality public knowledge goods and services. Such practices by research councils allows them to further entrench sciences in the daily lives of the various publics, enables the flow of information into the policy domain, and thereby effect an improved perception of the utility of sciences in society in general.

Concluding Considerations

Research councils remain essential components of the State. The State is the ultimate institution which formulates and effects policies through various structures of governance premised upon constitutionally defined principles of association. Research councils are accountable to the public at large through the mechanisms of the State and especially through the governments that are constituted with temporal mandates from the citizenry of the various national systems. Governments collect revenues from the societies they govern for the purposes of maintaining order and advancing socio-economic and political development of their citizens. It is these public resources that are entrusted to research councils for the purposes of advancing knowledge frontiers and addressing bio-physical and social challenges of the conjuncture.

Thus, whilst research councils are accountable to the State for the agency afforded to them, they are also accountable to the communities of scientists that they support in the advancement of knowledge and the derivation of applications which improve their material lives; and to various publics that are ultimately beneficiaries of the investments made on their behalf. Research councils are, therefore, in perpetual processes of performing boundary-spanning activities to ensure that they execute their multiple obligations efficiently and effectively while making sure that the needs of each constituency are met in a way that does not compromise that of other publics.

Public engagement is an increasingly explicit expectation demanded of research councils. Public engagement also allocates to research councils a key role in realising potential impacts of

²² PERFORM. 2018. Understanding Current Practices of Science Communication in Serbia and Albania: Recommendations for Enhancing Effectiveness, Swiss Agency for Development and Cooperation, Belgrade.

publicly funded research and in the outcomes resulting from scientific enquiries. By ensuring sufficient consultation and widening the dialogue to the various publics in the different regions and countries, public engagements with the sciences can also serve as mechanisms for legitimising scientific praxis and re-enabling the public's trust in sciences. As noted by Pham, "(e)ven though the societal impact of the science community's public engagement has been difficult to measure, available studies show a general positive correlation between high-quality community engagement and positive public attitudes towards science research" (2016)²³. As further acknowledged by Mazzucato, "(a)ll available and proven channels of communication with citizens should be explored so citizens can feel enthusiasm and trust in the process of change" (2018: 22)²⁴.

In responding to the challenges of the contemporary conjuncture, research councils can expect further demands on the performing science and technology agencies. By engaging with the public on, and with, science, research councils can also influence the course of human history, and encourage the building of resilience and sustainability of humanity on the planet. Realising such progressive ambitions requires that research councils are themselves properly resourced, capacitated, and competent in the deployment of public engagement approaches for the purposes of mutual learning and socio-economic and political development for all.

Questions for Regional Consultations and the Formulation of the GRC Statement of Principles for Public Engagement

1. What role, if any, should the GRC play as a public engagement actor?
2. What practices have GRC participating organisations adopted to enable, facilitate and support public engagements?
3. In the role of GRC participating organisations as intermediaries, do public engagements generate mutual learning for scientists and members of the public and society in general?
 - a. What lessons, if any, have resulted from public engagements for scientists?
 - b. What lessons, if any, have resulted from public engagements for members of the public?
 - c. What lessons, if any, have resulted from public engagements for the policy environment and governance regimes?
 - d. What lessons, if any, have resulted from public engagements for the public funding agency?
4. Do public engagements contribute to improving perceptions and levels of trust in scientific praxis?
5. What other impacts arise from public engagements, in the experience of GRC participating organisations?
6. What indicators could help research councils monitor, evaluate, and learn from public engagements?

²³ Pham, Daniel. 2016. Public Engagement is Key for the Future of Science Research, Nature 10.1038/npjscilearn.2016.10.

²⁴ Mazzucato, Mariana. 2018. Mission-orientated Research & Innovation in the European Union - A Problem-solving Approach to Fuel Innovation-led Growth, European Commission, Brussels.