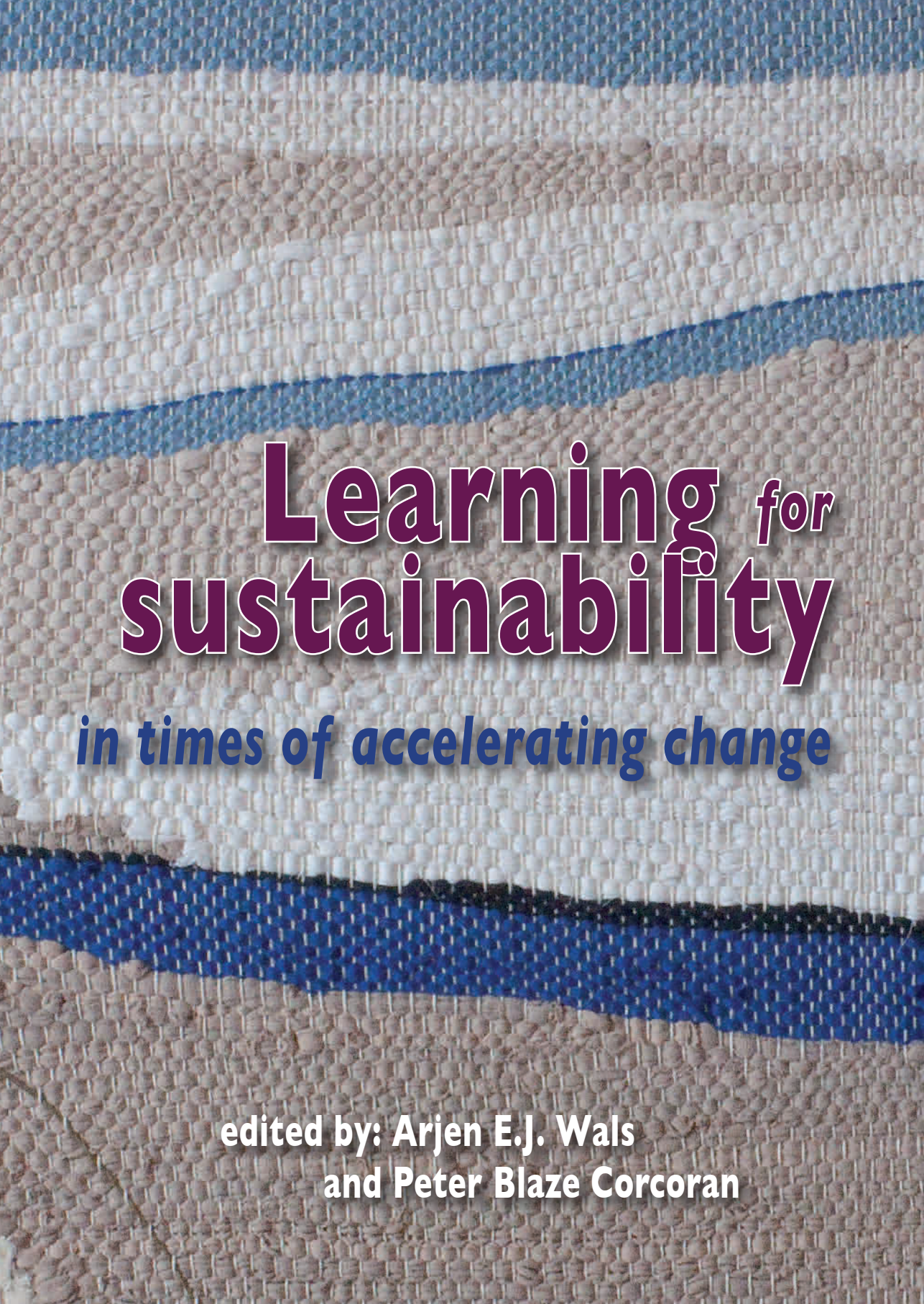
Learning for sustainability
in times of accelerating change
edited by: Arjen E.J. Wals
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Wageningen Academic
P u b l i s h e r s

ISBN: 978-90-8686-203-0
eISBN: 978-90-8686-757-8
DOI: 10.3920/978-90-8686-757-8

Cover art: "Handwoven Waddensea Landscape" by Marijke van der Maarel

First published, 2012

Table of contents

DOI: 10.3920/978-90-8686-757-8_00

Re-orienting, re-connecting and re-imagining: learning-based responses to the challenge of (un)sustainability

Arjen E.J. Wals and Peter Blaze Corcoran

> Change of all kinds – in the biosphere (nature as a whole), the technosphere (the entirety of human manipulation of nature) and the noosphere (the collective field of human consciousness) – is happening so rapidly that it exceeds our capacity to understand it, control it or respond to it adequately in corrective ways.
>
> (AtKisson 2011, p. 300)

The speed of change in the world, physically, socially, and culturally, is accelerating. Throughout history change has inevitably occurred but in today's world change seems to occur at a lightning speed due to, among other things, simultaneous and mutually reinforcing globalization and digitalization. This is affecting how we think, what we know, who to believe and how we act. It is also dramatically changing the role of science in society. Science is no longer the authority of truth, if ever it was. Rather, science oftentimes represents just another point of view or an opinion in the public debate of controversial and ambiguous issues. Scientists can be found on different ends of the spectrum, although on one end more of them might be found than on the other (cf. the debate on climate change). It is not easy to decide who is right, who is wrong or who is more right than others. This difficulty is compounded by the enormous amount of information we can access. As a consequence of this revolution in information and communication technologies (ICTs), we now live in a world where information surrounds us everywhere. However, as E.O. Wilson points out, the availability of information does not automatically lead to more wisdom. In Wilson's words 'we are drowning in information but starving for wisdom' (Wilson 1998, p. 300). When we try to address key inter-related challenges of our time, it is above all wisdom that we need.

One question that concerns us as editors of this book is how the rapid changes occurring to us and to the planet impair our ability to respond to urgent sustainability challenges. Framed as a positive question, how we can take advantage of some of the emerging socio-ecological movements, forms of learning and technological tools, in creating what we might call sustainability wisdom?

The 1972 United Nations Conference on Human Development held in Stockholm, Sweden, gave a boost to the field of environmental education (EE) (UNEP 1972). This field emerged out of nature study and conservation education and was inspired by seminal works like Rachel Carson's *Silent Spring* (1962) and the *Limits to Growth*' report of the Club of Rome (Meadows *et al.* 1972). The 1992 United Nations Conference on Environment and Development (UNCED), also known as the Earth Summit, gave rise to education for sustainable development (ESD) (United Nations 1992). Without discussing the different interpretations of both 'planetary educations' and the way they relate (for such a discussion see: Wals 2009), we can say that both EE and ESD consider education and learning as a key in re-orienting lifestyles, communities and, ultimately, societies and the values on which they are based, in a direction that will allow the planet to go on indefinitely with human beings as permanent inhabitants among many other species.

This book appears 40 years after Stockholm and 20 years after Rio. Forty years have shown incredible progress, but also inertia and decline. *Progress* when using technological advancement, economic growth, agricultural productivity, access to education and the cleaning up of air and water in many parts of the world as indicators. *Inertia* when considering things like access to clean drinking water, improving quality of education, and eliminating war, conflict and ethnic tension. *Decline* when considering the management of natural resources, achievement of social justice and economic equity, protection of global ecosystems, and the preservation of cultural diversity.

Indeed, there are other measures of progress, inertia and decline that can be used to describe the 'development' that has taken place in the last 40 years. The lens one uses frames whether something is considered 'progress' or 'decline'. Take access to clean drinking water as an example. Over 50 years ago, the United Nations set the task of providing access to clean drinking water for all the world's citizens before the year 2000. At the time one billion people did not have such access. In 2012, approximately 900 million people arguably do not have access to clean drinking water (UNICEF/WHO 2008). Some will argue that no matter where you are, you can always buy bottled water. However, this is not what was meant by 'access to clean drinking water'. An optimist might say that even though there are 900 million people without such access, this is still progress as today we have 7 billion people living on the planet, whereas 50 years ago we had around 3 billion people when almost 1 in 3 people did not have access to clean drinking water (today less than 1 in 7).

But there's another way of looking at this: in less than 10 years' time cell phones and wireless networks have made their way into virtually every corner of the globe. From the heart of Burundi to places above the Arctic Circle, people use cell phones.

In fact, in some of the poorest communities around the globe people spend the little income they have on 'feeding' the phone. There is anecdotal evidence that the cell phone has become such a prestigious status symbol that feeding the phone comes before feeding the children. Why is it that companies and governments have succeeded in spreading these technologies so rapidly all over the world, while they have been unable to provide access to clean drinking water for all? The answer, at least in part, lies in the way our economy works. Making money and serving private or corporate interests tends to trump public or community interests. The single bottom-line of profit far outweighs the other two 'Ps' in the increasingly popular triple bottom-line of people, planet and profit (Elkington 1998).

Part of the difficulty in addressing unsustainability lies in the complexity, power dynamics, rhetoric and uncertainty that surrounds sustainability issues. Was the Deepwater Horizon oil spill in the Gulf of Mexico a major ecological and economic disaster? Or are the ecosystems rapidly self-healing and is the regional economy getting back on its feet again? How bad is or was the tsunami-induced nuclear disaster in Japan, really? Will increasing palm oil production and the percentage of biofuel accelerate the loss of rainforests and biodiversity or do they represent a crucial step towards a 'bio-based' economy? Can organic food production feed the world? Or might we be more successful in doing so with genetically modified crops? Is there such a thing as a climate neutral building? How sustainable is solar energy when the resources needed to make photovoltaic panels are finite? These are just a few questions for which there are no simple answers or single truths. And even when we may have no doubt about the severity of the disasters referred to above or about what needs to be done, there will always be others who disagree. Those 'others' might be a small minority, but in today's hyper-connected world even small minorities can reach enormous audiences and receive equal or greater attention from the media. Furthermore that small minority might also find scientists who can and will back up their position. Finally, sometimes small minorities turn out to be right in the end, and silencing minorities is highly problematic and undesirable from a deep democracy perspective which is often seen as integral to sustainability. To make things even more complicated, what seemed to make sense yesterday, makes less sense today and may make no sense at all tomorrow. Insights change as time moves on. It is no surprise that we hear political and business leaders alike say 'Had we had the knowledge of today we would have acted differently back then.'

In this book, the possibilities and dilemmas of designing, strengthening and facilitating learning-based change and transitions towards sustainability are explored. Many of the 31 chapters introduce and discuss (re)emerging forms of learning that assist in breaking down unsustainable behaviours, forms of governance, production and consumption. They also suggest ways to create more

sustainable lifestyles. Examples of such learning are learning by doing, social learning, transformative learning, cross-boundary learning, service-learning, and learning from nature, some of which are featured in this book. Finally, the book also explores questions like: What role do uncertainty and complexity-related emotions such as stress, anxiety and fear play in this context? What kind of capacities, qualities and competences do we need to strengthen in people to be able to live well within the carrying capacity of the earth?

This book attributes a key role to learning as a response to sustainability challenges. It explores the implications of living in times of accelerating change for learning and how new forms of learning can help people in re-orienting society towards sustainability. How do citizens handle 'sustainability confusion' about who is right or who is wrong? Who should citizens believe and not believe about how bad or good things are, and about what to do or not to do in a particular situation? More importantly perhaps, how do we deal with contradictions and the rhetoric oftentimes used to advance a particular interest or perspective? Living in times of uncertainty, complexity, contestation, and in times of technologically-mediated hyper-connectivity and information overload, inevitably has consequences for learning in all settings. But what are these consequences? What kinds of competences and qualities need to be developed in learners to handle them? How can they be developed?

These questions require reflection on what it means to be sustainable and what kinds of personal and collective qualities need to be strengthened to enable people to contribute to a more sustainable world. Increasingly the idea of 'sustainability competence' (Barth *et al.* 2007, Wals 2010) is used to refer to qualities like: thinking in a forward manner (anticipatory thinking), seeing relationships and interdependencies (systems thinking), the ability to put yourself in the mind of others, even other species, having different backgrounds or living elsewhere (empathic understanding and open-mindedness), utilizing diversity towards creativity, and coping with uncertainty. It should be acknowledged here that there may be different capacities needed for a child growing up in poverty in Bujumbura, Burundi than a child growing up in Wageningen, the Netherlands or on Sanibel Island, Florida where the editors of this book live. The challenge of sustainable development is not the same all over the planet but is rather context-dependent: whereas, for instance, sustainable growth might be the challenge in Bujumbura, Burundi, the challenge in Wageningen and on Sanibel Island might be 'sustainable contraction' (Selby 2010), at least for some.

The questions raised in this book cannot be answered without also considering other processes currently taking place in society that are moving us towards *un*sustainability. The process of economic globalization and the hyper-

consumption needed to fuel continuous growth are quite strong. It is estimated that 500 billion US dollars is spent on advertising in the world annually (Nielsen Company 2011). The money spent annually on accelerating sustainability might be growing across the globe but it is still a drop in the ocean by comparison. In other words, the drive to consume in today's world is 'infinitely' greater than the drive to sustain. Re-orienting the economy must be part of the quest for a more sustainable world but there too might be a role for education and learning. Indeed the 'green economy' appears to be booming these days. There is a modest but growing undercurrent that suggests that ultimately a transition towards sustainability will not be the result so much of 'doing things better' by optimizing our current hegemonic systems but rather demands 'doing better things'. The latter requires more fundamental changes in the manner in which we live, work and spend our leisure time, and on the kinds of values that we pursue (Schor 2011; Wals and Schwarzin 2012).

In other words, sustainable development concerns system innovations that require an integrated redesign of products, lifestyles, processes, and structures (Schor 2011). This paradigmatic 'whole system redesign' perspective (Sterling 2004) is increasingly supported by economists (McKibben 2007) as well and by emerging strands within economic sciences such as industrial ecology and ecological economics. Hence, this book also contains chapters that explore ways to engage people, organizations and communities in these more fundamental transitions. The Earth Charter (2000), referred to by Yunhua Liu in the re-connecting part of the book, speaks to these fundamental changes by articulating ethical principles for a just, participatory, and peaceful future. In business, some economists and companies are beginning to develop models and cases based on 'dynamic-equilibriums' rather than on continuous growth and where the maximization of meaning for both workers and customers is replacing the maximization of profit as a key driver.

There are some signs that at least hint at the beginning of a more fundamental shift. At least there is a world-wide increase of interest in ideas like: 'sustainability', 'triple bottom lines of people-planet-profit', 'the greening' of virtually anything, and 'corporate social responsibility' in the world of business and industry. These ideas put the concerns of many environmental and sustainability educators on the agenda of groups that, before Rio, tended to dismiss them. Of course, some question the underlying motives of those who have newly adopted these concepts: are we witnessing forms of 'green washing' and 'feel-good sustainability' that leave intact inherently unsustainable routines and systems as Adrian Parr (2009) suggests? Or, is this the beginning of a major shift or transition towards a more just, fair and, indeed, sustainable world that does not rely on consumerism, growth, and materialism but (re)discovers humanism, dynamic equilibriums, and spirituality?

Finally many of the questions raised in this book inevitably have normative underpinnings. We can develop people's capacities to deal with complexity, uncertainty, considering and utilizing diversity and so on, but what keeps them or the companies hiring them, from using those capacities to maximize material lifestyles and associated corporate profits? Many of these sustainability competences can also become generic competences that can be used in ways that accelerate *un*sustainability. This reminds us of David Orr's observation that without critical reflection on the ends of education, we will become 'more effective vandals of the Earth' (Orr 1994, p. 5). It can be argued that most education around the world today focuses on preparing people for playing their roles in the global economy. Only at the margins of education are there still spaces for things like citizenship, democracy, arts, and humanities, philosophy, ethics, change and transformation. Martha Nussbaum's book, *Not-for-profit* (Nussbaum 2010), points out the consequences of using business models for organizing education and privileging private and economic interests in public education. In the process, education unintentionally contributes to *un*sustainability. Orr points out that the people with the largest ecological footprint are not those 'deprived' of formal education but those with BSc's, MSc's, BA's, MA's and PhD's. In other words, the normative underpinnings of what we do, the values that we live by or are made to live by, need to be reflected on and questioned with 'Earth in mind' (Orr 1994).

Arguably, the current unsustainability crisis is above all a crisis of values, coupled with a lack of imagination and creativity. It is not surprising that there are counter movements rising such as the 'transition town movement' (e.g. Connors and McDonald 2011) and the occupy movement (Toynbee 2011) that are looking for alternative economic models and forms of governance. These movements oftentimes attract organizations and groups of people that are looking to re-connect with nature and to re-discover the potential of nature in guiding humanity towards sustainability. Likewise, the Earth Charter provides ethical values for sustainability and suggests 'fundamental changes are needed in our values, institutions, and ways of living ... Our environmental, economic, political, social, and spiritual challenges are interconnected, and together we can forge inclusive solutions' (Earth Charter 2000, Clugston 2010).

Clearly, humanity is facing problems and challenges for which there are no ready-made solutions that can be confidently prescribed and universally distributed. Some scholars argue we are living in 'post-normal times': times loaded with uncertainty, contested (scientific) knowledge and high levels of complexity where traditional fact-value distinctions are no longer tenable (Funtowicz and Ravetz 1993).

> The traditional fact/value distinction has not merely been inverted; in post normal science the two categories cannot be realistically

> separated. The uncertainties go beyond those of the systems, to include ethics as well. All policy issues of risk and the environment involve new forms of equity, which had previously been considered 'externalities' to the real business of the scientific-technical enterprise, that is the production and consumption of commodities. These new policy issues involve the welfare of new stakeholders, such as future generations, other species, and the planetary environment as a whole...
>
> Only a dialogue between all sides, in which scientific expertise takes its place at the table with local and environmental concerns, can achieve creative solutions to such problems, which can then be implemented and enforced. Otherwise, crude commercial pressures, inept bureaucratic regulations, or counterproductive protests will dominate, to the eventual detriment of all concerned.
>
> (Funtowicz and Ravetz 1993, p. 751)

In post-normal times conventional routines and systems no longer seem to work effectively, not in business, governance, resource management, science, communication, education nor in any other domain or field. A rethinking of these routines and systems and a creative co-creation of alternative ones appears essential in moving towards a more sustainable world. Röling and Wagemakers (1998) pointed out that facilitating and pursuing sustainability is not just a scientific and technical process, but also one that involves complex ethical, philosophical, and political dimensions. As such, it requires an embrace of epistemological pluralism that engages multiple ways of knowing and multiple forms of knowledge. With this book, we hope to provide some easily accessible entry points for the creation of sustainability-oriented 'learning configurations' involving a pluralism of actors and ideas that might be generative in post-normal times.

Like its two predecessors in this series of books on education and learning in the context of sustainability – *Social learning towards a sustainable world* (Wals 2007) and *Young people, education, and sustainable development: exploring principles, perspectives, and praxis* (Corcoran and Osano 2009) – this book consists of three parts. In this case, re-orienting science and society in light of unsustainability, reconnecting people and planet and, re-imagining education and learning. Unlike the other two volumes in the series, these three parts were not pre-determined but rather emerged organically out of the responses the call for contributions to this book generated. In fact, much of this book was not pre-determined other than the general theme of 'learning for sustainability in times of accelerating change'. Using our networks and social media, we launched the theme and the request for contributions around the globe and waited one month to see what would come in.

We received almost 80 abstracts from all over the world, from emerging scholars to more established ones, from more conceptually-oriented people to more practice-oriented ones. Out of these 80 abstracts, the editorial-team selected just fewer than 50 that we felt were the most promising in meeting the high expectations we had of this book. We received over 40 draft chapters. After a double review process involving the editors, the assistant-editors, and the peer authors in this volume, we arrived at 31 final chapters. We divided these into three parts: re-orienting science and society, re-connecting people and planet and re-imagining education and learning.

In Part I, *Re-orienting science and society*, the authors address the changing relationships between science and society that are the result of what we have called 'post-normal' times. With science no longer being the authority of truth and often-times representing just another opinion in the public and political debate, universities and academics are looking for ways to participate in these debates in ways that restore some of the trust and credibility which has been lost. There are also emerging strands of science that show some humility with respect to knowledge creation in that they recognize that there are multiple ways of knowing and that finding adequate responses to sustainability challenges require knowledge co-creation between multiple societal actors.

Again we refer to Funtowicz and Ravetz, who as early as 1993 observed that:

> When problems lack neat solutions, when environmental and ethical aspects of the issues are prominent, when the phenomena themselves are ambiguous, and when all research techniques are open to methodological criticism, then the debates on quality are not enhanced by the exclusion of all but the specialist researchers and official experts. The extension of the peer community is then not merely an ethical or political act; it can positively enrich the processes of scientific investigation. Knowledge of local conditions may determine which data are strong and relevant, and can also help to define the policy problems. Such local, personal knowledge does not come naturally to the subject-specialism experts whose training and employment predispose them to adopt abstract, generalized conceptions of genuineness of problems and relevance of information. Those whose lives and livelihood depend on the solution of the problems will have a keen awareness of how the general principles are realized in their 'back yards'. They will also have 'extended facts', including anecdotes, informal surveys, and official information published by unofficial means. It may be argued that they lack theoretical knowledge and are biased by self-interest; but it can

> equally well be argued that the experts lack practical knowledge and have their own unselfconscious forms of bias.
>
> (Funtowicz and Ravetz 1993, p. 752-753)

The involvement of multiple stakeholders in the co-creation of solutions to sustainability issues requires high levels of participation, new pedagogies, ethical deliberations and forms of social learning. In Part I there are chapters on each of these essential elements that, when combined, can lead to communities that are more reflexive and, indeed, more resilient and more 'anticipatory' in responding to set-backs and sustainability challenges. But, as some argue, more will be needed, as we cannot move towards sustainability when we fail to see the mechanisms, oftentimes socio-economic in nature, that contribute to unsustainability. Learning for sustainability also requires a bold exploration and confrontation of these mechanisms. John Huckle, in his chapter, argues for realistic learning for sustainability that can help the disinterested and disenchanted in today's world understand their situation and that of others, foster solidarity, and offer viable futures. Otto and Wilkinson in their contribution offer time-travel narratives as a valuable tool in learning from the past in creating such viable futures. This can be read as commentary on the limits of technological rationality and on the need to find other ways of effecting environmental and social change. Weakland adds to this that our response must not be to reject technology, but to engage actively and critically in the specific forms of our coexistence with technology – individually, globally, and, indeed, at a planetary scale, as well. He suggests that such a response may require letting go of an integral, organic body that opposes itself to intimacies with machines which will allow us to see how we are webbed in technological networks from which we cannot extricate ourselves.

In Part II, *Re-connecting people and planet*, the contributing authors explore ways to restore our relationship with the social and physical world both of which are eroding in times of accelerating change and in ICT-mediated landscapes. This declining ability to connect meaningfully with others and 'the other' impairs our imagination, empathy and solidarity. Although it can be argued that the proliferation of ICT technologies and the resulting interconnectivity altogether challenge the traditional notions of 'place' altogether the chapters introduce a range of processes and means that can help in restoring the connections between people and between people and planet, including arts-based methods, relationship-based experiential learning, transformative learning, exploring indigenous and traditional knowledge, meaningful relatedness, and reflective and spirited practices. Some authors also emphasize the cultivation of hope in a world of 'environmental catastrophe' while others emphasize the value of slowing down in times of accelerating change as a stepping stone for reflection.

The contributors to this part of the book consider a deeper understanding of 'place' crucial in our quest for sustainability. Many of the chapters echo what scholars like David Sobel and Greg Smith have consistently argued: that place-based forms of learning can help people, young and old, to re-connect with the physical and socio-ecological world that they increasingly unknowingly and unconsciously inhabit. Several of the chapters in this part of the book suggest that (re)discovering and (re)connecting with place can be restorative (therapeutic, healing, etc.), generative (leading to new ways of seeing, sensing and experiencing) and empowering, by enabling people to shape and care for a place. There are a number of psychological, sociological and pedagogical benefits associated with place-based education (Sobel 2004, Smith and Greenwood 2008, Smith and Sobel 2010).

Part III, *Re-imagining education and learning*, is in some ways the most practice oriented in the sense that it contains a number of practical examples of transformative practices in teaching and learning that are based on principles outlined in Parts I and II. The opening chapter bridges Parts I and III by asking the question of how to handle the uncertainty that marinates sustainability issues. More specifically, how can educators help children handle such uncertainty? Some of the chapters in this section zoom in on specific sustainability challenges like responding to climate change, energy use, the tragedy of the commons, and engaging youth in sustainable urban planning. There are a number of chapters looking at the simultaneous reconfiguration of curriculum and school-community relationships using sustainability as a catalyst. Some learning from success, others learning from 'failure'. Again others highlight new forms of learning such as the use of global storylines as transformative ecological learning, frameworks-based education and learning through controversy.

The chapters form a dynamic landscape that will change over time just as the reader will change. There is no one preferred route to take and the landscape can be entered from different points. Readers can weave their own journey and determine for themselves the significance of their encounters. This brings us to the cover art used for this book: a hand-woven landscape by Dutch artist Marijke van der Maarel. The landscape represents the 'Waddensea' located in the north of the Netherlands. It is an ecologically rich and dynamic landscape, with islands affected by tidal fluctuations. The landscape is also affected by global ecological changes, including changing weather patterns, oceanic toxicity and rising sea levels. It is a landscape that has also shown high levels of resilience, in part because of responses by islanders, nature conservation organizations, ecologists, policy-makers and, of course, educators. As such, the cover captures much of what this book is about – change, learning and the weaving together of stories that may provide clues for creating the wisdom we need to move towards a more sustainable world.

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