Revising the Field of Research (FoR) codes to enable more integrative, inter and transdisciplinary science

Submission by SDSN Australia, New Zealand & Pacific to the ANZSRC Review, June 2019

Overview and key recommendations

The Sustainable Development Solutions Network (SDSN) Australia, New Zealand and Pacific focusses on strengthening and accelerating action by the university sector towards achieving the United Nations Sustainable Development Goals (SDGs).

The SDGs reflect some of the biggest challenges facing humanity today. They involve exceedingly complex and interconnected human-natural systems, contain elements of uncertainty, and involve multiple actors, perspectives and values, all of which means resultant research is artificially constrained by old disciplinary boundaries.

For this reason, this submission, made by the Secretariat of SDSN Australia, New Zealand and Pacific, particularly addresses the following question posed in *ANZRC Review 2019 Discussion Paper*:

> *10. How can the FoR codes better capture interdisciplinary/multidisciplinary research, and at what level (e.g. Field, Group, Division)?*

Properly addressing this question touches on all other questions in the discussion paper relating to the FoR codes.

The submission makes the following key recommendations:

- There needs to be a separate track for “Integrative Science”, which includes a 2-digit Integrative Science code.
- There is need for further and more focussed consultation with the Integrative Science community on the best way to structure this code and the sub-codes that come under it.
- Recognition for “Integrative Science” in Division 97, “Expanding Knowledge”, of the SEO codes.

The need for integrative, inter and transdisciplinary research

The biggest challenges facing humanity today, such as those encapsulated by the United Nations Sustainable Development Goals (SDGs), involve exceedingly complex and interconnected human-natural systems, contain elements of uncertainty, and involve multiple actors, perspectives and values, all of which means resultant research is artificially constrained by old disciplinary boundaries.

Research that spans conventional academic boundaries has an essential role in supporting society to address these challenges. While traditional disciplinary research has a very important role in understanding different components of these challenges and in helping to develop technologies to address them, newer integrative, inter and transdisciplinary research approaches are critical for understanding and managing the complexity of these challenges and developing solutions that will work in the real world (see references).

Furthermore, such research brings multiple benefits to academia: It pushes disciplinary knowledge into new conversations and frontiers, stimulating innovative new knowledge such as that underpinning big data and the Fourth Industrial Revolution. It helps academia produce more impactful, socially relevant research by

focusing academics on industry partners and communities and their problems. If academics do not have to translate and rework applied research into disciplinary boxes, they can more genuinely and productively engage with stakeholders. And finally, it better reflects the systemic nature of the world, leading to more accurate, higher quality insights and more effective applications.

Globally, attention is now firmly focused on these types of research. However Australia is lagging behind in recognising their growing significance and integrating them the Australian research system, which is consequently at risk of being rendered anachronistic and inhibitive of innovation.

The problem with the current FoR code system

The existing FoR codes encourage disciplinary science by assigning research projects to specific academic disciplines for the purposes of peer review selection and evaluation. However, this process disguises and impedes research that attempts to integrate across several disciplines by forcing the research into specific areas that do not capture its value, uniqueness and diverse goals, processes, and agendas.

The current system disadvantages integrative, inter and transdisciplinary research in two main ways:

- It leads to the assignment of proposal reviewers who are disciplinary experts rather than experts in the application of integrative, inter and transdisciplinary methods, and who thus fail to comprehend the value of the research they are assessing.
- Integrative, inter and transdisciplinary research is currently invisible for the purposes of ERA and institutional reporting. It is thus impossible to tell whether there is growth in the extent and quality of this important type of research, and it is less likely to receive specialised funding streams. This is particularly problematic with the growing focus on measuring and showcasing the societal impact of research, which these types of research approaches are especially crucial for. By discouraging and rendering impactful research invisible, the outdated FoR framework disadvantages the whole Australian research system.

Proposal for an Integrative Science FoR track

To address the problems with the current FoR code structure in relation to integrative, inter and transdisciplinary research, we propose a two-track process for FoR codes. Track 1 would be the existing disciplinary process. Track 2 would be a new “Integrative Science” process.

Integrative Science would include approaches that:

- Attempt true integration and synthesis across multiple disciplines and approaches to research
- Study systems that span across multiple human and natural spheres, and the interactions and interdependencies between them
- Do not fit into existing individual disciplinary FOR codes
- Are flexible and evolving
- Allow research that is co-produced with stakeholders.
- Incorporate indigenous knowledge

When entering FoR codes, researchers will be asked to choose one of these tracks. If they choose the Integrative Science track, they will have the option of either

1. Choosing from a limited number of pre-established Integrative Science fields, such as Sustainability Science, Innovation Studies, Ecological Economics, Development Studies (which is focussed on developing countries and communities), Ecological Design, Environmental Humanities, Systems Science, Translational Medicine, Human Ecology, Integrated Data Analytics, and Neurorobotics.
2. Choosing from a listing of the disciplinary FoR codes that are integrated in the specific research under the general heading of New Integrative Science.

Reviewers for Integrative Science research would be drawn from peers who identify as Integrative Science researchers, not from peers who identify as disciplinary specialists.

Integrative Science in the SEO codes

In a similar way to the FoR codes, the current structure of the Socio-Economic Objective (SEO) codes also significantly disadvantages integrative and interdisciplinary research. All the 6-digit options for Division 97, “Expanding Knowledge”, specify a single field (e.g., “Expanding Knowledge in the Mathematical Sciences”), forcing researchers back into disciplinary silos, and not providing recognition for research that integrate across areas of knowledge. There is therefore a need for “Integrative Science” to be given recognition through at least a 4 or 6 digit category in that division.

Recommendation for next steps

Because Integrative Science can touch on a very wide range of FoR disciplines, including directly on most 2-digit codes from 03 to 18, and a wide range of approaches, a centrally-run process to refine this proposal is needed. We therefore recommend approval by the ANZSRC Review parties of the general concept outlined above, followed by a series of workshops with Integrative Science researchers and the parties to work out the details.

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About SDSN Australia, New Zealand & Pacific

The Sustainable Development Solutions Network (SDSN) is a global network of universities and knowledge institutions that mobilises scientific and technical expertise to promote practical problem solving for sustainable development, including the implementation of the Sustainable Development Goals (SDGs). SDSN has been operating since 2012 under the auspices of the UN Secretary-General, and has over 900 member institutions around the world.

The SDSN regional network for Australia, New Zealand & Pacific was established in 2013 and is hosted by Monash University. It works with over 30 SDSN member institutions in the region around a number of SDG-related areas. One particular area of focus is the critical role of universities in helping society achieve the United Nations Sustainable Development Goals (SDGs) through their research, teaching, operations and community leadership, and how action by the university sector on the SDGs can be strengthened and accelerated.

In April 2019 the network organised a discussion with academics in SDSN member universities to discuss how the FoR can better reflect and support the kinds of research that is needed to help address the SDGs. The proposal in this submission reflects the outcomes of this discussion.

In addition, the submission draws on a number of other related activities undertaken by the network in the past two years, in particular:

- In 2017 the network developed and published *Getting started with the SDGs in universities: A guide for universities, higher education institutions, and the academic sector.* The guide explains how universities contribute to the SDGs through research and other activities, and discusses the barriers and enablers to accelerating this contribution. The guide has been translated into a number of languages and is now being used by universities all around the world. http://ap-unsdsn.org/regional-initiatives/universities-sdgs/university-sdg-guide/

- In late 2017 the network organised a consultation workshop with the university sector towards Australia's Voluntary National Review on the SDGs. The workshop resulted in a statement summarising how the Australian university sector is engaging with and contributing to SDG implementation in Australia, as well as the potential and requirements for the sector to do more. http://ap-unsdsn.org/wp-content/uploads/2018/03/University-VNR-Statement_Final.pdf

- In 2018 the network organised a joint symposium with the Australian Academy of Science/Future Earth Australia on "Integration across the SDGs and the role of research". The symposium looked at how research can help other stakeholders address complex interactions between the goals. http://ap-unsdsn.org/event-integration-across-the-sdgs-and-the-role-of-research/

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