

Chapter 1

Advancing Sustainability Research in the 21st Century

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ABSTRACT

Major developments have been achieved in advancing sustainability research in sustainability science (SS) as a new and distinct field. Based on its emerging academic landscape, SS has now acquired an unusual geographic footprint with a giant cluster of co-authorships in cities and countries at very different levels, all in pursuit of sustainable development and sustainability. It has gained a robust inclusion in the agendas of governments and corporations along with the burgeoning growth of educational and research programs worldwide. In the call for the integration of research and education, higher educational and research institutions have fostered the goals toward sustainability to address the practical protection of Earth's key support systems, climate change, and other global issues. In confronting a wide range of global issues in the 21st century, scientists across the globe see the need for accelerating knowledge in sustainability wherein knowledge production itself must be made sustainable.

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OVERVIEW

This introductory Chapter provides a quick look at significant advancements in Sustainability Science (SS) as a new, inclusive, distinct field (Bettencourt and Kaur, 2011) that has sharply demonstrated productivity and potentially powerful impacts based on its remarkable growth in research, education and policy development. There are key milestones that deserved to be mentioned. Based on the report from the Proceedings of the National Academy of Sciences (PNAS), sustainability science has grown explosively since the late 1980s showing huge levels of scholarly collaboration and networking in research and education. In particular, the PNAS initiative has given SS an enviable position as a vibrant field of research and innovation with a ‘room of its own’ considering that it has developed a core research agenda as defined by the problems it addresses rather than by the disciplines engaged in intellectual inquiry as shown by the mounting flow of research results (NAS, 2007).

In this Chapter, the notable advancements in the global educational landscape of SS is termed here as ‘sustainable knowledge capital’ as a way to recognize the academic and societal contributions through sustainability research, education and knowledge production. In the past three decades, SS has also increasingly shown its pervasive and robust inclusion in the agendas of governments and corporations apart from the burgeoning growth of educational and research programs worldwide (Bettencourt & Kaur, 2011). In research and practice, the birth of SS has inspired researchers and scientists, stakeholders and practitioners across the globe to explore the application of theories, techniques and methods; find solutions to complex issues facing humanity and increase the Earth’s capacity in dealing with human nature changes and challenges for tomorrow, today. At Harvard University Centre for International Development (CID), the goals of SS have been defined as one that advances the ‘basic understanding of the dynamics of human-environment systems, to facilitate the design, implementation, and evaluation of practical interventions that promote sustainability in particular places and contexts; and to improve linkages between relevant research and innovation communities on the one hand, and relevant policy and management communities on the other (CID 2010; Frodeman, 2011).

Obtaining impetus from the progress in the academic landscape and societal interest, Sustainability Science has emerged in academia as a new science that examines the human-environment interactions and interconnections, socio-economic and environmental changes and complex challenges, and their impacts on the future of planetary life support systems over the last few decades (Shahadu, 2016). Since the 1980s, the academic literature has produced foundational publications such as *Our Common Future*, also known as the Brundtland Report by the United Nations’ sponsored World Commission on Environment and Development (WCED, 1987). This report included the ‘canonical definition’ of sustainable development concerning

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