

Effective research contributions towards sustainable development

Discussion paper for the 12th Annual Meeting of the Global Research Council in Interlaken, Switzerland hosted by the Swiss National Science Foundation (SNSF) and the Fonds ivoirien pour la Science, la Technologie et l'Innovation (FONSTI).

1 Executive summary

Research funding organisations have a responsibility to make research more sustainable and to contribute to the implementation of the 2030 Agenda. For the GRC 2024, views on the role and responsibilities of funders, as well as actions contributing to sustainable development will be discussed from three complementary perspectives: (a) research for sustainable development; (b) making research more sustainable; (c) making sure sustainability science matters.

Regarding “research for sustainable development”, this discussion paper focuses on concrete sustainability challenges with the aim of understanding underlying issues and supporting societal problem solving, societal change and transformation processes. Several specific requirements are associated with this kind of research: (i) consideration of the complex nature of sustainability questions; (ii) framing problems and research questions with relevant societal actors and stakeholders; (iii) consideration of ongoing societal debate and action taken upon the issue to decide on the adequate research question and form of research; and (iv) ensuring access to sustainability knowledge globally.

The topic “making research more sustainable” seeks to make research practices more economically, ecologically and socially responsible and reflects upon the possible structures and incentives that might do this. In this context, a “sustainable research institution” or “system” may be active in the following areas: (i) encouraging sustainable research practices; (ii) adoption of sustainable research assessment systems; (iii) developing sustainable research cultures; (iv) creating sustainable research ecosystems; and (v) contributing towards the United Nations Sustainable Development Goals (SDGs). These axes are inter-related; for example, prerequisite for a more sustainable research culture are more sustainable forms of research assessment, which in turn should encourage the abolition of unsustainable research practices and create space for more sustainable research environments.

The topic “making sure sustainability science matters” deals with the dialogue between research and society and looks for adequate structures to accelerate the uptake of scientific results by policy makers and society. Particular attention is paid to the following dimensions: (i) spaces for co-production and co-creation; (ii) principles to foster effective dialogue and trust between various stakeholders; (iii) individual skills and awareness; and (iv) systemic conditions to strengthen the science-policy interface. The aim is to discuss and to share existing show-case examples, learnings, principles, tools and best practices for these four dimensions in terms of collaboration methods, meetings spaces, ethical principles and financial models.

2 Introduction

The Global Research Council is a virtual organisation, comprised of the heads of science and engineering funding agencies from around the world, dedicated to promoting the sharing of data and best practices for high-quality collaboration among funding agencies worldwide.

The GRC meeting takes place annually and is hosted by two organisations from different continents. In between, Regional Meetings are held during the autumn in five regions to prepare inputs for the Annual Meeting.

The topics of the GRC meetings are chosen separately. Usually, two topics are selected and discussed during the GRC meetings. Traditionally each host takes over preparations and the lead on one of the two discussion topics.

A call is issued to all interested organisations to submit topics suggestions. The GRC Programme Committee considers and selects the topics. In the case of the 2024 GRC meeting, the SNSF and FONSTI decided to make a bid, with one overarching theme of “sustainable research”. This has been developed around three related topics:

- **Research for sustainable development** - strengthening the contribution of research to sustainable development
- **Making research itself sustainable** – making research itself an expression of economic, ecological and social responsibility
- **Making sure sustainability science matters** – supporting scientific knowledge’s benefits to policy makers and people

Having one overarching topic with three subtopics does not correspond to the traditions of the GRC. However, the Programme Committee and Governing Board of the GRC accepted the hosts’ request to organize the GRC 2024 around one main topic. They also made a request to take into consideration further topics such as open access, international cooperation, science communication and equality, diversity and inclusivity.

The GRC 2024 will take place in Interlaken in the Canton of Bern, Switzerland. The conference centre is the Congress Kursaal Interlaken, which offers a variety of large and small conference rooms that were built in different time periods. Information regarding the hosts can be found in the Annex (Chapter 7).

3 Research and sustainable development

Global crises such as extreme poverty, climate change, social inequalities and the degradation of ecosystems due to resource exploitation are among the greatest and most urgent societal challenges of our time. To address them, the United Nations have adopted the 2030 Agenda, a comprehensive framework to achieve 17 Sustainable Development Goals (SDGs) with the overarching goal of promoting human well-being in an equitable way that leaves no one behind while protecting the integrity of the Earth's natural systems¹. Science is explicitly asked to contribute to the implementation of the 2030 Agenda². Research funding organisations can support this not only through targeted funding of research for sustainable development, but also by making research as a whole and its funding more sustainable. For the GRC 2024, views on the role and responsibilities of funders, as well as actions contributing to sustainable development will be discussed from three complementary perspectives:

3.1 Research for sustainable development

To strengthen the contribution of research to sustainable development, research-funding organisations can stimulate, enable and support the development of diverse basic and use-oriented knowledge in support of sustainable development in and between all disciplines and in collaboration with (non-academic) stakeholders and/or practitioners.

3.2 Making research more sustainable

To contribute to sustainable development, research itself must be an expression of the combination of ecological, economic and social responsibility. Together with their strategic partners, national research-funding organisations can create driving structures and incentives for more sustainable research practices.

3.3 Making sure sustainability science matters

To support scientific knowledge benefits policy makers and society; this requires stimulation of more effective dialogue between research and society. How research results can be harnessed to answer society's pressing questions in the field of sustainable development needs to be considered. Reflections are required on how science can support the transformation towards a more sustainable society.

¹ UN (2015): Transforming our world: the 2030 Agenda for Sustainable Development. United Nations: New York.

² Independent Group of Scientists appointed by the Secretary-General (2019) Global Sustainable Development Report 2019: The Future is Now – Science for Achieving Sustainable Development. United Nations, New York.

Key terms:

- 1 **Sustainable development:** Sustainable development was defined by UN member states as development that allows all people to live a decent life and meet their essential needs without compromising earth' life support systems and the ability of future generations to meet their own needs. It thus sets clear limits and conditions for human activities on planet Earth. The core principles – integrity of natural systems, intergenerational and intragenerational equity – have to be equally strived for. The same applies to the 17 Sustainable Development Goals that build the core of the UN 2030 Agenda. Economic value creation or measures to protect the environment should thus not be at the cost of people's livelihoods. The 2030 Agenda is the current universal call to action on national and international levels to jointly solve major global challenges. The goals balance the economic, social and environmental dimensions of sustainable development. Recent discourses suggest to also develop inner capacity to live purposeful, sustainable, and productive lives – referred to as Inner Development Goals (individual sustainability).
- 2 **Society (inclusive):** Building the link between science and society involves having a broad perception of it. The dialogue between research and society must not only concern interactions between researchers and decision-makers or between researchers and companies. The process requires special attention to all components of society, as individuals or as groups living together and forming a community, regardless of the diversity of their interests."
- 3 **Inter-, multi- and transdisciplinarity:** Multi-disciplinarity involves a loose collaboration between researchers in disciplines, often where the disciplines and their approaches and methods are left intact. Interdisciplinarity involves a stronger collaboration commonly based around a given or a shared research question or goal. The disciplines needed in an interdisciplinary project are commonly defined by the question or goal and not the disciplines available themselves. Thus, interdisciplinary research is normally multidisciplinary, but multidisciplinary research is not necessarily interdisciplinary. Transdisciplinary research distinguishes itself by involving those whom the research is perceived as concerning in the practice of not only the research itself but also the framing as to what the question or goal of the research should be. Transdisciplinary research is commonly goal oriented, but the goals may only be established through the research process. It involves co-producing knowledge (which also encompasses co-designing research and co-creating options for action) in heterogeneous groups.
- 4 **Stakeholders/practitioners:** For research on societal needs and societal challenges, it is important to understand who can provide knowledge on the issue, who is affected by the problem, and who has the power to do act upon it⁶. These societal actors potentially need to be consulted or involved in processes of knowledge co-production. Since they are typically not working in academic contexts, they are referred to as practitioners, societal actors, or stakeholders. The terms are thereby not used consistently.
- 5 **Transformation:** For societies to become more sustainable, profound changes are needed. These changes in the way we meet our needs and provide goods and services concern everyone: they range from individual behaviour to companies' business models and politicians' decisions. Such profound or radical societal changes are referred to as societal transformation processes. They require radically different approaches and ways of thinking; and for example, to transform commodity industries into circular economic systems. Depending on the interpretation, transformations are systemic, structural, radical, revolutionary, or disruptive - old is destroyed, new is created (International Science Council 2021).

4 Research for sustainable development

4.1 Introduction

Research for sustainable development involves on the one hand studies of the meaning of sustainable development, be it observations of political discourses or the development of new ideas, concepts and proposals. On the other hand, it contributes to resolving specific challenges related to sustainable development. This discussion paper focuses on the latter: studies of concrete sustainability challenges with the aim of understanding underlying issues through basic research and supporting societal problem solving, societal change and transformation processes. Examples of concrete sustainability challenges are food insecurity, climate change, water scarcity, missing access to education, armed conflicts, or exploitative economic activities, just to name a few. Sustainability challenges are typically complex, associated with a multitude of sectors and actors, and interrelated with each other.

Several specific requirements are associated with research in support of the politically set societal vision of sustainable development:

4.1.1 *Considering the complex nature of sustainability questions*

In very general terms, research in support of sustainability transformations serves to improve our knowledge for re-orienting the way we meet our needs to the core sustainability principles agreed upon by the community of states under the UN. These principles were concretised into 17 Sustainable Development Goals, which build the core of the UN 2030 Agenda. Sustainability challenges relate to several of these interconnected goals that all need to be given equal importance. Solving these challenges therefore involves dealing with synergies and trade-offs between these different goals³.

4.1.2 *Framing problems and research questions with relevant societal actors and stakeholders*

To produce relevant basic and use-oriented research contributions, it is critical to develop research topics and questions that are aligned to focus upon the most urgent and important societal needs⁴. To this end, it is helpful to identify key sustainability questions and to find ways of prioritizing them. One increasingly discussed way to do this is through combining different disciplinary perspectives and by involving societal actors and stakeholders in a process referred to as joint problem framing, a term that was developed in transdisciplinary research⁵. If the aim is to address a societally relevant issue in its relevant aspects, people affected by the problem, people that have relevant knowledge and people or

³ Nilsson, M.; Chisholm, E. ; Griggs, D. et al. (2018): Mapping interactions between the sustainable development goals: lessons learned and ways forward. *Sustainability Science* 13, 1489–1503. <https://doi.org/10.1007/s11625-018-0604-z>

⁴ Independent Group of Scientists appointed by the Secretary-General (2019) *Global Sustainable Development Report 2019: The Future is Now – Science for Achieving Sustainable Development*. United Nations, New York.

⁵ Lang, D.J.; Wiek, A.; Bergmann, M.; Stauffacher, M.; Martens, P.; Moll, P.; Swilling, M.; Thomas, C. (2012): Transdisciplinary research in sustainability science: practice, principles, and challenges. *Sustainability Science* 7, 25–43. <https://doi.org/10.1007/s11625-011-0149-x>

actors that have an important interest or stake in the issue need to be consulted to develop an adequate problem understanding⁶.

Since sustainable development is an inherently normative concept, research in this context inevitably refers to a specific understanding or vision of sustainability. Due to the fact that the concept of sustainable development is defined only on an abstract level, a variety of interpretations in concrete contexts are equally legitimate. For this reason, research projects need to specify and make explicit to which specific normative goal they refer.

4.1.3 *Considering ongoing societal debate and action taken upon the issue to decide on the adequate research question and form of research*

In research for sustainable development, or societal challenges in general, it is also important to consider the state of public awareness of the problem, or more generally the state of societal problem solving. How well is the issue understood, is the problem already manifest or is it a threat that might affect us in the future? To what extent is it debated, how strongly is it contested, are there any measures or policies or other implementation actions planned or realised? Depending on the answers to these questions, different kinds of research might be needed to support the process. Basic research can help understanding systemic interrelations that are needed to develop possible scenarios for the future, whereas applied research could be more useful to identify concrete policy measures in a specific case and context. Interdisciplinary collaborations⁷ are required where a problem or question requires theories and approaches to transcend traditional disciplinary divisions if research is to capture a sustainability challenge more comprehensively. Transdisciplinary approaches support knowledge co-production among scientists and non-academic actors and stakeholders. They are particularly useful where it is important to balance diverging interests, to align the research work to the common good, to integrate non-academic expertise and to jointly develop knowledge and test options for action in pilot settings⁸.

4.1.4 *Ensuring access to sustainability knowledge globally*

Given the inequalities in achieving sustainability around the world, the challenges of sustainable development require fundamental commitments for the planet and for societies, the open science movement is proving to be an opportunity to strengthen the conduct of research work and to better contribute to the achievement of the Sustainable Development Goals (SDG).

Thus, there is the fundamental challenge of how to change the culture of doing research by providing more appropriate studies that link science and sustainable action so as to make them accessible. The costs of publication and reading charges are increasingly progressively leading to difficulties of access

⁶ Wuelser, G.; Pohl, C.; Hirsch Hadorn, G. (2012): Structuring complexity for tailoring research contributions to sustainable development: A framework. *Sustainability Science* 7(1), 81-93. <http://dx.doi.org/10.1007/s11625-011-0143-3>

⁷ GRC (2016): Statement of Principles on Interdisciplinarity. https://globalresearchcouncil.org/fileadmin//documents/GRC_Publications/Statement_of_Principles_on_Interdisciplinarity.pdf

⁸ Wuelser, G.; Pohl, C.; Hirsch Hadorn, G. (2012): Structuring complexity for tailoring research contributions to sustainable development: A framework. *Sustainability Science* 7(1), 81-93. <http://dx.doi.org/10.1007/s11625-011-0143-3>

to the open science facilities for some researchers worldwide. Open science should be supported to increase access to knowledge and experience sharing. This requires funders help to improve the accessibility of knowledge through open science (publication fees and consultation fees).

The management of science funding can help stimulate different ways of doing science. The commitment of institutions and partners for open science will therefore improve the sharing, appropriation and valorization of research results in decision-making, and thus to develop innovative, impactful and sustainable science, which contributes to the improvement of the living conditions of the populations. As an example, the GRC suggests to make all research financed with public money freely accessible and share the content as much as possible^{9 10}.

4.2 Best practices/interesting initiatives

4.2.1 *Interdisciplinary consortia*

Encourage systemic and integrative research in interdisciplinary consortia. The SHAPE-ID Toolkit provides understandings and best practice of doing and supporting interdisciplinary and transdisciplinary research (IDR/TDR) involving Arts, Humanities and Social Sciences (AHSS) disciplines alongside societal partners and researchers from the Sciences, Technology, Engineering and Mathematics (STEM) disciplines. It addresses policymakers, funders, research performing organisations, researchers and research partners. <https://www.shapeidtoolkit.eu/>

4.2.2 *Complexity of sustainability questions*

Call for identifying and managing key synergies and trade-offs between sustainability goals: The International Council for Science developed an approach to identifying key interrelations between the SDGs: A Guide to SDG Interactions: from Science to Implementation: <https://council.science/publications/a-guide-to-sdg-interactions-from-science-to-implementation/>

4.2.3 *Transdisciplinary approaches*

Orient research toward societal knowledge needs, for instance through defining research priority themes for research agendas (<https://sustainability.scnat.ch/en/id/MqFjx>), or through co-designing research questions with societal actors and adopting transdisciplinary and knowledge co-production approaches (Methods and tools for co-producing knowledge: <https://naturalsciences.ch/id/brZ74>). Best practice funding programmes for fostering knowledge co-production: LIRA 2030 in Africa <https://council.science/publications/lira-achievements/>); Profile area Societal Transformations of the Volkswagen Foundation (Germany) <https://www.volkswagenstiftung.de/en/funding/our-funding-portfolio/profile-area-societal-transformations>

⁹ GRC (2013): Action Plan towards Open Access to Publications. https://globalresearchcouncil.org/fileadmin/documents/GRC_Publications/grc_action_plan_open_access_FINAL.pdf

¹⁰ GRC (2023): Statement of Principles and Practices on Climate Change Research Funding. https://globalresearchcouncil.org/fileadmin//documents/GRC_Publications/SoP_Climate_Change_Research_Funding.pdf

4.2.4 Multilateral collaborations

Jointly identify key global sustainability challenges and launch research funding for collaboratively working on them, e.g. Collaborative Research Actions by the Belmont Forum (partnership of funding organizations, international science councils, and regional consortia committed to international trans-disciplinary research on understanding, mitigating, and adapting to global environmental change):

<https://www.belmontforum.org/cras>

Accelerate achievement of the SDGs by implementing results of ongoing or recently finalised research projects, e.g. SDG Call 2022 of the Global Research Council (GRC): <https://www.nrf.ac.za/sustainable-development-goals-sdgs-collaborative-funding-call/>

4.2.5 Build networks and partnerships for longer-term research engagement

Allow for long duration of research to build contacts, networks and partnerships (6-12 years). Time is needed to build partnerships and to ensure integrated work oriented towards implementation. Individual research projects could typically have three phases: 1) an exploratory problem framing, together with stakeholders, 2) the main research phase, 3) an application/implementation phase during which results would be widely disseminated and their impacts assessed. Examples of funding programmes: The r4d and SOR4D programmes of the Swiss Agency for Development and Cooperation and the Swiss National Science Foundation finances research partnerships between Switzerland and African, Asian and Latin American countries in order to provide policymakers with scientific and development-relevant knowledge: <https://www.r4d.ch/en> and <https://www.sor4d.ch/en>

Invest more in open science infrastructures and services Support to open science infrastructure provides the scientific and scholarly community worldwide with resources and services to access, share, and assess research. For example, SCOSS (Global Sustainability Coalition for Open Science Services) contribute to the establishment of an infrastructure of free and open access services and scientific services subsidized by a community of decision-makers, libraries and stakeholders [SCOSS.org].

4.2.6 Invest in training, education, digital literacy and capacity-building for open science

Investment in training, education, digital literacy and capacity-building, enable researchers and other stakeholders to participate in open science. Promote international and multistakeholder cooperation in the context of Open sciences with a view to reducing digital, technological and knowledge gaps.

4.2.7 Implementation of research

Support researchers in the implementation of research results. Funders expand their mission and engage more directly with researchers and research users to support the generation of actionable knowledge.

4.3 Discussion questions/points

What can we as funders do to ensure closer collaboration between science and societal actors/ stakeholders in the whole research process? What are the experiences with funding inter- and transdisciplinary research? How can closer collaboration of funders be encouraged in funding schemes to promote research on and for sustainability?

How can funders balance the (societal) impact orientation of research for sustainable development and basic science? Can the two be reconciled?

How can funders support the transfer of knowledge into implementation? What is the role of research in developing solutions and concrete options for acting upon a problem? How strongly should this be promoted by research funders?

How can research appropriately consider complex interrelations between sustainability goals?

What are the implications of more collaborative, use-oriented forms of research for sustainable development for research evaluation (proposal assessment)?

How can funders support open access publications and reduce the costs regarding the access to knowledge?

Many research questions on sustainable development require transdisciplinary co-creation. However, it can also be critical and non-inclusive to reduce it to such research. Basic research provides important fundamental system understanding. How can contributions of mono-disciplinary and basic research to sustainable development be recognized?

4.4 Further reading

Arnott, James C.; Kirchhoff, Christine J.; Meyer, Ryan M.; Meadow, Alison M.; Bednarek, Angela T. (2020): Sponsoring actionable science: what public science funders can do to advance sustainability and the social contract for science. *Current Opinion in Environmental Sustainability* 42, 38–44. <https://doi.org/10.1016/j.cosust.2020.01.006>

Global Sustainability Coalition for Open Science Services: <https://scoss.org/what-is-scoss/>

Global Research Council Statement of Principles on Climate Change Research Funding (2022): [SoP_Climate_Change_Research_Funding.pdf \(globalresearchcouncil.org\)](https://www.globalresearchcouncil.org/SoP_Climate_Change_Research_Funding.pdf)

International Science Council (2021): *Unleashing Science: Delivering Missions for Sustainability*, Paris, France. International Science Council. DOI: 10.24948/2021.04

International Science Council (2021): Three ways of understanding social transformations to sustainability. *Knowledge Briefs*. Volume 6, March 2021. <https://council.science/publications/three-ways-of-understanding-social-transformations-to-sustainability/>

Norström, A.V., Cvitanovic, C., Löf, M.F. et al. (2020): Principles for knowledge co-production in sustainability research. *Nature Sustainability* 3, 182–190. <https://doi.org/10.1038/s41893-019-0448-2>

Tseng, V.; Bednarek, A.; Faccè, K. (2022): How can funders promote the use of research? Three converging views on relational research. *Humanities Social Sciences Communication* 9(219).

<https://doi.org/10.1057/s41599-022-01157-w>

Funds for NGOs: <https://www2.fundsforngos.org/featured/how-to-ensure-sustainability/https://pro.inserm.fr/rubriques/recherche-responsable/science-ouverte/financement-de-lopen-access>

UNESCO Open Science Recommendation: <https://en.unesco.org/science-sustainable-future/open-science/recommendation>

Zaccaï, Edwin (2007): Développement durable et disciplines scientifiques. *Natures Sciences Sociétés* 15(4), 379-388.

5 Making research more sustainable

5.1 Introduction

The second topic is concerned with making research itself an expression of economic, ecological and social responsibility. Founded upon the principle that in the same way that research has a monetary cost, it can also have environmental and social costs. Thus, this topic seeks to make research practices more economically, ecologically¹¹ and socially responsible and reflects upon the possible structures and incentives that might do this. As funders of research, research councils can play a role in establishing more sustainable structures and incentives.

Making research more sustainable is not just about reducing the environmental footprint of research but also, and in addition, addressing the wider challenges of making research socially, economically and individually sustainable. With this in mind, we can imagine a “sustainable research institution” and “sustainable research system” that is proactive across five axes:

1. Encouraging sustainable research practices
2. Adopting sustainable research assessment systems
3. Developing sustainable research cultures
4. Creating sustainable research ecosystems
5. Contributing towards the United Nations Sustainable Development Goals (SDGs)

These axes are inter-related; for example, developing a more sustainable research culture will require more sustainable forms of research assessment which in turn should encourage more sustainable research practices and an end to ways of working that make our research environments unsustainable.

5.1.1 Definitions and explanations

Encouraging and promoting sustainable research practices

What we do as researchers and how we do it has impacts on the resources we consume and the waste that we produce. However, these impacts are not just environmental, but influence also individual well-being, quality of life, emotional standing, equal opportunities; and so, in turn, feedback into the ability to

¹¹ Global Research Council Statement of Principles on Climate Change Research Funding (2023): [SoP_Climate_Change_Research_Funding.pdf \(globalresearchcouncil.org\)](https://www.globalresearchcouncil.org/SoP_Climate_Change_Research_Funding.pdf)

be creative but responsible researchers. Initiatives that develop more sustainable research practices not only benefit our individual sustainability but also the wider quality of the work we do (e.g. replacing part of academic travel with online communication, repairing rather than replacing devices, developing gender balanced research teams).

Adopting sustainable research assessment systems

The way we assess research¹² has a direct impact upon the sustainability of the research that we do. Known as “Goodhart’s Law”¹³, it implies that any criterion used in evaluation becomes a goal for those subject to evaluation, and so loses its value as an independent criterion. For instance, counting publications encourages researchers to publish more; counting citations encourages researchers to find ways of being more highly cited. The environmental, economic and social costs of research activity scale with its volume. Thus, making research sustainable requires that volumetric measures need to be replaced wherever possible with measures that (1) evaluate quality and (2) are able to assess research that is done in different ways from the conventional model, such as transdisciplinary research. For instance, co-production is a model of doing research with those who are living with the problems that research is itself trying to address, the research subjects¹⁴. But central to co-production is the development of research questions and approaches with research subjects. How do current assessment approaches evaluate research where the questions and approaches that are to be used to answer them are not specified a priori? Evaluation systems and peer review need to evolve to create the time needed to evaluate quality and to develop new and innovative forms of assessing transdisciplinary research proposals. Such changes – including multi- and interdisciplinary research assessments, selecting peer-reviewers with prior experience in evaluating transdisciplinary research, evaluating the societal impact of research projects - will be the essence of more sustainable research evaluation¹⁵.

Developing sustainable research cultures

We do not work in isolation but in communities around which there develops a certain milieu. It is not just those who assess research who create that milieu, but the milieu itself. That is, the milieu is both an outcome of the day-to-day practices as researchers but also, through the experience of the milieu, the milieu is actively involved in its own changes. Both individually and collectively, this emphasises reflexivity in research, the process of evolving one’s own (or a community’s own) beliefs and practices, consciously and unconsciously, as a result of the act of doing research. Reflexivity is a classical attribute of being a strong researcher. However, this reflexivity and hence the research milieu is also shaped by external factors and not just how research evaluation is done. For instance, introducing a discussion about the environmental costs of travel, even without new regulations to manage it, may change how researchers prioritise travel in their research. Raising the challenges faced by those with caring responsibilities in attending institutional activities (workshops, social events) may grow awareness of those

¹² Global Research Council Call to Action on Responsible Research assessment (2021): [RRA Call to Action English.pdf \(globalresearchcouncil.org\)](#)

¹³ Goodhart, C. (1975): Problems of Monetary Management: The U.K. Experience. Papers in Monetary Economics, 1(1-20). Reproduced as Goodhart, C.A.E. (1984): Problems of Monetary Management: The UK Experience. Monetary Theory and Practice. Palgrave, London. https://doi.org/10.1007/978-1-349-17295-5_4

¹⁴ Lane, S. N.; Odoni, N.; Landström, C.; Whatmore, S. J.; Ward, N; Bradley, S. (2011): Doing flood risk science differently: an experiment in radical scientific method. Transactions of the Institute of British Geographers 36, 15–36

¹⁵ OECD (2020), Addressing societal challenges using transdisciplinary research, OECD Science, Technology and Industry Policy Papers, No. 88, OECD Publishing, Paris, <https://doi.org/10.1787/0ca0ca45-en>

challenges that can then be used to challenge other practices that are not socially sustainable. Developing a sustainable research culture then, is about identifying steering and developing those external factors that can evolve the milieu in ways that make being a researcher more sustainable in all dimensions of the concept.

Creating sustainable research ecosystems

Our research costs in terms of money; but also time, resources consumed, waste produced. These tie directly into the environments we work in and how we use them and so they impact the sustainability of our research ecosystems. Creating sustainable research ecosystems requires a greater understanding of the footprints of our research broadly defined, ecologically, socially, economically etc. and the adoption of specific actions that reduce those footprints. To date, sustainability assessment has hardly appeared in research evaluation or wider cultural practices in universities, as compared with ethical assessments around working with animals or working with people¹⁶. Such assessment is needed to introduce replace, reduce, refine practices in relation to making research more sustainable, as it has been adopted in other areas of research (e.g. animal experiments). COMETS¹⁷ argues that environmental impacts of research should be treated as part of research ethics, in the same way as animal testing or respectful interaction with human beings.

Contributing towards the United Nations' Sustainable Development Goals (SDGs)

Universities and research institutions may play a role in contributing to the United Nations' Sustainable Development Goals. But to do this requires that they have a clear knowledge of what the SDGs are and what they mean for research both as it is practiced but also for the kinds of research questions that are encouraged. This encouragement is an important step in aligning the research conducted in our institutions to the SDGs. It implies assessment of how much institutes are contributing to them (individually or collectively). It also implies influencing the choices we make about what research we do, so that institutes can do more to contribute to the SDGs.

5.2 Best practices/interesting initiatives:

5.2.1 Encouraging and promoting more sustainable research practices

- Slow Science – focus on quality over quantity, on being scientific (<http://slow-science.org/>) – avoiding the “fast science” that reinforces the Matthews effect and tends to reinforce gender and racial inequalities^{18 19}.
- Share science - sharing data, methods, codes, protocols which mean that others don't have to duplicate what has already been done.

¹⁶ Global Research Council Statement of Principles and Practices for Research Ethics, Integrity, and Culture in the Context of Rapid-Results Research (2022): [SoP_Research_Ethics_May_2022.pdf \(globalresearchcouncil.org\)](https://www.globalresearchcouncil.org/SoP_Research_Ethics_May_2022.pdf)

¹⁷ COMETS (2022) Integrating environmental issues into research practices. Opinion paper (n°2022-43), approved on 5 December 2022. <https://comite-ethique.cnrs.fr/en/comets-opinion-integrating-environmental-issues-into-the-conduct-of-research-an-ethical-responsibility/>

¹⁸ Lane, S.N. (2017): Slow science, the geographical expedition, and Critical Physical Geography. *The Canadian Geographer / Le Géographe canadien* 61, 84-101. <https://doi.org/10.1111/cag.12329>

¹⁹ Leite, L.; Diele-Viegas, L.M. (2021): Juggling slow and fast science. *Nature Human Behaviour* 5(409). <https://doi.org/10.1038/s41562-021-01080-1>

- Encourage international cooperation through improved connectivity between partners²⁰, leading to more opportunities for discussions that profit from 21st century telecommunications ...
- ... but also reflecting upon the extent of dependence of cooperation upon physical mobility given its often significant environmental, social and economic costs.
- Create intellectual times and spaces that avoid the fragmentation of research practices (sustained periods of time where you can work on one project in one place) and make sure that such times and spaces are properly funded and supported.
- Introduce sustainable limits on admissible publication costs (e.g. blacklisting journals with OA policies with Author Processing Charges higher than those required for publication).
- Broaden the range of who is perceived of benefiting from research (e.g. remove the ideological constraint that requires research to have an economic benefit) and recognise that realising impact can take time.

5.2.2 Adopting more sustainable research evaluation

- Adopt the San Francisco Declaration on Research Assessment (DoRA) and evaluate quality rather than measure quantity
- Eliminate use of performance indicators and metrics in research evaluation, not least because they risk reverse engineering or manipulation (Goodhart's Law), but also because they tend to encourage counting and quantity which merits certain kinds of researchers (those with more time or resources to produce large numbers of publications)
- Broaden accepted research outputs to include outcomes besides publications
- Develop ways of presenting research achievements that focus less on quantity (e.g. the length of a CV) and more on content (e.g. narratives and supporting evidence)
- Accept that evaluating research takes time and speeding things up risks fraudulent practices, incorrect results, or under-developed results making it through the system
- Only allow evaluation (e.g. peer review at journals) to be undertaken by peers (defined as those conducting research in the field to which the work being evaluated pertains)

5.2.3 Developing more sustainable research cultures

- Adopt the principles established in initiatives like Better Science (<https://betterscience.ch/en/#/>)
- Initiate dialogue and discussion that can stimulate reflection on making research cultures more sustainable which in turn enables the reflexivity in research that evolves cultural practices
- Promote secure careers – security does not breed complacency but it can breed imagination, creativity and risk taking – and intervene early to reduce the risks of precarity (e.g. supporting career development to a particular goal within a research project rather than when the project has ended; diversify the support for careers besides academic ones)
- Diversify how we evaluate careers to reflect more sustainable research evaluation
- Reflect upon competition – as research resources (however defined) are finite there will be competition – it does not make sense to see equality in resources as a realistic goal – but a more balanced distribution of resources may result in much more valued and sustainable research outcomes

²⁰ Globa Research Council Statement of Principles for Capacity Building and Connectivity Among Granting Agencies Worldwide (2017): [Statement of Principles for Capacity Building and Connectivity Among Granting Agencies Worldwide.pdf](https://www.globalresearchcouncil.org/Statement_of_Principles_for_Capacity_Building_and_Connectivity_Among_Granting_Agencies_Worldwide.pdf) ([globalresearchcouncil.org](https://www.globalresearchcouncil.org))

- Develop an “Athena Swann”²¹ type charter for sustainability and make access to research funds conditional upon this charter

5.2.4 Creating more sustainable research environments

- Develop sustainable travel policies such as “Go TOP” - Train > Online > Plane – wider dimension of sustainability recognizes importance of personal interactions; emotions that cannot be diffused on-line; on-line fatigue. So go train. But online meetings can be (but are not inevitably) more sustainable from a personal perspective (e.g. widening opportunities to participate to those with other responsibilities; who are unable to avoid travel); so they should be always available. Plane should be a last resort but sometimes can’t be avoided. Support going TOP by flexible policies that encourage and empower working within overall limits.
- Make a sustainability assessment an element of obtaining approval to do research, as it already is when working with animals or working with people. Link this to the notion of replace > reduce > refine to eliminate the most unsustainable research practices
- Develop the regulatory framework for more sustainable research environments by implementing practices that minimize waste production, food and water miles, energy consumption

5.2.5 Contributing towards the United Nations’ Sustainable Development Goals (SDGs)

- Undertake an institutional audit of how research funders are supporting the SDGs and encourage universities and research institutes to do the same. Make this visible to others to raise the profile of the SDGs.
- Identify the kinds of research questions that align strongly with the SDGs and consider targeted initiatives to support them financially.
- Emphasising 4.2.2, make sure that the evaluation frameworks adopted encourage rather than discourage SDG-related research

5.3 Discussion questions/points

What examples are there of research funders encouraging more sustainable research practices (e.g. DORA, Open Science, Publication Practices). Are there examples of where these have worked well? Are there areas where they have failed? What challenges have arisen where more sustainable research practices have been tried out?

To what extent do research funders reflect on whether their research evaluation systems support sustainable research practices? How can research assessment systems evaluate interdisciplinarity and transdisciplinarity appropriately? How can research funders develop evaluation systems that are sensitive to the lessons of Goodhart's Law and so, through changing evaluation systems, change the fundamental practices that can make research unsustainable? Are there any examples of where this is being done? Have they worked and if not, why? What are the obstacles in evaluation systems? To what extent should research funders be actively encouraging change to achieve more sustainable research in research ecosystems more widely? Does doing this challenge the autonomy of universities and research institutes? Is it envisionable to develop an “Athena Swann” charter for sustainability? Should holding such a charter be a condition for receiving research funding?

²¹ <https://www.advance-he.ac.uk/equality-charters/athena-swan-charter>

Should research councils require a sustainability impact assessment (SIA) to be completed for all research? For some types of research? How easy would it be to introduce SIAs? Would they make any difference? What would they have to look like to make a difference?

To what extent are you aware of SDG-aligned research being supported by your organisation? Is there any routine collection of data on SDG-aligned research? Are there examples of specific SDG-aligned research calls? What worked well in these calls? What challenges did they pose for evaluation?

What could individual responsibilities be in contributing toward sustainable development within research institutions and the research they conduct? Do research funders have a role in encouraging such individual responsibilities?

5.4 Further reading

Better Science Initiative <https://betterscience.ch/en/#/>

Horgan, John (2011): The "Slow Science" Movement Must Be Crushed! Scientific American. <https://blogs.scientificamerican.com/cross-check/the-slow-science-movement-must-be-crushed>

Charles Sturt University (2019): Research Sustainability Guidelines. https://cdn.csu.edu.au/data/assets/pdf_file/0009/3185514/Sustainable-Research-Guidelines.pdf

Slow Science Academy <http://slow-science.org/>

San Francisco Declaration on Research Assessment DORA <https://sfdora.org/read/>

Stengers, I. (2013): Une autre science est possible (translated into English, 2017, Another Science is Possible)

6 Making sure sustainability science matters

6.1 Introduction

Making the most of research results for policy makers and society requires specific efforts and structures. The stakes and challenges are especially high when it comes to the application of sustainability science, because of the urgency of the questions, which threaten our habitat, our social fabric and survival; but also because the application of results often requires changes to the social fabric and established economic systems, which can be perceived as threatening and also raise fundamental questions of values and identity.

In this context, researchers are societal actors among others. They share hopes and fears and are acutely aware that sustainable transformation is only possible through joint action. Climate science is a striking example: scientists have established what is at stake and what could be done, yet action is slow, and the relevance and reliability of scientific results remain contested by a minority of researchers.

Success factors to widen and to accelerate the uptake of scientific results include:

1. Spaces for co-production or co-creation,
2. Principles to foster effective dialogue and trust between various stakeholders,
3. Individual skills and awareness,
4. Systemic conditions to strengthen the science-policy interface.

Effective approaches are context dependent and multi-layered, involving a variety of actors. Systemic conditions are required to support individual factors²² and cultural change. Therefore, learning from experience is key. By show-casing best practice and high-lighting joint challenges, the GRC aims to contribute to this learning process.

6.1.1 Supporting co-production or co-creation for effective valorisation of research results

The process of connecting science to society and the adoption of knowledge from research institutions requires, as a prerequisite, that research be more responsive to society's expectations²³. It is also essential to ensure the accessibility and simplification of research results. Practicability in day-to-day processes is key. In close interaction with research activities, actions must be directed towards the provision and implementation of the results of sustainability science. Chapter 4 highlights joint problem framing as a promising process to bring together researchers and societal actors to address a problem. Participatory research is another way to bring the citizen closer and increase familiarity with the results of scientific research. Co-funding models are also required, since sustainability research ultimately benefits all sectors of society, and costs can be high. Different criteria and timeframes for investment for public private actors pose a challenge.

The GRC aims to show-case examples of successful co-creation of sustainability research, to highlight, for example, collaboration methods, meeting spaces and financing models.

6.1.2 Principles to foster effective dialogue and trust

Stimulating an effective dialogue between research and society is a great challenge. There is intensive debate among researchers as to whether or not as researchers within society they should have the responsibility to take more normative stances. Some argue this weakens science as it makes science more political and less neutral; others argue that the whole concept of value free science is an illusion. In any case, clarity and transparency about roles is key to foster trust - a key pillar for successful science and society interactions^{24 25 26}. Trust is also fostered when there are joint goals, and therefore supported by co-creation. This implies that researchers must be attentive to society's expectations so that their work is perceived as a means of finding sustainable solutions to socio-economic and environmental challenges. Effective communication will be committed, pedagogical and humble, and give the citizen a voice.

²² Oliver, K.; Cairney, P. (2019): The dos and don'ts of influencing policy: a systematic review of advice to academics. *Palgrave Communications* 5(21).

²³ GRC (2020/21): Statement of Principles on Public Engagement. https://globalresearchcouncil.org/fileadmin/documents/GRC_Publications/SoP_Public_Engagement_English.pdf

²⁴ Cairney, P.; Wellstead, A. (2021): COVID-19: effective policymaking depends on trust in experts, politicians, and the public. *Policy Design and Practice* 4(1), 1-14. <https://doi.org/10.1080/25741292.2020.1837466>

²⁵ Gluckman, P. D. (2014): Policy: the art of science advice to government. *Nature* 507(7491), 163-165.

²⁶ Taddese, A. (2021): Meeting Policymakers Where They Are: Evidence-to-Policy and Practice Partnership Models. Background paper as input for the Center for Global Development's Working Group on New Evidence Tools (NET) for Policy Impact.

GRC-participants will discuss principles and tools susceptible to foster trust and mutual understanding.

6.1.3 Training and awareness building of all parties

Research-policy interactions are demanding for all parties involved: researchers, policy actors and citizens. Training and awareness-raising for all parties are therefore considered an important ingredient, to increase awareness of roles and foster specific skills (for example how to shape co-creation processes, communicate uncertainty or approach value-based issues). Various authors provide overviews of guidelines for researchers regarding communication^{27 28}. More recently ethical issues in science-society interactions have received greater attention and guidelines are in development^{29 30} to enable and protect both societal actors and researchers.

The GRC will be the opportunity to review best practices and to identify gaps with respect to training opportunities, guidelines and incentives.

6.1.4 Systemic conditions to strengthen the science-policy interface

Systemic conditions are required across research systems to support the development and dissemination of ethical principles and to ensure that the development of individual skills is appropriately incentivised and rewarded. To jointly define the principles for their collaboration, stakeholder require platforms for long-term collaboration.

These questions also lead us to reflect on the awareness of academic and research institutions of their responsibility towards society. The latter would not understand the relevance of "research" as long as it does not feel its interest and effects. It is in this regard that UNESCO³¹ argues that the necessary interfaces between science, policy and society must be developed to advance knowledge and action on sustainability, strengthen adaptive management and understanding of societies, and nurture the scientific basis for policymaking, decision-making and civil society action.

There is consensus that platforms for continuous and recurring interaction are key, as they foster mutual understanding and trust. Exchanges should include a broad range of actors, to capture a breath of perspectives and to include the many stakeholders that contribute to policy outcome: policy makers, NGOs, companies, customers, and civil society as a whole. New stakeholder groups may emerge, for example innovators/inventors outside the academic community. There is no "one-size-fits-all" solution. Different countries have put into place different structures and intermediaries to facilitate interactions between researchers, policy actors and societal players – scientific advisors at the executive or legislative levels, exchange programmes between researchers and policy actors and various platforms for exchanges at the many levels at which policy is done.

²⁷ Oliver, K.; Cairney, P. (2019): The dos and don'ts of influencing policy: a systematic review of advice to academics. *Palgrave Communications* 5(21).

²⁸ van der Bles, A. M.; van der Linden, S.; Freeman, A. L. J.; Spiegelhalter, D. J. (2020): The effects of communicating uncertainty on public trust in facts and numbers. *Proceedings of the National Academy of Sciences* 117(14), 7672–7683. <https://doi.org/10.1073/pnas.1913678117>

²⁹ Giannelos, K.; Reber, B.; Doorn, N. (2021): Ethics Framework 0.1 and Guidelines. ProEthics.

³⁰ Science Europe (2022): Report of the 2022 High Level Workshop on ERA: Research Ethics and Integrity in the Context of Public Engagement. <https://scienceeurope.org/our-resources/2022-high-level-workshop-report/>

³¹ UNESCO (2017): Guidelines on Sustainability Science in Research and Education. Guidelines on sustainability science in research and education - UNESCO Digital Library

The GRC will share experiences and discuss learnings from different models to strengthen the science-policy interface.

6.2 Best practices/interesting initiatives

- [CAPE \(Capabilities in Academic Policy Engagement\)](#), UK: “A knowledge exchange and research project that explores how to support effective and sustained engagement between academics and policy professionals across the higher education sector.” “CAPE is a partnership between UCL and the universities of Cambridge, Manchester, Northumbria and Nottingham, in collaboration with the Government Office for Science, the Parliamentary Office for Science & Technology, Nesta, and the Transforming Evidence Hub. CAPE is funded by Research England.”
- [South Africa Centre for Evidence](#), South Africa: “dedicated to supporting the use of evidence to reduce poverty and inequality in Africa”
- [Pairing scheme entre science et politique](#), Luxembourg: aims to connect members of parliament and researchers and to share scientific data for the better understanding of complex subjects.
- [ProEthics](#) is working with research and innovation funding organisations across Europe to test new, ethical ways to involve citizens in decision making processes. The EU funded project aims to develop, test, and promote a comprehensive ethics framework for the benefit of more relevant, fair and effective innovation activities. [The project has delivered an Ethics Framework 0.1 and Guidelines](#).

6.3 Discussion points

- Where do you see the key success factors for effective co-creation of sustainability research?
- Are there promising models for building trust and mutual understanding between researchers, policy makers and societal actors? What are the bottlenecks and what can we learn from them?
- What are participant’s stances on the question of neutrality of science versus normative engagement for change? In which contexts is neutrality particularly important? To what extent is it realistic? How can researchers navigate the tension between scientific independence and neutrality and normative engagement?
- Are there promising examples of enduring research-practice communities, or similar interfaces between scientists, practitioners, and decision makers? What can we learn from them? How to include members of society in the dialogue between researchers and policy actors? What ethical considerations need to be made when involving non-academic stakeholders?
- Which key skills do researchers, policy makers and societal actors need in order to jointly define and address issues of sustainability? What are the specific requirements in the case of politically controversial or value-laden issues and which additional tensions arise with respect to scholar-activism?

6.4 Further reading

Gluckman, P. D.; Bardsley, A.; Kaiser, M. (2021): Brokerage at the science–policy interface: from conceptual framework to practical guidance. *Humanities and Social Sciences Communications* 8(1), 1-10.

Mair, D.; Smillie, L.; La Placa, G.; Schwendinger, F.; Raykovska, M.; Pásztor, Z. (2019): Understanding our political nature: How to put knowledge and reason at the heart of political decision-making. Luxembourg: Publications Office of the European Union. JRC117161. <https://doi.org/10.2760/374191>

Norström, A. V.; Cvitanovic, C.; Löf, M. F. et al. (2020): Principles for knowledge co-production in sustainability research. *Nature sustainability* 3(3), 182-190.

Stewart, R.; Dayal, H.; Langer, L.; van Rooyen, C. (2019): The evidence ecosystem in South Africa: growing resilience and institutionalisation of evidence use. *Palgrave Communications* 5(1), 1-12.

7 Annex

7.1 Hosts

Swiss National Science Foundation (SNSF)

Based on a government mandate, the Swiss National Science Foundation (SNSF) supports scientific research in all academic disciplines – from physics to medicine to sociology and literature. At the end of 2020, the SNSF was funding more than 6000 projects involving 20,000 researchers, which makes it the leading Swiss institution for promoting scientific research. To ensure its independence, the SNSF was established as a private foundation in 1952. Its core task is identifying excellent scientific research ideas that merit financial support and making sure that there is sufficient investment in young researchers to meet Switzerland's future research needs. In 2022, it awarded CHF 910 million to the most promising project proposals. By allocating public research money based on the principle of competition, the SNSF contributes to the high quality of research in Switzerland. In close collaboration with higher education institutions and other partners, the SNSF strives to create optimal conditions for the development and international integration of Swiss research. It pays particular attention to the promotion of young researchers. In addition, it accepts evaluation mandates in order to ensure that large research initiatives funded by third parties deliver the highest scientific quality.

Website: www.snsf.ch

Fonds pour la Science, la Technologie et l'Innovation of Côte d'Ivoire (FONSTI)

Created in June 2018, The Fonds pour la Science, la Technologie et l'Innovation (FONSTI), is a research support fund designed to finance, through a competitive selection, high quality scientific research and technological innovation programmes and projects likely to have a beneficial impact on the socio-economic and cultural development of Côte d'Ivoire. Placed under the supervision of the Ministry of Higher Education and Scientific Research, FONSTI supports collaborations between public research communities as well as public-private partnerships in order to stimulate knowledge production in Côte d'Ivoire. Composed of 10 scientific fields, the FONSTI targets innovators, researchers and lecturers as well as start-ups. It pays particular attention to the participation of female researchers and young researchers, the promotion of entrepreneurship in teaching and research institutions.

Website: www.fonsti.org