

## 36. An I2S Discipline: Legitimate, viable, useful?

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I have a research background in the dynamics of resource use at a variety of scales and play a leadership role in my organisation in developing the research capability needed to address issues of climate, biodiversity decline, water and food security, and energy transitions. Based on this experience, I see a manifest need for increasingly effective engagement by researchers in integration and implementation across a range of public policy domains. We do have strong understanding of many of the ways in which we use our natural resources and interact with the environment and therefore of consequent drivers of unsustainability. Nevertheless, with our tightly coupled global system undergoing often exponential change, every useful action or decision to address these issues, no matter how good, contains the seeds of the next problem. Cross-sectoral sustainability dynamics therefore result in policy conundrums for government, industry and community that are increasingly obvious. Organising and conducting the research needed to inform effective public policy on such 'wicked' problems is challenging. My organisation has recognised this and is seeking to develop the integrated sustainability science insights that policy makers need in order to assess not only what a decision can achieve but also the problems it may cause. In doing so, it is clear that disciplinary science is powerful in solving problems but often does not adequately meet implementation needs and is rarely well placed to anticipate the full spectrum of consequent issues or address unknowns. Integrative applied research is therefore critical in enhancing our contribution to changing policy and practice in the way we use resources.

As a consequence, researchers are increasingly expected to play a significant role in integration and implementation. Effective integration and implementation is unlikely to happen by accident. Equally, many of the challenges in integration and implementation in domains as diverse as biodiversity conservation, resource use transitions and public health policy will have much in common. This makes the prospect of a rigorous and collective approach to integrative applied research and an underpinning 'I2S' appealing. So, as someone whose research has always been at the boundaries of disciplines, who has always worked in applied domains and who has played roles in research leadership and management and

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<sup>1</sup> Daniel Walker was invited to contribute as a 'research leader whose organisation grapples with complex real-world problems requiring research integration and implementation. Your comments on whether the ideas in this book could enhance your organisation's ability to undertake such research would be very pertinent.'

continues to wrestle with the role of research in addressing sustainability issues, the challenge articulated in this book resonates with me. And yet in reading the draft, I have had a number of questions about the concept of I2S. Does it make sense to talk of I2S as a disciple? Is I2S viable as a discipline? Would I2S be a useful discipline?

## **Is I2S Really a Potential Discipline?**

In the most generic sense a discipline is a field of study. This book makes a compelling case for the common ground in integration and implementation across a range of domains and, therefore, the opportunity for a field of study to transcend those boundaries. The analogy with statistics, in this sense, works well.

Nevertheless, most of the discussion in the book focuses on the practice of integration and implementation, on integration and implementation as praxis rather than study. This is appropriate given the need for better integration and implementation in practice. Nevertheless, the study of the phenomena of integration and implementation (as opposed to practising integration and implementation) will provide the basis for I2S as a discipline and this is contingent on the prospect of an emergent set of axioms and theory.

So it is both meaningful and useful to propose I2S as a potential discipline—the subject matter and questions exist—but I2S will need to develop a theoretical and methodological core if it is ultimately to be called a discipline. Moreover, as discussed below, I2S will need to be able to demonstrate that the effective practice of I2S is at least in principle contingent on reference to underpinning theory—in other words, that I2S is a matter of science (in the sense of the systematic application of knowledge) as well as art (in the sense of the application of experience and creativity). The development and application of any discipline require both.

## **Is I2S Viable as a Discipline?**

I2S is naturally and appropriately the domain of systems thinkers. I call myself a systems thinker, as are almost all the people I work with. We distinguish ourselves from those who take a reductionist scientific approach and argue the merits of systems perspectives for many questions. Nevertheless, I do recognise that a natural tendency to seek to be too all-encompassing to enable tractable research is a real problem in systems-based approaches. To be viable as a

discipline, I2S needs to not only generate a core set of methods and theories but also be sufficiently distinct from other disciplines in terms both of theory and methods and of subject matter.

The preliminary boundaries of I2S articulated in this book encompass core concerns for many other disciplines (such as the many manifestations of planning and management as meta-disciplines), emergent fields of study (such as the ‘science of team science’) and domains of practice in integration (multi-, inter- and trans-disciplinary research approaches, for example, as well as action research). This book articulates the important points of difference with discussion around multi- and trans-disciplinary research but does not yet map I2S in the full firmament of other relevant approaches. Clearly, the contest of ideas is not only healthy but is fundamental to innovation. Nevertheless, addressing the place of I2S will be critical in assessing its viability; it will only be viable if it achieves an adequate ‘share of voice’ both in theoretical and methodological dialogue and in practice, and will only do that if it articulates a real point of difference. It would be better still if a new discipline of I2S succeeded in subsuming subordinate or related constructs and helped rationalise the terminology in overlapping areas of inquiry. Only time will tell.

## Would I2S be a Useful Discipline?

Integration and implementation are matters of process and practice. The value of I2S as a discipline is therefore contingent on its ability to understand these phenomena systematically, to provide a theoretical basis for improved practice and to thereby improve practice. The question then is, to what extent is effective integration and implementation constrained by inadequate theory and methods? This will be a core issue in establishing I2S as a field of study, so at this stage I can only speculate, as follows.

Effective statistical analysis is clearly contingent on theory and methods (theory drives practice and practice tests theory), which is why the analogy between I2S and statistics is beguiling; however, statistics as a discipline is only one analogy and others suggest different conclusions. Leadership is a legitimate field of study (I wasn’t surprised that a quick Google search brought up a *Journal of Leadership Studies*), but I suspect that the impact of leadership studies on leadership in practice is substantially more limited than the impact of statistics as a discipline on applied statistical analyses. Arguably, leadership is more art than science. Indeed, there is a growing industry in leadership development, coaching and training but, observationally, this industry draws on experienced practitioners more than theoreticians. If the balance between ‘art’ and ‘science’ in I2S is more akin to leadership than statistical analysis, is it useful to think of and develop I2S as a discipline?

So what might we expect of the dynamic relationship between I2S theory and methods and integration and implementation practice? Figure 32.1 neatly captures the relationship between a core of 'theory and methods', 'methodological development with respect to a sector' and 'application in a specific sector'. The acid test of the utility of I2S as a discipline will be the relative effort expended on each of these methodological layers and how tightly coupled they are. If the relative effort decreases substantially from 'application in a specific sector' through 'methodological development with respect to a sector' to 'theory and methods', and information flows only in this one direction then, notwithstanding the deep importance of integration and implementation in practice, I2S has little useful contribution to make as a discipline. If relative effort is more balanced and information flows strongly in both directions then I2S will be a demonstrably useful discipline. (If information flows dominantly from 'theory and methods' through 'methodological development with respect to a sector' to 'application in a specific sector' then the discipline would run the risk of being a self-referential dogma. This seems hard to conceive of in relation to I2S.)

## I2S Researchers and I2S Practitioners

The case for I2S is based on the need for better integration and implementation in research across a broad range of research and policy or practice domains and the view that it will not happen, or will not happen effectively, without specialist attention. So, is I2S an inevitable consequence of this need?

The alternative perspective is that existing disciplines in applied domains need to be more competent in integration and implementation. In other words, that there is an increasing para-professional requirement of researchers to be engaged in integration and implementation and therefore for disciplines to be engaged in addressing their interface with other disciplines and with the world of implementation as well as their core areas of inquiry.

Of course, setting these two views up as being mutually exclusive is rhetorical rather than realistic. In practice, it seems unlikely that anyone would argue the case for integration and implementation practice being the exclusive domain of a cadre of I2S specialists. Equally, while we might increasingly expect many scientists to be paying attention to matters of integration and implementation to ensure the relevance of their research, it is easy to see how they would benefit from interfacing with serious and specialised theory and practice in I2S. This might also unwind a growing proliferation of different terms for talking about the same phenomena and practices—a regular Tower of Babel—in linking science and society.

So the case for I2S as a discipline centres on the interplay between theory and practice in integration and implementation; however, there is something of a paradox in conceiving of a new discipline to help achieve integration across disciplines and between disciplines and application that is needed because of the tendency of disciplines to become self-referential. In short, the consequences of applying a core tool of institutionalised research ('the discipline') to addressing a problem that that tool has created are worth paying attention to. An I2S research community could make effective contributions to increasing collective competence in integration and implementation but only if it avoids becoming self-referential.

Having thought about some of the issues that need to be addressed in furthering the case for scholarly investigation of integration and implementation challenges, it is also worth briefly canvassing questions around the development of a growing pool of specialist I2S practitioners. Is it feasible and appropriate to delegate the substantial challenges of integrating disciplines and research into practice to a cadre of I2S specialists? What are the potential costs of doing so in terms of the broader reintegration that is required? Integration and implementation effort across the full range of stakeholders (within disciplines and in the implementation space) in complex public policy issues is, empirically, extremely challenging. But what new dynamics (for better and for worse) will such specialists introduce into the practice of integration and implementation?

## Moving Forwards

This book provides foundational arguments for I2S as a legitimate, viable and useful discipline. Nevertheless, in my view, further consideration is needed in relation to each of these questions, as outlined above. My Big-Science project would seek to: i) further articulate a foundational methodological and, better still, theoretical core to I2S, ii) position that core in the context of other relevant disciplines/discourses and demonstrate uniqueness; and iii) demonstrate the operational value of that postulated core theory and methods in the practice of integration and implementation across a range of domains.

I don't know whether articulation of core theory and methods should take a grounded approach—starting from review of a diversity of case studies—or be built from first principles and then 'tested' against existing case studies. I have no doubt though that the final step of testing the operational value of that core content needs to take an empirical and comparative approach with new projects across multiple domains. Given the large number of integrated applied research projects being funded across many domains this is eminently achievable and would certainly constitute 'big science'.

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## Brief Biography

Dr Daniel Walker is a Deputy Chief of CSIRO's Division of Ecosystems Science. The division comprises some 500 staff with expertise in ecology, agricultural and forestry systems sciences, social and economic sciences, environmental biotechnology and urban infrastructure and engineering at 18 laboratories across Australia. He plays a leadership role in systems-oriented research on the environmental, economic and social dimensions of sustainable production and consumption in Australia's urban centres, agricultural, forestry and rangelands landscapes as well as management of our conservation estate. He is also an Editor-in-Chief of the international journal *Agricultural Systems*. He joined CSIRO in Townsville in 1994 and worked on regional sustainability and development issues in northern Australia including work with the sugar industry and regional planning and management in Australia's savannahs. He moved to Canberra in 2004 and is a graduate of the Australian Rural Leadership Program. Before joining CSIRO, he worked on research to better integrate local knowledge systems into research, and development and evaluation programs in agroforestry in the developing world. This included substantial work in Sri Lanka, Thailand and Nepal.

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